

Chapter 9

Industrial Development

9

INDUSTRIAL DEVELOPMENT

I. INTRODUCTION

9.01 The industrialization strategies of the Sixth Malaysia Plan incorporated the principal recommendations of the Industrial Master Plan (IMP) which emphasized export-led growth through industrial diversification, provision of a liberal investment climate and the promotion of intra-industry linkages. Against this backdrop, industrial development progressed rapidly with the private sector taking the lead role and the Government providing a conducive environment to foster further the development of the manufacturing sector as the leading sector of growth in the economy. During the period, the sector achieved high rates of growth in output, surpassing the target set. This was largely attributed to strong domestic and sustained external demand for the country's manufactured products. With the expansion of the sector, there was a corresponding increase in its contribution to Gross Domestic Product (GDP), employment and export earnings.

9.02 To sustain this high growth, policies and strategies will be formulated in the Seventh Malaysia Plan to accelerate the diversification of industries and develop a more resilient industrial base towards the achievement of Vision 2020. In meeting the challenges arising from increased globalization and continued tightness in the labour market, priority will continue to be accorded to improving the competitiveness of industries through increases in productivity, research and development as well as the provision of adequate supporting infrastructure. A more concerted and coordinated approach will also be undertaken to broaden and strengthen the manufacturing base through the development of capital and intermediate goods industries. Strategies and programmes to further expand and upgrade small-and medium-scale industries (SMIs) will also be actively pursued, in order that they be more effective supporting industries to the larger establishments.

II. PROGRESS, 1991-95

9.03 The manufacturing sector led in contributing to the buoyant growth of the economy with expansion of output in most industries, brought about by the strong demand in both the domestic and export markets. Private investment increased substantially to support the expansion of the sector, reflecting the private sector's confidence in the economy.

Growth Performance by Industry

9.04 Growth in manufacturing output increased at an average annual rate of 13.3 per cent, surpassing the Sixth Plan target of 12.2 per cent. The manufacturing sector was the leading sector in the economy with output accounting for 33.1 per cent of GDP by the end of the Plan period. The non-resource-based industries, as a group, achieved a higher annual growth rate of 18.3 per cent, while the resource-based industries grew at 9.1 per cent per annum, as shown in *Table 9-1*. The high growth of the non-resource-based industries was in line with the world's increasing demand for non-resource-based products, such as consumer electronics, computers and peripherals, which are largely associated with a knowledge-based economy and higher affluence.

9.05 Among the domestic market-oriented industries, the fabricated metal products, basic iron and steel, and non-metallic products industries, registered double-digit growth rates in output of 36 per cent, 15.7 per cent and 12.8 per cent per annum, respectively. The growth of these industries were linked to the robust expansion of the construction and manufacturing sectors as well as the implementation of infrastructure-related projects.

9.06 In the case of export-oriented industries, the electrical and electronic products, rubber products, textile and wood products industries, continued to be the leading subsectors. The strong growth performance of the electrical and electronic products industry, with a growth rate of 19 per cent per annum, was mainly attributed to the large increase in production and demand for refrigerating and air-conditioning machinery, as well as radios and television sets. Demand for these products increased in export markets such as the United States, Singapore, Japan and the People's Republic of China as well as in the domestic market because of higher consumer purchasing power.

TABLE 9-1

GROWTH OF MANUFACTURING INDUSTRIES, 1990-95

<i>Industry</i>	<i>Value Added (RM million in 1978 prices)</i>		<i>Share of Value Added (%)</i>		<i>Average Annual Growth Rate, 1991-95</i>
	<i>1990</i>	<i>1995</i>	<i>1990</i>	<i>1995</i>	<i>(%)</i>
Resource-Based	12,482	19,288	58.5	48.4	9.1
Food Manufacturing	1,106	1,680	5.2	4.2	8.7
Oils & Fats	1,610	1,773	7.5	4.5	1.9
Beverages Industries	436	489	2.0	1.2	2.3
Tobacco Manufactuirng	501	447	2.3	1.1	-2.3
Wood & Wood Products	1,305	2,226	6.1	5.6	11.3
Chemical & Other Chemicals	3,491	5,671	16.4	14.2	10.2
Industrial Chemicals	2,282	3,485	10.7	8.8	8.8
Other Chemical Products	714	1,259	3.3	3.2	12.0
Plastic Products	495	927	2.3	2.3	13.4
Petroleum Refineries	402	597	1.9	1.5	8.2
Rubber Remilling & Latex	640	676	3.0	1.7	1.1
Rubber Products	1,161	2,516	5.4	6.3	16.7
Non-Metallic Mineral Products	1,664	2,945	7.8	7.4	12.1
Glass & Glass Products	222	311	1.0	0.8	7.0
Non-Metallic Products	1,442	2,634	6.8	6.6	12.8
Non-Ferrous Metal	166	268	0.8	0.7	10.1
Non-Resource-Based	8,858	20,537	41.5	51.6	18.3
Textiles & Clothings	1,458	2,557	6.8	6.4	11.9
Manufacturing of Textiles	857	1,751	4.0	4.4	15.4
Wearing Appârel	601	806	2.8	2.0	6.0
Iron & Steel Basic Industries	665	1,377	3.1	3.5	15.7
Fabricated Metal Products	615	2,863	2.9	7.2	36.0
Electrical & Electronic Products	5,052	12,068	23.7	30.3	19.0
Manufacture of Machinery	343	1,076	1.6	2.7	25.7
Electrical Machinery	4,709	10,992	22.1	27.6	18.5
Transport Equipment	1,068	1,672	5.0	4.2	9.4
Total	21,340	39,825	100.0	100.0	13.3

9.07 Despite the impressive performance of the manufacturing sector, the manufacturing base continued to be dominated by the electrical and electronic products subsector, with a share of 30.3 per cent of total manufacturing value-added in 1995, compared with 23.7 per cent in 1990. However, a positive development in this subsector was the diversification into higher value-added products, leading to the expansion in output of consumer and industrial electronics.

Export of Manufactured Goods

9.08 During the Plan period, exports of manufactured goods grew at an average rate of 25.8 per cent per annum, higher than the Sixth Plan target of 19.8 per cent. The share of manufactured exports to total exports increased from 58.8 per cent in 1990 to 79.6 per cent in 1995. As shown in *Table 9-2*, the principal source of export earnings was the electrical and electronic products industry with a share of 65.7 per cent of manufactured exports in 1995. This indicated Malaysia's niche in the export of semiconductors, electrical appliances and telecommunications products.

9.09 Despite the significance of electrical and electronic products in total exports, analysis of export trends showed that diversification and expansion of the export base has taken place. The export figures indicated that although the contribution of newly emerging export-oriented industries such as transport equipment, chemical and chemical products and furniture remained small, they recorded high rates of growth. This was an encouraging trend, indicating increased investments in these subsectors and the success of marketing in export markets.

9.10 The United States, Singapore, European Union and Japan remained the principal markets for manufactured exports, accounting for 74 per cent of manufactured exports in 1995, as shown in *Chart 9-1*. Singapore continued to be the main market for manufactured exports among the ASEAN countries, amounting to RM32.8 billion or 80 per cent of the manufactured exports. Inroads were made by Malaysian exporters into the Hong Kong and Taiwan markets, with an export value of RM13.6 billion in 1995 compared with RM2.9 billion in 1990, as shown in *Table 9-3*. In addition, manufactured exports to the countries of the South, such as, Brazil, Egypt, Mexico, Nigeria and Papua New Guinea, increased from RM1.4 billion in 1990 to RM9 billion in 1995, indicating the success of Malaysian exporters in penetrating new markets.

TABLE 9-2					
GROSS EXPORTS OF MANUFACTURES, 1990-95					
(RM million)					
<i>Industry</i>	<i>1990</i>	<i>%</i>	<i>1995</i>	<i>%</i>	<i>Average Annual Growth Rate, 1991-95 (%)</i>
Electrical & Electronic Products	26,502.4	56.6	96,885.6	65.7	29.6
Transport Equipment	1,928.0	4.1	5,251.3	3.6	22.2
Food	1,966.1	4.2	3,234.0	2.2	10.5
Beverages & Tobacco	95.3	0.2	395.1	0.2	32.9
Textiles, Clothing & Footwear	3,907.2	8.3	6,473.7	4.4	10.6
Wood & Wood Products	1,347.2	2.9	4,955.3	3.4	29.8
Rubber Products	1,353.8	2.9	3,305.1	2.2	19.5
Petroleum Products	1,285.1	2.7	3,130.3	2.1	19.5
Chemical & Chemical products	1,468.1	3.1	6,323.1	4.3	33.9
Non-Metallic Mineral Products	771.1	1.6	1,677.4	1.1	16.8
Manufactures of Metal	1,576.9	3.4	4,694.6	3.2	24.4
Other Manufactures	4,639.3	9.9	11,198.5	7.6	19.3
Total	46,835.0	100.0	147,524.0	100.0	25.8

9.11 During the Sixth Plan period, continuous efforts were taken both to enhance Malaysia's export performance and gain access to non-traditional markets. In this regard, the Malaysia External Trade Development Corporation (MATRADE), which was established in 1993, provided market information and support to Malaysian exporters through its worldwide network of offices. These efforts were complemented by the establishment of the Malaysian Trade and Distribution Centre in Rotterdam and four General Trading Companies (GTCs). The Malaysian Trade and Distribution Centre was set up to provide a marketing base to sell and distribute Malaysian products direct to buyers in the European market, while the role of the GTCs was to enhance the export of Malaysian products and services, particularly to the countries of the South. The GTCs undertook feasibility studies, fact-finding missions, advertising and setting up of distribution centres in order to promote Malaysian exports.

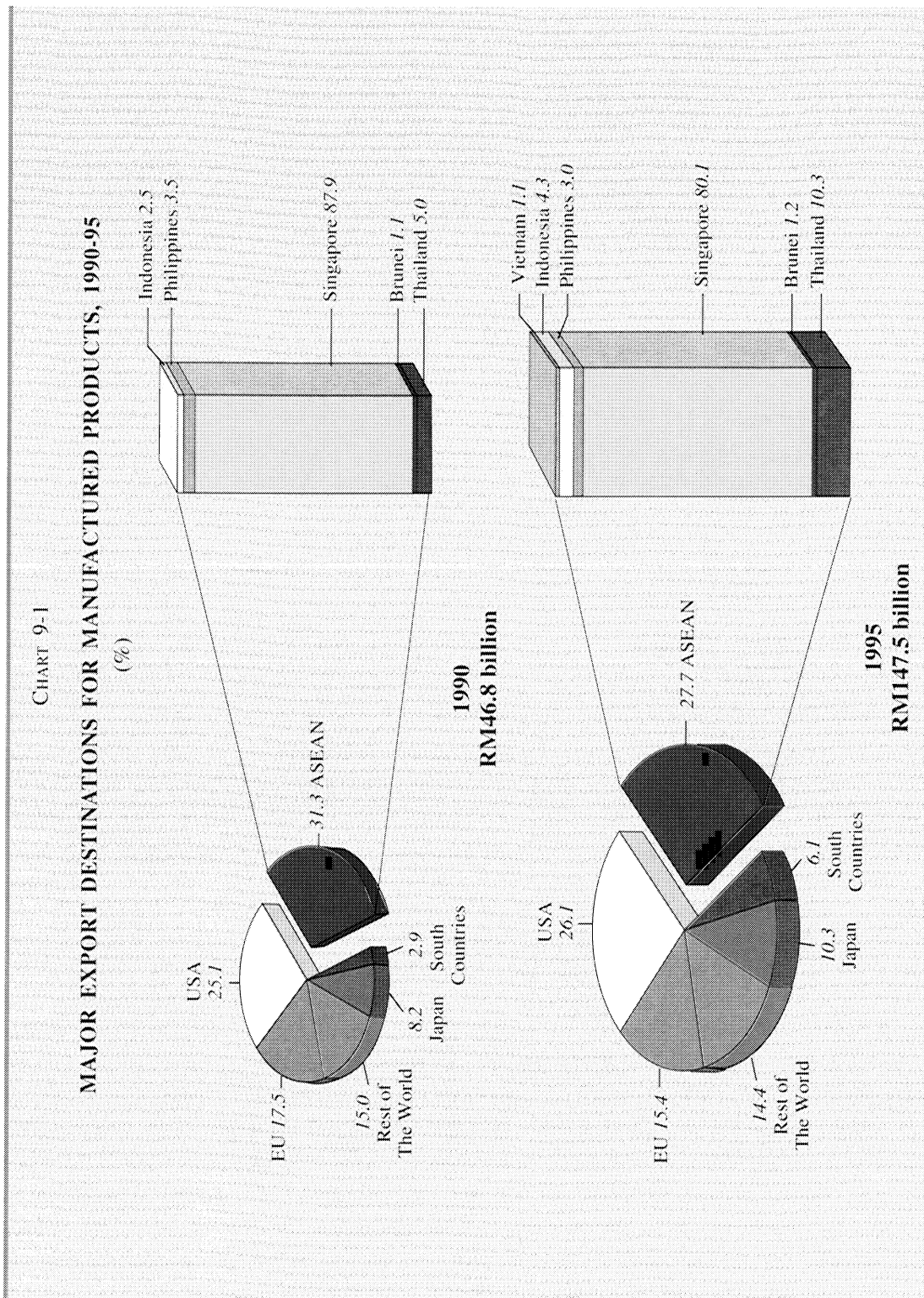


TABLE 9-3					
PRINCIPAL MARKETS FOR MANUFACTURING EXPORTS, 1990-95					
(RM million)					
<i>Country</i>	<i>1990</i>	<i>%</i>	<i>1995</i>	<i>%</i>	<i>Average Annual Growth Rate, 1991-95 (%)</i>
USA	11,756	25.1	38,504	26.1	26.8
Singapore	12,880	27.5	32,750	22.2	20.5
EU	8,196	17.5	22,719	15.4	22.6
Japan	3,840	8.2	15,195	10.3	31.7
Hong Kong	2,248	4.8	9,146	6.2	32.4
Taiwan	656	1.4	4,426	3.0	46.5
South Countries	1,358	2.9	8,999	6.1	46.0
Rest of the World	5,901	12.6	15,785	10.7	21.7
Total	46,835	100.0	147,524	100.0	25.8

Employment in the Manufacturing Sector

9.12 With the rapid growth in the manufacturing sector, demand for labour grew at 9.0 per cent per annum with total employment at 2.1 million by the end of 1995. The sector was the largest contributor in terms of new job creation in the economy. In tandem with the trends in investment and output, the subsectors with high rates of employment growth were the electrical and electronic products, wood and wood products, petroleum refineries, transport equipment, plastic products and fabricated metal products, with growth rates ranging from 10 per cent to 23 per cent per annum.

9.13 The tight labour market experienced during the Sixth Plan period exerted pressure on wages and unit labour costs (ULC). Real wages in the manufacturing sector increased at a faster rate than labour productivity, particularly between 1991 and 1992. As a result, ULC increased by 10.7 per cent over this period. The stabilization of real wages together with increased productivity that started in 1993, moderated the increase in ULC such that by the end of the Plan period, ULC had declined. The measures taken to improve labour productivity included encouraging industries to shift to more capital-intensive production

processes, and retraining and skill upgrading of the workforce through programmes initiated by the Skill Development Centres (SDCs), the Centre for Instructor and Advanced Skill Training (CIAST), as well as the Human Resources Development Council. In addition, to ease the labour shortage in the manufacturing sector, the Government allowed the selective employment of foreign workers.

9.14 Labour demand in the sector, as reflected in the employment data of manufacturing industries showed that demand was highest for unskilled workers. About 34 per cent of demand was for this category of workers and 26 per cent for skilled labour, as shown in *Table 9-4*. The largest number of jobs were for production workers, particularly to cater to the expansion of activities in the electrical and electronic products, wood and wood products as well as fabricated metal subsectors.

9.15 Recognizing that industries need to modernize and shift to more capital-intensive methods of production, the reinvestment allowance incentive was revised to make it more attractive for industries to undertake modernization of plants and equipment as well as to automate production processes. To facilitate this shift, the 1994 Budget increased the reinvestment allowance from 40 per cent to 50 per cent of the capital expenditure incurred by companies for these activities. Using the capital investment per employee ratio as an indicator of capital intensity, it was noted that there was an overall increase in the ratio from RM99,352 per employee, during the Fifth Plan period, to RM183,217 per employee during the Sixth Plan period.

9.16 The private sector's active participation in setting up training centres to conduct industry-relevant courses was encouraged. A total of eight SDCs was established in the states of Johor, Kedah, Melaka, Pahang, Perak, Sarawak, Selangor and Terengganu, while that in Pulau Pinang was expanded. The Federal Government disbursed RM18.9 million in the form of equipment grants and RM5 million soft loan to the centres. While contributions from the state governments included land and buildings, the private sector provided support through cash and equipment as well as instructors. The training programmes, which included courses in industrial automation, plastic mould design, precision machining and computer-aided design, benefitted 17,627 participants. In addition, to encourage the participation of Trade and Industry Associations in skill training, the Government provided a launching grant of RM1.45 million for the establishment of the Malaysian Textiles Centre by the Malaysian Textile and Manufacturers Association. The setting up of these training centres complemented the efforts of public sector training institutions in providing the skilled workers required by industries.

TABLE 9-4

**EMPLOYMENT IN THE MANUFACTURING SECTOR
BY CATEGORY OF WORKERS, 1990-95**

<i>Category</i>	<i>1990</i>	<i>Share (%)</i>	<i>1995</i>	<i>Share (%)</i>	<i>Average Annual Growth Rate, 1991-95 (%)</i>
Managerial & Professional	50,281	3.8	88,219	4.3	11.9
Technical & Supervisory	114,592	8.6	184,644	9.0	10.0
Clerical	88,840	6.7	129,250	6.3	7.8
General Workers	53,620	4.0	63,600	3.1	3.5
Skilled	351,765	26.4	533,416	26.0	8.7
Semi-skilled	209,698	15.7	359,030	17.5	11.4
Unskilled	464,034	34.8	693,441	33.8	8.4
Total	1,332,829	100.0	2,051,600	100.0	9.0

Investment in the Manufacturing Sector

9.17 Private investment in the manufacturing sector was impressive and amounted to about RM84 billion during the Sixth Plan period, exceeding the Sixth Plan target of RM80 billion. As shown in *Table 9-5*, the amount of approved investments totalled RM116.2 billion, representing an increase of 98.3 per cent, compared with the amount approved in the Fifth Plan period. Approved investment in the manufacturing sector declined to RM27.8 billion and RM13.8 billion in 1992 and 1993, respectively, compared with the higher level recorded in 1991 of RM30.8 billion, as indicated in *Chart 9-2*. The unprecedented high level of investment in 1991 was largely due to several capital-intensive projects in the petroleum and basic metal products subsectors. After the decline in 1993, the proposed capital investment rebounded by an increase of 65.9 per cent in 1994, indicating the continued attractiveness of the country as a location for foreign and local investments.

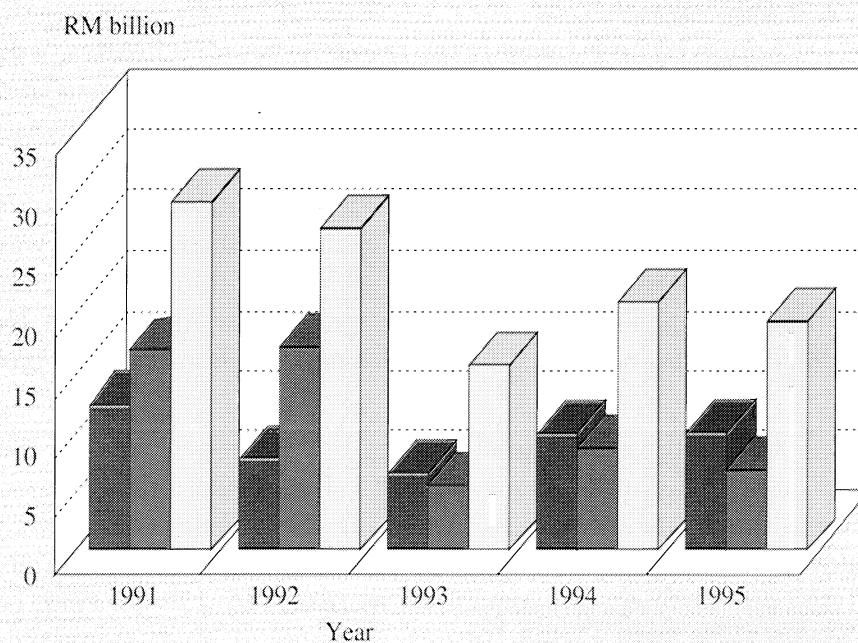
TABLE 9-5

APPROVED MANUFACTURING PROJECTS, 1991-95

<i>Industry</i>	<i>Number</i>	(RM million)		
		<i>Domestic Investment</i>	<i>Foreign Investment</i>	<i>Total Capital Investment</i>
Resource-Based	1,908	33,466.3	34,057.2	67,523.5
Food Manufacturing	216	1,467.2	954.8	2,422.0
Beverages & Tobacco	21	169.9	330.6	500.5
Wood & Wood Products	333	3,887.7	2,942.5	6,830.2
Furniture & Fixtures	182	457.2	355.8	813.0
Paper, Printing & Publishing	150	1,710.9	514.0	2,224.9
Chemical & Chemical Products	271	5,571.8	8,007.2	13,579.0
Petroleum Refineries/Products	18	3,248.3	13,198.6	16,446.9
Natural Gas	2	5,909.0	1,722.0	7,631.0
Rubber Products	149	638.6	470.1	1,108.7
Plastic Products	310	1,358.2	1,020.0	2,378.2
Non-Metallic Mineral Products	256	9,047.5	4,541.6	13,589.1
Non-Resource-Based	2,297	20,863.0	27,318.7	48,181.7
Textiles & Textile Products	311	959.2	3,728.0	4,687.2
Leather & Leather Products	27	76.7	56.7	133.4
Basic Metal Products	182	11,300.6	5,791.5	17,092.1
Fabricated Metal Products	225	1,173.9	2,403.1	3,577.0
Machinery Manufacturing	193	511.3	1,085.7	1,597.0
Electrical & Electronic Products	1,131	3,805.0	12,703.2	16,508.2
Transport Equipment	198	2,995.2	1,321.6	4,316.8
Scientific & Measuring Equipment	30	41.1	228.9	270.0
Miscellaneous	92	236.2	221.3	457.5
Total	4,297	54,565.5	61,597.2	116,162.7

CHART 9-2

INVESTMENT IN APPROVED PROJECTS, 1991-95
(RM billion)



Domestic		14	10	7	12	12
Foreign		17	18	6	11	9
Total		31	28	13	23	21

9.18 In view of the greater competition for foreign direct investment (FDI), the Government launched the Domestic Investment Initiative (DII) in 1993 to encourage a higher level of domestic investment. Strategies under the DII included organizing campaigns and investment promotion seminars locally, encouraging increased domestic content in manufacturing output, strengthening and deepening the local capital market to support domestic investment as well as developing domestic anchor companies and SMIs to provide greater inter-industry linkages.

9.19 The amount of approved domestic investment in 1993 exceeded the approvals for foreign investment by 19 per cent. This was a significant development as foreign investment in the sector had exceeded domestic investment since 1987. With regard to the sources of FDI, Japan, Taiwan, the United States, France and Singapore accounted for 65.8 per cent of total foreign investment approved, as shown in *Table 9-6*.

9.20 Approved investment in the resource-based industries, which accounted for 58 per cent of total investment, was higher than investment in non-resource-based industries. However, if the heavy capital-intensive investments in the petroleum refineries and natural gas industries were excluded, the share of investment in the non-petroleum resource-based industries was only 37 per cent, indicating a downtrend in investment in these industries. This was in line with the global trend in the last 10 years where the growth of non-petroleum resource-based industries had slowed down because of low demand in North America and Western Europe, compared with the demand for non-resource-based industries.

9.21 An encouraging trend during the Plan period was the increase in reinvestment in terms of expansion and diversification of projects, reflecting the commitment of investors in expanding their businesses in Malaysia and the favourable growth prospects of the manufacturing sector. The number of projects involving reinvestment and expansion increased by 228 per cent, compared with that of the Fifth Plan period. In terms of capital investment, there was a six-fold increase from RM4.8 billion to RM29.5 billion, of which about 47 per cent were from foreign sources.

9.22 An analysis of the locations favoured by investors showed that the states of Selangor, Johor and Pulau Pinang continued to receive the largest number of projects, reflecting the pull factors associated with developed industrial regions. A total of 2,121 projects or 62 per cent of the total approved projects were located in these states. In terms of proposed capital investment, Selangor, Terengganu and Johor accounted for 44 per cent of the total proposed investment. The significant expansion of investment in Terengganu was due to the rapid development of the petroleum subsector in the state.

9.23 The banking sector and capital market provided support to the growth in investment in the manufacturing sector. Loans from the banking sector increased at an average annual rate of 17.7 per cent during the period 1991-95 and outstanding loans amounted to RM48.8 billion by 1995. The commercial

TABLE 9-6
FOREIGN INVESTMENT IN APPROVED PROJECTS BY COUNTRY, 1991-95
(RM million)

Country	1991	1992	1993	1994	1995	6MP	% of Total
Japan	3,705.9	2,684.3	1,661.2	1,765.2	2,096.3	11,913.0	19.3
Taiwan	3,607.2	1,500.0	894.2	2,874.3	1,442.2	10,317.8	16.8
USA	1,798.4	3,298.7	1,757.7	1,253.2	1,801.6	9,909.5	16.1
France	27.0	4,066.0	30.8	49.6	97.9	4,271.2	6.9
Singapore	1,114.3	442.4	521.9	1,063.5	1,008.7	4,150.8	6.7
Republic of Korea	1,818.7	99.4	111.1	408.8	604.4	3,042.4	4.9
Australia	410.5	2,125.6	52.1	175.6	139.5	2,903.3	4.7
United Kingdom	546.2	1,304.0	44.1	94.1	189.9	2,178.3	3.5
Indonesia	1,242.9	480.2	245.1	-	88.0	2,056.2	3.3
Hong Kong	600.6	78.6	93.8	873.9	175.2	1,822.1	3.0
Germany	193.3	72.8	64.9	655.4	149.5	1,136.0	1.8
Others	1,990.4	1,620.2	810.4	2,125.3	1,350.3	7,896.6	12.8
Total	17,055.3	17,772.1	6,287.2	11,339.1	9,143.5	61,597.2	100.0

banks remained an important source of financing and provided RM42.3 billion or about 86.7 per cent of the total outstanding loans. In terms of the lending portfolio of commercial banks, loans to the manufacturing sector constituted about 23.2 per cent, of which significant amounts went to the rapidly expanding industries such as the electrical and electronic products as well as wood and wood products, as shown in *Table 9-7*.

Measures to Promote Industrial Development

9.24 During the Sixth Plan period, the Government continued to implement liberal policies to improve the country's investment climate. In this regard, incentives were continuously reviewed with the objective of encouraging the growth and development of competitive industries.

Investment Incentives

9.25 Investment incentives were reviewed with the objective of encouraging investments more selectively, phasing out incentives which were less effective, providing greater emphasis towards achieving higher levels of local content, value-added, technology development and industrial linkages. In this regard, adjustments were made to the pioneer incentives, the reinvestment allowance, the abatement for export performance and the export allowance. To further enhance the investment climate, the corporate tax rate was reduced from 34 per cent in 1991 to 30 per cent in 1995. In addition to the on-going review of fiscal incentives, the provision of non-fiscal incentives was emphasized. These included the provision of infrastructure facilities, human resource development and encouraging R&D.

Industrial Restructuring and Rationalization

9.26 In addition to the Industrial Adjustment Allowance¹, the Industrial Adjustment Fund (IAF) was launched in 1991 to assist industries undertake structural adjustments in order to increase efficiency and competitiveness. The three industrial subsectors identified for industrial adjustment were the wood products, textile, machinery and engineering industries. The programme covered

¹ Incentive under the Promotion of Investments Act, 1986 which provides an allowance of up to 100 per cent in respect of qualifying capital expenditure incurred by manufacturing companies undertaking approved industrial adjustment programmes.

TABLE 9-7

**LENDING OF COMMERCIAL BANKS TO THE MANUFACTURING
SECTOR BY INDUSTRY, 1990-95**

(RM million)

<i>Industry</i>	<i>1990</i>	<i>%</i>	<i>1995</i>	<i>%</i>	<i>Average Annual Growth Rate, 1991-95 (%)</i>
Processing Rubber, Tin & Palm Oil	2,095	11.2	2,758	6.5	5.7
Wood & Wood Products	1,707	9.1	4,339	10.2	20.5
Food, Beverages & Tobacco	1,265	6.7	2,267	5.4	12.4
Paper & Pulp Products	615	3.3	1,276	3.0	15.7
Printing & Publishing	482	2.6	1,106	2.6	18.1
Industrial Chemical	337	1.8	1,034	2.4	25.1
Petroleum Products	206	1.1	325	0.8	9.5
Building Materials	873	4.7	2,009	4.7	18.1
Transport Equipment	912	4.9	1,408	3.3	9.1
Electrical & Electronic Products	2,427	12.9	5,160	12.3	16.3
Metal Products	1,061	5.7	1,792	4.2	11.1
Others	6,762	36.1	18,870	44.6	22.8
Total	18,742	100.0	42,344	100.0	17.7

activities aimed at improving technology, increasing productivity and enhancing the efficient use of natural resources and manpower. However, out of the revolving fund of RM500 million, only RM66 million involving 18 projects were approved by the end of the Plan period. More than 67 per cent of the applications were from the textile subsector indicating the restructuring efforts taken by manufacturers in this subsector to meet the global challenges of this industry. In view of the overall underutilization of the fund, the Government, in the 1995 Budget, merged existing funds including the IAF, into a newly established Domestic Investment Fund (DIF). This RM1 billion fund is aimed primarily at promoting the development of supporting industries, increasing Bumiputera participation in the manufacturing sector, expanding the marketing of Malaysian products as well as enhancing R&D and technology development.

Tariff Policy

9.27 In line with the policy of trade liberalization and towards the realization of the Asean Free Trade Area (AFTA) by the year 2003, the Malaysian tariff structure was revised and tariff rates for a wide range of products were reduced. Under the time-frame for implementation, the target tariff of zero per cent to five per cent in the fast-track programme is expected to be achieved within five to seven years, while the normal track programme will be realized within seven to ten years. The Government held various dialogues with the private sector to reaffirm its commitment to further liberalize tariff items. In this regard, domestic manufacturers have to strive for higher levels of efficiency and competitiveness. The Sixth Plan period also witnessed the introduction of the Countervailing and Anti-Dumping Duties Act, 1993 which incorporated the principles of the Anti-Dumping and Subsidies Code under the General Agreement on Tariffs and Trade (GATT). With the implementation of the Act, Malaysian manufacturers have an effective mechanism against unfair trade practices.

Industrial Estates

9.28 The development of industrial estates continued to be an important activity in efforts to attract investment and disperse industrial development to less-developed states. While the private developers were actively involved in the development of industrial estates in Melaka, Negeri Sembilan and Selangor, Government agencies, particularly State Economic Development Corporations (SEDGs), continued to be major developers in less-developed states. A total of 54 industrial estates, covering an area of 4,920 hectares, was developed by private developers, while a total of 46 industrial estates, involving an area of 10,091 hectares, was developed by SEDGs and other Government agencies during the Plan period.

9.29 In Peninsular Malaysia, the development of new industrial estates was no longer concentrated in the western corridor, but dispersed to the eastern corridor, especially in Pahang and Terengganu. The development of new industrial estates in Sabah centred around the Kota Kinabalu growth centre and in Sarawak, around the Kuching-Kota Samarahan and Bintulu growth centres. This was in line with the Government's policy of encouraging the dispersal of industries to the eastern corridor as well as principal growth areas in Sabah and Sarawak. To encourage industries to locate in these areas, the Government provided the necessary infrastructure facilities as well as introduced favourable tax incentives.

9.30 To ensure industrial estates were provided with basic infrastructure and amenities, particularly in the less-developed states, the Government allocated RM192 million in loans and RM99 million in grants for the SEDCs to finance land acquisitions, earthworks, road and drainage as well as contribution cost to *Tenaga Nasional Berhad* (TNB), *Telekom Malaysia Berhad* (TMB) and the Water Supply Authorities. By the end of 1995, loans and grants amounting to RM185 million and RM22 million, respectively, were approved for SEDCs.

Industrial Technology and R&D

9.31 During the Sixth Plan period, the private sector increased its contribution to the expansion of research activities when compared with the Fifth Plan period. The Federation of Malaysian Manufacturers Chief Executive Survey, 1995 indicated that an increased number of firms undertook some R&D with a view to improving industrial products, processes and services. In addition, in response to the demand for effective cost- and labour-saving technology, there was a marked increase in the usage of computer-aided design (CAD), computer-aided manufacturing (CAM) and computer-aided engineering (CAE) programmes as well as robotics. These were instrumental in enhancing industrial efficiency and productivity, especially in modernized and automated industries. To facilitate the rising demand for such programmes, a central facility for CAD/CAM/CAE training was established at the Standards and Industrial Research Institute of Malaysia (SIRIM), with other relevant agencies and the private sector complementing these efforts.

9.32 Improved fiscal and financial incentives as well as techno-infrastructure were provided to stimulate R&D and technological innovation activities in the private sector, especially for technology-intensive SMIs. A total of 200 companies benefitted from the matching grants provided under the Industrial Technical Assistance Fund (ITAF) to support product development and design schemes as well as quality and productivity improvement schemes. More than 60 technology-based start-up companies had access to common user facilities at minimal costs within the Technology Park Malaysia in Bukit Jalil, Selangor, while another 15 companies benefitted from the industrial incubator facilities provided by SIRIM. At the end of 1995, a total of 18 proposals was received from high technology-oriented companies, to house their industrial plants as well as R&D activities at the Kulim Hi-Tech Park (KHTP), Kedah.

9.33 Progress was made in increasing R&D linkages among research institutes, universities and the private sector. Industrial R&D was directed at improving efficiency and productivity, particularly among SMIs. Research efforts by SIRIM concentrated on the development of indigenous technologies and the adaptation and transfer of imported industrial technology to local enterprises. SIRIM acquired technological capability to provide rapid prototyping technology facility for use by industries to accelerate new product development. With this facility, SIRIM contributed designs, prototypes and fabrications to the ceramics, metal and plastic industries. The Malaysian Institute for Nuclear Technology Research (MINT) developed, among others, a novel device for accurate and proper application of radiation technology to ensure that industrial products were processed according to technical specifications. This technology was commercially significant as it had a wide application in irradiation plants within a number of industries, particularly in surgical and medical glove manufacturing. The Malaysian Institute of Microelectronics System (MIMOS) undertook R&D and training in Very Large-Scale Integrated Circuit (VLSI) design which is a key technology in microelectronic products. In addition, MIMOS assisted industries in printed circuit board (PCB) design, fabrication and assembly activities as well as integrated circuit failure analysis and the provision of Information Technology (IT) services. Within the universities, technology development activities were directed at new and emerging areas, such as environmental-related technologies and management, aeronautical engineering, advanced materials, laser technology and precision optics as well as industrial automation and intelligent systems.

9.34 With regard to resource-based industries, a number of research institutes such as the Rubber Research Institute of Malaysia (RRIM), Palm Oil Research Institute of Malaysia (PORIM), Malaysian Agricultural Research and Development Institute (MARDI) and Forest Research Institute of Malaysia (FRIM), made commendable contributions to upgrade and produce better quality and competitive products for the domestic and international markets. The RRIM undertook intensive research to overcome protein allergy in latex products with the aim of assisting the rubber industry to produce low protein rubber products, which were safer for users. Research efforts by PORIM contributed to raising the demand for palm oil and palm oil products both in the domestic and international markets. FRIM further improved R&D and provided guidelines for the processing and utilization of rubberwood by entrepreneurs in the furniture industry. There was increasing downstream applications-oriented research in the processing of less popular timber and non-timber forest resources to improve and diversify the potential uses of these materials. MARDI successfully commercialized a number of projects to promote the local food processing industry.

Small-and Medium-Scale Industries²

9.35 Based on the 1992 Annual Survey of Manufacturing Industries, SMIs accounted for about 84 per cent of total manufacturing establishments. However, although the SMIs represented the majority of manufacturing establishments, their contribution to total value-added and employment was about 28 per cent and 33 per cent, respectively, indicating that they were relatively less effective than their larger counterparts in terms of their contribution to the overall development of the manufacturing sector. This was due to the smallness of their size which constrained them from adopting advanced technology, employing more skilled workers, increasing their production capacity, expanding their market and enjoying economies of scale.

9.36 To develop a comprehensive updated database of SMIs, a nationwide Study on Small- and Medium-scale Industries was undertaken in 1994. Based on this Study, there were 12,108 SMIs with a paid-up capital of less than RM2.5 million and employing between 5 and 75 full-time workers. SMIs consisted of 10,400 small-scale industries and 1,708 medium-scale industries. The majority were concentrated in food, beverages and tobacco, fabricated metal products, machinery and equipment, wood and wood products, textile and wearing apparel as well as leather industries. The concentration of SMIs in these subsectors, suggested that they were not well integrated with mainstream industrialization, and if not aligned, would not be able to provide effective support to the larger scale establishments.

9.37 The majority of SMIs were owned by Malaysians. Foreign-owned SMIs accounted for 23 per cent of medium-scale establishments and 3.0 per cent of the small-scale establishments. About 47 per cent of medium-scale establishments exported their products, as compared with only 15 per cent of small-scale enterprises, indicating that adequate size is a necessary pre-requisite for the development of export-oriented products.

9.38 The SMIs produced a limited number of intermediate products for the larger industries, reflecting the lack of strong and widespread industrial linkages within the manufacturing sector. In this regard, the Study on SMIs indicated that only 20 per cent of them were involved in subcontracting activities. The subsectors where these activities were most prevalent were in automotive,

² Small-scale industries are manufacturing establishments with a paid-up capital of less than RM500,000 and employing between 5 and 50 full-time workers. Medium-scale industries are manufacturing establishments with a paid-up capital of between RM500,000 and less than RM2.5 million and employing between 51 and 75 full-time workers.

electrical and electronic products as well as food products, where the Government took a proactive role in these activities. It was estimated that there were 60 SMIs consisting of 48 medium-scale and 12 small-scale industries, which were involved in supplying parts and components to major car assemblers. They represented less than half of 129 companies involved in the subcontracting activities of major assemblers indicating that the supporting industries were actually dominated by larger scale establishments.

9.39 The *development strategies* for SMIs during the Sixth Plan period emphasized forging linkages between SMIs and the larger industries and facilitating SMIs to penetrate export markets. These strategies were implemented through new programmes such as the provision of industrial infrastructure and soft loan schemes to facilitate their expansion and modernization. In addition, existing programmes such as vendor development, integrated marketing, nursery factory schemes and ITAF were continued. The supporting programmes contributed towards the development of the Bumiputera Commercial and Industrial Community (BCIC).

9.40 The *vendor development programme*, which started in 1988 with the implementation of the Proton Component Scheme, was extended to other industrial subsectors such as electrical and electronics, wood-based and engineering industries during the Sixth Plan period. Tripartite arrangements involving the Ministry of International Trade and Industry (MITI), anchor companies and financial institutions were introduced to accelerate the implementation of this programme. Under this arrangement, co-ordinated by MITI, the anchor company guaranteed the market to the vendor, while the financial institutions provided loans to the vendor. Since its launch, the vendor development programme succeeded in creating 63 vendors which supplied parts and components to anchor companies. Besides this programme, *Petroleum Nasional Berhad* (PETRONAS), TMB and TNB were also involved in the development of vendors through a similar programme managed by the Ministry of Finance, which created business opportunities for 60 companies during the Plan period. The integrated marketing arrangement continued to provide important marketing channels for Bumiputera entrepreneurs in the food and furniture industries. A total of 155 vendors operated under the integrated marketing scheme with total sales amounting to RM348 million during the Sixth Plan period.

9.41 To promote the orderly development of SMIs, the Government assisted in the *provision of industrial sites* at affordable prices through the establishment of SMIs Industrial Parks. An allocation of RM55 million was provided under

the Sixth Plan, with Malaysian Industrial Estate Sdn. Bhd. (MIEL) entrusted as the developer. At the end of 1994, five projects were completed in Bentong, Ipoh, Kemaman, Kuching and Sungai Petani with a total area of 10 hectares and 71 units of factory buildings. In addition, the first phase of the Kampung Batu SMI Industrial Complex in Wilayah Persekutuan Kuala Lumpur, provided 22 units of factory buildings, while the implementation of the second phase involving 86 additional units of factory building is currently underway. Another six projects with an area of 234 hectares and 1,315 units of factory buildings located in Johor Bahru, Kemaman, Kuantan, Masjid Tanah, Pemas and Sungai Petani were under various stages of construction.

9.42 To promote Bumiputera participation in the furniture industry, the *furniture village programme* was launched. Under this programme, the Federal Government financed site preparation, basic infrastructure and common facilities, the state governments provided land, while the entrepreneurs were responsible for setting up the factories. At the end of 1995, the construction of 46 factories in furniture villages at Setiu in Terengganu, Temerloh in Pahang and Ulu Yam in Selangor was under various stages of implementation.

9.43 To complement *credit facilities* managed by Bank Negara and normal credit lending by commercial banks, the Government provided RM140 million for two special loan schemes, namely, the Soft Loan for Modernization and Automation (SLMA) and the Soft Loan for Quality Upgrading. Both schemes provided loans for the purchase of machinery equipment and parts. Under the SLMA scheme managed by the Malaysian Industrial Development Finance (MIDF), loans totalling RM30.8 million were approved to 78 companies up to December 1995, while under the Soft Loans for Quality Upgrading by *Bank Pembangunan*, loans totalling RM51.1 million were approved to 114 companies.

9.44 *Rural industries* were promoted to increase the income of the rural population as well as provide the springboard for the development of SMIs. To assist in their development, several supporting programmes, such as the provision of machinery, training, marketing and infrastructure, were undertaken. A total of 700 rural entrepreneurs in the food processing and textile and apparel industries, and two special services such as printing and film processing was provided with the necessary machinery to improve production capabilities. In addition, a total of 14,160 rural entrepreneurs benefitted from training programmes aimed at improving their business and management skills. The marketing and distribution of processed food, which was a major product of rural industries, was managed by a cooperative, namely, NASCO Industry Sdn. Bhd. which

recorded total sales of RM9 million. Industrial estates were also established in rural areas by various regional development authorities to provide suitable business locations for the setting up of industries. A total of 18 new industrial estates, involving an area of 433 hectares, was established by various regional authorities. About 12,730 people were employed in industries sited in these industrial estates.

III. PROSPECTS, 1996-2000

9.45 The Seventh Plan period is an important phase in the country's drive towards becoming a fully industrialized economy. The manufacturing sector will have to transform itself to become a more dynamic sector with high value-added, capital-intensive, high-technology as well as skill-and knowledge-intensive industries in order to achieve productivity growth and competitiveness.

Developments in the International Environment

9.46 In the post-Uruguay Round period, the national economy is expected to be more integrated with the global economy. The challenges facing Malaysia include the emergence of more competitors pursuing similar growth strategies based on attracting FDI. To prepare for the competitive environment arising from the formation of AFTA and the removal of the Generalized System of Preferences (GSP) status, Malaysian firms will need to rationalize and innovate in order to achieve greater efficiency. Another challenge is the rapid advancement in technology which widens the gap between developed and developing countries. In this regard, concerted efforts are required to bridge this gap and industries are encouraged to source for new production methods and utilize advanced materials. Since environmental protection is a global issue, industries will be required to utilize production technologies that reduce pollution as well as develop environment-friendly products.

9.47 Against the above challenges, industrial development in the country will be further influenced by the international growth scenario. In this regard, there are opportunities for growth arising from the recovery of the world economy which is projected to grow at an annual rate of 3.3 per cent during the Plan period. World trade is forecasted to grow at 6.0 per cent per annum in the same period, while the implementation of the Uruguay Round agreements is expected to increase the volume of world merchandise trade by

US\$200-US\$300 billion annually. With regard to the availability of capital for investments, world FDI flows into developing countries are projected to reach about US\$80 billion in real terms by the year 2000.

Growth Prospects of the Manufacturing Sector

9.48 The Seventh Plan targets high output growth for the manufacturing sector at an average annual rate of 10.7 per cent, while the sector's share of GDP is forecasted to increase from 33.1 per cent in 1995 to 37.5 per cent in the year 2000. Investment in the sector, which is projected to reach RM110 billion, is largely to support the shift into capital- and technology-intensive industries. Domestic investment is expected to be higher than foreign investment with the continued implementation of the DII. Based on a domestic to foreign ratio of 60:40, domestic investment is projected to be around RM66 billion.

9.49 Manufactured exports are expected to spearhead the growth in merchandise exports and are targeted to grow at an average annual rate of 16.9 per cent. With this growth, the share of manufactured exports to total exports is forecasted to increase from 79.6 per cent in 1995 to 88.6 per cent by the year 2000.

Strategic Thrusts

9.50 Policy adjustments will be undertaken during the Seventh Plan period to achieve the sectoral growth targets, to meet the challenges of a competitive global trading environment and to overcome the constraints such as skill shortages, rising costs of raw materials and limited domestic manufacturing capabilities. In this regard, the Government is undertaking the new IMP Study to recommend policies and strategies to address issues and challenges facing the manufacturing sector in the medium- and long-term. The Study will analyze existing industry clusters such as electronics and textiles as well as potential industry clusters, such as chemicals and chemical products, aerospace, materials and advanced materials, to enhance their competitiveness. The new IMP will provide for the continuous monitoring and evaluation of industrial development in a rolling plan framework. This represents a major shift in approach from the earlier IMP and will require the concerted participation of both the public and private sectors in the implementation and monitoring of the identified strategies.

9.51 The Seventh Plan will introduce strategies which emphasize the diversification, modernization and strengthening of the industrial base as follows:

- o re-orientating industrial policy to stress on encouraging industries to undertake large-scale production from the initial stage of project implementation, to reap economies of scale and to cater to the export market. This will require production of world-class quality goods as well as extensive and aggressive marketing;*
- o promoting the manufacture of capital and intermediate goods, not only for the manufacturing sector but also for other sectors such as construction and energy, so as to reduce the reliance on imported components and equipment, thus contributing to the reduction in the deficit in the balance of payments;*
- o expanding new growth industries such as petrochemical and aerospace industries;*
- o promoting greater intra-and inter-industry linkages, particularly in the electrical and electronic products, telecommunications, automotive as well as iron and steel fabrication industries;*
- o encouraging increased investment in downstream activities of resource-based industries such as cocoa and food products, oleochemical, petrochemical, pulp and paper, rubber and wood products;*
- o intensifying efforts at acquiring technology and commercialization of new and improved technologies;*
- o implementing an export-targetting approach to increase the market share of Malaysian exports;*
- o promoting greater industry association participation in skill training;*
- o expanding offset arrangements;*
- o focussing on the development of SMIs as strong supporting industries to larger enterprises and to be export-oriented;*
- o emphasizing the development of specialized industrial estates; and*
- o maximizing the benefits of reverse investment to the country.*

Improving the Structure and Competitiveness of Industry

9.52 Within the context of a rapidly changing international economic environment, a critical component in an export-oriented economy like Malaysia is the competitiveness of its industries. The 1995 World Competitiveness Report placed Malaysia in second position among the newly industrializing economies and 21st. position out of a total of 49 countries. The Report highlighted that at the present stage of industrialization, the two critical factors, human resource and science and technology, urgently require further upgrading to improve the country's competitiveness position. In this regard, measures will be taken in the Seventh Plan to increase the supply of skilled workers as well as upgrade technological capability. These measures are expected to lead to increased productivity and support higher value-added manufacturing, which in turn will strengthen the competitiveness of industries.

9.53 The new approach in industrial policy is to re-orientate industries, particularly domestic heavy and strategic industries, to target production for the world market from the initial stage of project implementation. This will require large-scale production to reap economies of scale and to be complemented by extensive and aggressive promotion and marketing in traditional and new markets. Apart from increasing exports, this strategy will lead to lower unit costs and avert the occurrence of shortages in the domestic market caused by the adoption of a cautious incremental production approach of current producers of goods such as cement and automobiles. The Government, through specialized export agencies such as MATRADE and the Export-Import (EXIM) Bank, will provide the necessary support in strategic marketing and export financing, respectively. In addition, the Government will consider introducing support measures such as financing of feasibility studies to encourage and facilitate large-scale production. To further strengthen the competitiveness position of Malaysian manufacturers in the world market, existing industries may need to be restructured through the formation of joint ventures and consortia.

9.54 Underlying the success of this strategy is the need to provide a liberal trading environment through a gradual reduction in the level of protection of domestic industries to ensure their competitiveness in the export market. In addition, taking into account the current level of technology and skills, a more innovation-driven industrial programme will be undertaken, emphasizing the development of high value-added, capital-intensive and export-oriented industries. The objective is to shift towards skill-intensive and technologically-sophisticated industries producing more varied, better designed and competitive products that meet the demand of global markets.

Machinery and Engineering Industry

9.55 The machinery and engineering industry includes the machinery and equipment, fabricated metals and foundry subsectors undertaking activities such as casting, forging, metal treatment, surface treatment, machining as well as mould and die making. The development of this industry is important not only for line-production industries such as automotive and home appliances industries, but also for other industries requiring engineering services. Other economic sectors such as construction and energy which currently rely on imported machinery and engineering services will also benefit from the advancement of this subsector. In 1995, approved investment in this industry was about RM869 million and accounted for only 4.0 per cent of total approved investment in the manufacturing sector. The country has yet to achieve a satisfactory level of development in this industry as most of the foundry and supporting engineering industries are small in operation and poorly equipped. With the country moving towards developed nation status, priority has to be given to upgrade the technological capabilities of companies in this subsector.

9.56 During the Plan period, efforts will be taken by the Government to improve the productivity and competitiveness of the industry. In this regard, an action plan will be formulated to address issues such as economies of scale, technology, finance, product quality and management. The establishment of engineering industrial parks for mould and die, foundry and engineering, and metal servicing will be promoted. The grouping of these industries in such industrial parks is expected to facilitate R&D institutes to assist industries upgrade their production techniques, and intensify R&D and training activities. Other supporting services, such as testing facilities and warehousing, will also be centralized in these industrial parks. Apart from the development of new products, enterprises in the machinery and engineering subsector should refurbish and recondition idle heavy machinery in order to recycle the use of these machinery so as to reduce the import of new machinery. Accordingly, local fabrication of parts and components for such machinery as well as the manufacture of machine tools will be encouraged.

Electrical and Electronic Products Industry

9.57 The electrical and electronic products industry is the leading subsector in the manufacturing sector in terms of output, export earnings and employment. The growth prospects of this industry is assured in the medium term due to

the continuing strong global demand for business and consumer electrical products. Demand for consumer electronic products like computers, televisions, car stereos and video players depends largely on consumer affluence and the ever changing taste and higher expectations for sophisticated products. A modern and sophisticated telecommunications system will drive the need for more advanced consumer electronic goods. With the rapid advancement of the information age and knowledge-based society, global demand of hardware and software for computers is expected to increase correspondingly.

9.58 At present, the industry in Malaysia is dominated by a small number of multinational companies and is characterized by a high dependence on imported parts and components. In 1995, the import of electronic parts and components amounted to RM39 billion and accounted for 44.3 per cent of the total import of intermediate goods. As such, a key strategy of the Seventh Plan will be the development of local electronic parts and components as well as the promotion of backward integration of the semiconductor industry through the establishment of wafer fabrication plants.

9.59 Wafer fabrication is of strategic importance in the country's industrialization drive as it is a core technology of the semiconductor industry. The establishment of wafer fabrication plants will also increase the linkages within the industry through the development of precision parts and components such as vacuum equipment, precision valves as well as encourage R&D activities. Other spin-off effects include the development of skills in servicing of precision mechanical, electro-mechanical and mechatronic equipment such as robotics and the establishment of local suppliers of high purity chemicals and gases. Since electronics is an inherent part of other industries, such as machinery and engineering, automotive and aerospace, the establishment of wafer fabrication plants will promote the development of high technology industries in the country.

9.60 Measures to increase the manufacture of local electronic components include establishing strategic alliances with multinational companies, strengthening local absorptive capacity of high-technology processes through training and extending the vendor development programme. Efforts will also be intensified to encourage the development of Malaysian brand names of consumer electronic products. To attract investments in wafer fabrication plants, a special package of incentives will be provided which includes pioneer status for 10 years on 100 per cent of the statutory income or 100 per cent Investment Tax Allowance as well as the provision of a special training grant and land at reasonable prices.

Automotive Industry

9.61 The automotive industry consists of passenger and commercial vehicles, motorcycles, and parts and components industries. The size of the domestic market for passenger and commercial vehicles is estimated to be about 185,000 units, of which 80 per cent of the demand is for passenger vehicles. In spite of competitive export markets, Malaysia has made inroads by exporting 86,600 passenger vehicles and 2,600 commercial vehicles, during the Plan period. Although the domestic market is expanding, the growth of the automotive industry in the long run will depend on the capability of automotive manufacturers in penetrating export markets. Moreover, within an open multilateral trading system, the domestic market will no longer be a captive market for local assemblers unless they begin to adopt new competitive strategies.

9.62 The ability to successfully enter export markets will depend largely on the supply of cost-competitive and high quality parts and components. Since the parts and components industry is not fully developed, the domestic investment strategy in the Seventh Plan will give more emphasis to enhancing the production base of key parts and components including child parts, particularly related to engine, suspension and steering, brake and power transmission. For the export market, the component manufacturers are in a favourable position to venture into the production of electronically-controlled devices such as engine control units, power steering control units and transmission control units. Private investment in the production of both key and child components will be encouraged through options such as joint ventures with foreign companies, acquiring foreign technology, restructuring small supporting industries in the automotive sector as well as nurturing existing and potential vendors. In addition, manufacturers will be encouraged to venture into the production of commercial vehicles for the export market as well as heavy vehicles for the defence sector. These measures will be undertaken to aggressively promote the automotive subsector as a leading industry, which produces the finished automotive as well as parts and components for both the domestic and export markets.

Aerospace Industry

9.63 The aerospace industry will be promoted as a new growth sector since the development of this industry will contribute to the building of higher levels of technology and skills, many of which are transferable to other sectors of the economy. In terms of market potential, the prospects are bright as air travel for business and pleasure is expected to increase with greater globalization and

affluence. Malaysia's market niche is in the manufacture of small aircraft, the production of aircraft parts and components as well as the development of avionic and services-related industries. In this context, SME Aerospace has successfully produced the MD3-160, the first locally built trainer aircraft, and Malaysian owned Eagle Aircraft Pty. Ltd. manufactured the Eagle XTS, a two-seater composite general aviation aircraft. In addition, to boost the development of the aerospace subsector, more aerospace-related projects are needed during the Seventh Plan period.

9.64 Recognizing the importance of this subsector to the economy, the Government will promote Malaysia as a regional hub for international aviation, maintenance and engineering as well as a venue for business meetings and exhibitions of major international aerospace companies such as the Langkawi International Maritime and Aerospace (LIMA) show. Measures will be taken to improve the business environment to attract new investments and promote the growth of existing companies. In this regard, three major measures that will be implemented in the immediate future are, strengthening the Department of Civil Aviation, enforcing the Malaysian Civil Aviation Regulations and intensifying training to provide the skilled manpower required by the aerospace industry. Offset arrangements will also be encouraged to further develop the local aerospace companies.

Petrochemical Industry

9.65 Rapid industrial development has increased the demand for new and advanced materials made from petrochemical products. These advanced materials will be the new frontiers of industrial development and efforts will be geared towards producing such materials and keeping the petrochemical industry abreast with the dynamics and needs of new markets. In view of the policy to promote the utilization of the country's gas resources as feedstock material, the petrochemical industry is in a position to better contribute to the growth of capital- and technology-intensive as well as higher value-added products, especially in the plastics and fertilizer industries. This will ensure the greater utilization of natural gas-based raw materials such as ethylene, propylene and ammonia. In addition, following the expansion of the domestic crude oil refining capacity, the country has another important source of feedstock for a wider range of petrochemical products, such as aromatics which is an essential element for the manufacture of downstream products such as fibres, films, bottles and kitchenwares. This will provide new opportunities for local private sector participation in both the primary and downstream petrochemical industry.

9.66 The development strategies to spur the growth of the petrochemical industry include expanding the local and regional markets through better market information as well as encouraging manufacturers to produce niche products at competitive prices and with a high standard of product quality. There is also a need to develop the base for local raw materials to achieve a higher level of production geared towards import substitution and help reduce the country's dependence on chemical imports. As the technologies to produce advanced materials are still in the domain of developed countries, it is important for the petrochemical industry to form strategic alliances with MNCs in order to acquire these technologies effectively.

Iron and Steel Industry

9.67 The country's iron and steel industry is narrowly focussed in terms of product range, producing basic steel products such as wire rods and steel bars. As a result, all of the domestic requirements of hot-rolled flat products, such as hot-rolled coils, plates and sheets, have to be imported. In order to restructure the industry towards higher levels of efficiency and productivity as well as facilitate the development of feedstock for cold-rolled products such as galvanized sheets and tinplates, the Government encouraged the private sector to set up hot-rolled flat products plants in the country. Such high grade flat products are essential for other manufacturing and heavy industries such as consumer electronics, automotive and shipbuilding. The successful implementation of these plants will contribute towards the development of higher value-added steel products and foster better intra- and inter-industry linkages.

9.68 In line with the new industrial policy of promoting large-scale production of heavy and strategic industries such as iron and steel, the Government will encourage the private sector to set up an integrated steel mill to cater to the increase in demand in the domestic and regional markets for steel and stainless steel fabricated products. Such an integrated steel mill, which will operate a continuous production process from raw materials to final products, will increase local value-added in the iron and steel industry as well as provide for more efficient utilization of energy resources in the country.

Resource-based Industries

9.69 The policy thrust of the Plan period is the continued development of the resource-based industries such as cocoa and food products, petrochemical, pulp and paper, rubber and wood products. The expansion of the downstream

activities utilizing the country's natural resources will contribute towards the manufacture of higher value-added products such as advanced ceramic, furniture and oleochemicals as well as promote industry linkages. In this regard, large companies with access to resources have the competitive advantage to venture into the downstream manufacturing of these resources and utilize biotechnology and environment-friendly technologies. The Government will continue to provide financial assistance through the DIF for the upgrading and modernization of these industries. Public sector research institutions will also provide support through contract research and commercialization of R&D findings. In addition, MATRADE will collaborate with the private sector to source new markets for these products.

High-Technology Intensive Industries

9.70 An essential component of the on-going structural transformation of industry will be the shift into technology-intensive industrial activities. Towards this end, a critical aspect will be the harnessing of advanced technology to expedite structural changes in new and traditional industries, which in turn, will boost overall productivity, growth and diversification of the manufacturing sector. The utilization and application of new and improved technologies will provide increased scope for industrial innovations, create greater opportunities for investment in new income-generating activities as well as widen the technological base.

9.71 A number of approaches will be undertaken simultaneously. In general, policy instruments will include measures to induce the flow of investment into targeted high-technology industries, support the development and commercialization of indigenous technology and promote the upgrading of scientific and technological skills. Apart from improving existing incentives, new ones will be put in place to promote the development of high-technology products and activities. Industries are expected to diversify into new high value-added products and processes, while the low value-added businesses are expected to relocate to other countries. Leading industries and high-technology firms will be encouraged to acquire technology and R&D companies, to undertake technological adaptations and improvements and innovations, as well as commercialization of new and improved technologies. With increasing globalization, strategic alliances with overseas companies in capital-intensive and high-technologies industries will be encouraged to assist domestic industries access new technologies and markets.

9.72 In support of the above trend towards higher technology content industries, the private sector will be expected to undertake substantial efforts to increase technological capability. This will include integrating best technology management practices within corporate planning, increasing R&D facilities, expanding engineering consultancy and design services, improving standardization and quality control, and providing risk capital. Recognizing the high cost and complexity of scientific and engineering research, companies are anticipated to enter into mutually beneficial collaborative research arrangements with universities and research institutes. This will ensure that public sector research agencies contribute more effectively to demand-oriented R&D output required by industry.

Promoting Export-Oriented Industries

9.73 During the Seventh Plan period, the export-oriented strategy will continue to be emphasized. The liberalization of the international trading environment and the removal of the GSP schemes by the United States in 1997 will provide both opportunities and challenges for the country's exports. In this respect, there is still considerable scope for the expansion of manufactured exports considering that the country's share of manufactured exports in the global market is only about 1.0 per cent. In order to sustain the growth of export-oriented industries, efforts will be made to build upon existing comparative advantages, diversify exports and penetrate new markets. The opportunities for export will be matched with competent market-oriented trade and export policies and programmes. In this regard, MATRADE is expected to provide more dynamic services to exporters.

9.74 Trade promotion, through participation in international trade fairs, will continue to be encouraged with greater emphasis on the quality of the exhibited products. Efforts will also be undertaken to promote Malaysian brand names through more intensive advertising and marketing. The newly-formed GTCs will conduct market studies and organize fact-finding missions, particularly to new markets. Information on market opportunities will be disseminated through seminars with the private sector. Assistance will also be provided by MATRADE in sourcing for raw materials and semi-processed products required as inputs for the manufacturing sector with the objective of reducing the costs of production.

9.75 A focussed export-targetting approach will be taken to increase the market share of Malaysian exports, particularly in markets that have the potential for increased demand of such goods. In this regard, MATRADE will work

together with the private sector to promote Malaysian products particularly, resource-based products in foreign markets and organize exhibitions of such products. Efforts will be taken by MATRADE to upgrade the marketing capabilities of the private sector through training and consultations on various aspects such as product design, packaging and labelling.

9.76 As part of the export initiatives, the newly established EXIM Bank will complement the efforts of commercial banks in export financing. The EXIM Bank will provide medium- and long-term credit to promote exports of high value-added manufactured products. In addition, the Bank will promote 'project exports' such as construction and infrastructure projects and services. It will also provide export marketing, finance, information and advisory services to facilitate the entry of Malaysian exporters to new markets, particularly the countries of the South.

Skilled Manpower

9.77 For the Seventh Plan period, as industries move into sophisticated and higher technology-based manufacturing activities, more trained and skilled manpower will be required to enhance the competitiveness of industries in the global market. The restructuring of industries towards automation and robotics will require more skilled production workers with computer literacy and ability to utilize automated machinery as well as engineering ability to carry out maintenance on machinery and equipment.

9.78 While the present gap in the supply of skilled and semi-skilled labour for industries is expected to be alleviated, among others, by the increasing output of skilled and semi-skilled labour from technical and vocational centres, the private sector is expected to increase its involvement in providing the necessary skills required by industries. Towards this end, a strategy during the Plan period is to encourage industry associations to initiate training programmes required by specific industries. To support this strategy, the Government will consider the provision of financial assistance to the private sector for the establishment of such training institutions. Corporations which have training facilities should also extend such facilities to non-employees so as to increase the supply of trained manpower. The encouragement of a higher level of participation in the skilled tradesman profession will also require a change in the value system of corporations in terms of providing brighter career development prospects for personnel in technical skills as well as promoting a more conducive technical and engineering work environment.

Offset Arrangements

9.79 Offset arrangements are part of contract agreements that are designed to help purchasers obtain the desired transfer of technology and provide local employment. Defence products and large commercial aircraft sales are the areas where these agreements mainly arise. They include co-production, licensed production, subcontract, technology transfer, training and counter purchase. To optimize and disperse the benefits of these arrangements, target groups will be enlarged to include more private establishments in the manufacturing sector, particularly in aerospace and maritime industries, as well as SMIs in the machinery and engineering subsector. Towards this end, the Government will formulate an action plan to facilitate and steer the implementation of offset programmes. In addition to an implementation schedule, the action plan will provide information on critical technologies, potential companies and funding arrangements. The Government will also encourage entities such as PETRONAS, TNB, Malaysia Airlines (MAS) and the Heavy Industries Corporation of Malaysia (HICOM) as well as local multinational corporations, to embark on offset programmes in their own procurements and implementation of large-scale projects.

Strategy Readjustment for SMIs

9.80 The focus of the development strategy for SMIs has been to strongly emphasize the development of domestic market-oriented, small-scale industries and, in particular, for the BCIC. During the Seventh Plan period, efforts will be taken to support the development of medium-scale industries which exhibit strong growth potential. In line with the industrial policy to promote exports, a strong, viable and modern export-oriented SMIs subsector will be emphasized to ensure a balanced and efficient industrial structure in the country. In this context, the SMIs development strategy will be readjusted by adopting a two-prong approach. The first approach is to promote production efficiency while the other is to consolidate, strengthen and extend the outreach of existing SMIs programmes. Strategically, this approach is aimed at promoting SMIs as competitive industries, which supply child parts and components for both the domestic and global markets.

9.81 Existing institutional arrangement for SMIs development will be improved during the Plan period. In this regard, a Small and Medium Scale Industries Development Corporation (SMIDEC) will be established to provide

effective leadership as well as formulate more focussed development programmes. This Corporation will have authority on operational planning and overall implementation and coordination.

9.82 The export-oriented industries such as electrical and electronic products, machinery and engineering as well as parts and components offer future growth potential for SMIs. The transition from domestic to export markets is a major step for SMIs and they will require expert assistance initially, to market their products overseas. In this context, an export market development scheme will be introduced to assist new SMI exporters develop expertise in marketing, promotion, distribution, pricing, packaging and transportation. SMIDEC, together with MATRADE, will be given the task to undertake this scheme.

9.83 The supporting programmes implemented by Government agencies will be further expanded to enable more SMIs to be upgraded and integrated into the mainstream of the manufacturing sector. To complement these efforts, two new programmes, namely, the Technology Development and Technology Acquisition Programmes, will be introduced.

9.84 Entrepreneurial development programmes will focus on nurturing entrepreneurs and enterprises through training, providing business opportunities, as well as financing and supporting infrastructure, for Bumiputera entrepreneurs requiring such services. These services will be made available in an integrated package and will be promoted alongside existing support programmes to address specific gaps in finance, training and marketing.

Industrial Estates

9.85 The Government will continue to encourage active participation of private developers in the development of industrial estates on an individual basis as well as on a joint-venture basis with government agencies. In line with this, the direct participation of government agencies in industrial estate development except in less-developed states, will be reduced. The private sector, particularly large plantation companies, who own large tracts of land in strategic locations will play a more active role in the development of industrial estates. Under the Seventh Plan, loans amounting to RM486 million will be provided mainly for the development of industrial estates in less-developed states such as the Damak Laut Industrial Park, Sarawak, the Kota Kinabalu Industrial Park, Sabah, the Gebeng Phase II Industrial Park, Pahang and the Telok Kalong Phase II Industrial Park, Terengganu.

9.86 With the diversification of the Malaysian industrial structure, the requirement of industries for industrial infrastructure and supporting services will become more specialized. To accommodate this, the Government will encourage private developers to establish specialized industrial estates similar to the KHTP in Kedah. Besides Phase II and Phase III of KHTP, four projects of this nature, namely, the Subang Industrial Aerospace Park in Selangor, the Composite Technology City in Batu Berendam, Melaka, the Natural Resources Park in Kuching, Sarawak, and the Automotive Town in Tanjong Malim, Perak, are expected to be in operation during the Seventh Plan period. While the Subang Industrial Aerospace Park will focus on the development of aerospace-related services and general aviation, the Composite Technology City will attract investments in the production of composite-based products, both aerospace and non-aerospace.

9.87 The Automotive Town will further promote the development of the automotive industry and inter-firm linkages amongst assemblers and component manufacturers. In addition, the Automotive Town will attract new investments in automotive and automotive-related industries through the provision of specialized supporting and testing facilities, business information centres, warehousing and housing facilities. The Natural Resources Park will function as the premier centre of technological and industrial development in the field of natural resources and biotechnology.

Reverse Investment

9.88 With increasing globalization and new investment opportunities, more Malaysian entrepreneurs are investing overseas in countries such as South Africa, Cambodia, People's Republic of China, Vietnam and Papua New Guinea. Malaysian investment abroad increased from RM1.4 billion in 1990 to RM5.4 billion in 1995. During the Seventh Plan period, reverse investment is expected to increase as the experience gained by Malaysian entrepreneurs in privatization, particularly in the development of infrastructure and power projects, will boost their confidence in implementing similar projects overseas. Malaysian entrepreneurs undertaking reverse investment should source their funds from abroad to minimize the outflow of domestic capital funds.

9.89 To ensure that the country maximize the benefits from reverse investment, the Government is encouraging the remittance of income from overseas investment by granting 100 per cent income tax exemption on such remittances. Other measures that will be undertaken during the Seventh Plan period include

encouraging the utilization of Malaysian goods and services when implementing projects abroad, provision of bulking facilities and transshipment overseas and the relocation of labour-intensive, low-technology industries which have become less competitive locally, to other lower cost regions including the growth triangle areas.

IV. ALLOCATION

9.90 The development budget to support industrial development in the Seventh Plan is RM2.5 billion, as shown in *Table 9-8*. The allocation will be utilized to complement the efforts of the private sector in enhancing the competitiveness of industries. In this regard, greater emphasis will be given to technology development and acquisition, commercialization of R&D, upgrading of industrial infrastructure, as well as providing support programmes for SMIs. Other priority areas include the development of rural industries, training and skill development by industries, and the upgrading of industry-related agencies to provide more efficient services to the private sector.

TABLE 9-8			
DEVELOPMENT ALLOCATION FOR INDUSTRIAL DEVELOPMENT, 1991-2000 (RM million)			
Programme	6MP		7MP
	Allocation	Expenditure	Allocation
Industrial Estates Development	291.1	211.3	551.0
Development of Industrial Infrastructure	248.9	181.0	163.5
SMI Development	118.6	105.2	546.9
Domestic Investment Fund	175.3	158.9	500.0
Rural Industries	154.0	118.9	167.3
Training & Consultancy Services	106.4	95.1	182.9
Investment in Heavy Industries	580.1	567.7	163.4
Implementation of Action Plan for Industrial Technology Development	47.8	16.9	125.8
Wafer Fabrication Project Fund	-	-	100.0
Total	1,722.2	1,455.0	2,500.8

V. CONCLUSION

9.91 Industrial development in the country progressed rapidly in the Sixth Plan and indicated the success of the export-oriented strategy. The country requires a stronger industrial base in order to support the accelerated industrialization drive towards Vision 2020. Thus, the policy thrusts during the Seventh Plan period include enhancing the competitiveness of industries through large-scale production to cater to the world market and the promotion of a wider range of manufactured products in traditional and new markets, as well as the development of export-oriented SMIs. In this regard, policies, strategies and programmes to support industrial development, particularly with regard to skilled manpower and technology, will be continuously reviewed to complement the efforts of the private sector in this dynamic sector.

Chapter 10

Education and Training

10

EDUCATION AND TRAINING

I. INTRODUCTION

10.01 Education and skill training is accorded high priority in nation-building in order to provide a sufficient pool of well-educated, highly-skilled and strongly-motivated labour force as well as to produce responsible citizens with high moral and ethical values. Education and training programmes and projects during the Sixth Plan period focused on expanding the capacity of institutions and improving the quality of manpower. In addition, increasing accessibility and participation of the low-income group in education and training were emphasized.

10.02 During the Seventh Plan period, a number of major changes will be introduced to the education and training system with a view to strengthening and improving the system. These efforts are expected to improve the quality and increase the quantity of output to meet the manpower needs of the nation, particularly in the fields of science and technology. In addition, continued emphasis will be given to expand educational opportunities for those in the rural and remote areas.

10.03 Skill training will be undertaken on a larger scale with the objective of increasing enrolment in and output of skilled technical manpower from both the public and private training institutions. Training institutions will conduct more advanced skill courses in line with the changing economic structure of the country as it moves towards high technology and higher value-added activities.

II. PROGRESS, 1991-95

Education Programmes

10.04 During the Sixth Plan period, the overall thrust of education was on expanding capacity and increasing access to all levels of education, strengthening

the delivery system and improving the quality of education. The development of curricular and co-curricular activities emphasized the objective of producing Malaysian citizens who are knowledgeable, innovative and possess positive values, and thus able to participate actively and contribute to the development of the nation. In this regard, the private sector and privatized public entities were also encouraged to expand their capacity and provide quality education.

10.05 The expansion in education programmes resulted in increases in enrolment at all levels of education. However, several concerns still remained, particularly those pertaining to student academic achievement and enrolment in the science stream at the secondary level. In addition, only a small proportion of students of the relevant age-group was enrolled at the degree level in public institutions of higher learning.

Pre-school Education

10.06 Recognizing the importance of pre-school education in laying a strong foundation for children in their formative years, efforts were taken to increase facilities and improve quality of pre-school education. As the private sector was more active in the establishment of pre-school centres in urban areas, the public sector agencies continued to provide pre-school education opportunities to rural and urban poor children. Efforts by both the public and private sectors including non-governmental organizations (NGOs), resulted in an increase in pre-school centres from about 6,960 in 1990 to 10,350 in 1995. Correspondingly, the number of children in the 5-6 age category enrolled in these centres increased from 328,800 in 1990 to 420,600 in 1995, representing an increase of 27.9 per cent. The public sector was the main provider of pre-school centres, totalling 8,450 or 81.6 per cent, while the private sector including NGOs accounted for the balance. Of the total pre-school centres established by the Government, 80 per cent were in rural areas which benefitted about 204,100 rural children.

10.07 Improvements in the quality of pre-school education were carried out through revision of the curriculum guideline, expansion of teacher training and establishment of minimum qualification for pre-school teachers. The revised curriculum emphasized the diversification of teaching methods to make them more interesting to children. These methods included exploring the natural environment, using attractive teaching materials and encouraging teachers to familiarize children with proper usage of *Bahasa Malaysia* as well as simple usage of English words in their daily communication and activities.

Primary Education

10.08 The development of primary education continued to focus on expanding capacity, improving existing facilities, increasing accessibility to better education for all children in the 6-11 age-group including the disabled and improving student achievement, particularly in rural and remote areas. Measures taken to improve the overall quality included increasing the number of experienced and qualified teachers, particularly in rural schools as well as developing and improving teaching and learning materials. In order to instil interest in science from an early age, elements of science were introduced in the Standard I curriculum during the 1994/95 school session, while science as a separate subject was introduced in Standard IV. In addition, to increase competency in mathematics, a more detailed syllabus for teaching mathematics for Standards I and IV was developed in 1994.

10.09 Universal primary education was maintained throughout the Plan period. Primary school enrolment increased by 16.7 per cent from 2.4 million in 1990 to 2.8 million in 1995, as shown in *Table 10-1*. Despite the success achieved in universal education, the number of students who dropped out from the Government and Government-aided schools was quite large. Of the total children in the age cohort 6 – 11 enrolled in these schools, about 4.0 per cent or 18,000 children did not complete primary education. However, a substantial number of these children were enrolled in private primary schools as shown by the increased enrolment in such schools during the Plan period.

10.10 In order to accommodate increases in enrolment, reduce overcrowding in urban schools and replace dilapidated facilities in rural areas, a total of 9,530 additional classrooms was constructed to benefit about 353,000 students. As a result, the classroom-student ratio improved slightly from 1:38.3 in 1990 to 1:36.4 in 1994. However, due to the rapid increase in enrolment, particularly in the urban areas, 28 per cent or 23,363 classes had an enrolment of more than 40 students per class. To reduce the pressure of classroom shortage, the respective schools conducted classes in the afternoon. The number of schools with such classes increased from 15.5 per cent in 1990 to 18.3 per cent of total primary schools in 1994.

10.11 Improvements in education facilities and access of the poor and those in the rural areas to educational opportunities continued to be given priority during the Plan period. Educational facilities in rural areas were expanded and

TABLE 10-1
STUDENT ENROLMENT IN LOCAL PUBLIC INSTITUTIONS,
1990-2000

Level of Education	Enrolment ¹						Increase (%)	
	1990	%	1995	%	2000	%	6MP	7MP
Pre-school	173,570	4.2	256,800	5.2	399,980	7.1	48.0	55.8
Primary²	2,445,600	59.2	2,766,870	56.1	2,922,860	51.5	13.1	5.6
Lower Secondary	943,920	22.8	1,124,910	22.8	1,279,020	22.5	19.2	13.7
Government & Government-aided Schools	942,800		1,122,180		1,264,620		19.0	12.7
MARA Junior Science Colleges	1,120		2,730		14,400		143.8	427.5
Upper Secondary	371,760	9.0	514,970	10.4	693,880	12.3	38.5	34.7
Government & Government-aided Schools	331,050		459,850		592,940		38.9	28.9
MARA Junior Science Colleges	9,770		6,320		11,500		-35.3	82.0
Vocational & Technical Schools	30,940		48,800		89,440		57.7	45.4
Post-Secondary	73,980	1.8	80,080	1.6	95,530	1.7	8.2	19.3
Government & Government-aided Schools	63,250		64,610		70,040		2.2	8.4
Pre-diploma & Pre-university Courses ³	10,730		15,470		25,490		44.2	64.8
Teacher Education (Non-graduates)	21,750	0.5	35,410	0.7	32,000	0.6	62.8	-9.6
Certificate	10,130	0.2	17,080	0.3	21,290	0.4	68.6	24.6
Diploma	32,020	0.8	46,930	1.0	61,900	1.1	46.6	31.9
Degree⁴	58,440	1.4	89,600⁵	1.8	167,900	3.0	53.3	87.4
Total	4,131,170	100.0	4,932,650	100.0	5,674,360	100.0	19.4	15.0

Notes:

¹ Enrolment refers to total student population in that particular year at the particular level of education.

² Includes Government and Government-aided schools.

³ Includes preparatory courses conducted at the Institut Teknologi MARA (ITM) and all universities excluding Universiti Teknologi Malaysia and enrolment of foreign students at the Universiti Islam Antarabangsa (UIA).

⁴ Includes enrolment in post-graduate courses in institutions of higher learning and enrolment in advanced diploma courses at the ITM, Kolej Tunku Abdul Rahman and off-campus courses at the Universiti Sains Malaysia and the ITM. Enrolment of foreign students at the UIA is excluded.

⁵ In 1995, about 50,600 students were enrolled at the degree level overseas and 6,100 students were enrolled at the degree level in local private institutions. Of the total overseas, 39.5 per cent were Government-sponsored students.

improved to provide a more comfortable and conducive learning environment. Efforts were also taken to provide small schools, with enrolment of less than 150 pupils, with better facilities such as new classrooms to replace dilapidated ones, library facilities, teaching and learning materials as well as trained teachers.

10.12 Hostel facilities continued to be provided in rural and remote areas to cater for students who lived far away from their schools, thereby, enabling them to have access to educational opportunities and a better learning environment. In addition, hostels were also built in urban areas to accommodate students from rural areas. With these hostel facilities, rural students were able to gain access to a more conducive learning environment and better learning facilities in urban areas. During the Plan period, hostel facilities were expanded to benefit about 59,330 primary school students. Furthermore, promising students from rural areas were also given opportunities to pursue their secondary education in fully residential schools. These schools provided students with better facilities as well as trained and experienced teachers who provided guidance and supervision.

10.13 Measures aimed at increasing participation of rural children and retaining them in the education system included the provision of financial assistance and textbooks-on-loan as well as health and nutrition programmes. During the period, RM182 million was spent on financial assistance for the poor and RM339.4 million was spent on the textbooks-on-loan programme which benefitted about 0.5 million and 2.6 million children, respectively. Another RM139.4 million was spent on the supplementary food programme for the poor which benefitted about 0.5 million children.

10.14 As an incentive to attract qualified and experienced teachers to serve in the rural and remote areas, more teachers' quarters were provided. During the Sixth Plan period, a total of 5,100 units of teachers' quarters was constructed benefitting about 5,250 teachers. However, the total units of quarters provided was still insufficient to fulfil the overall demand and the teacher-teachers' quarters ratio remained low at 1:0.07 during the Plan period. In addition, frequent transfers of teachers from rural to urban schools still persisted, particularly after teachers had served in rural areas for several years. This had slightly affected the quality of teaching in rural areas.

10.15 In order to provide quality education as well as greater access to education, the responsibility of providing education for the *Orang Asli* children was taken over by the Ministry of Education from the Department of *Orang Asli* in 1995. As a result, these children were provided with trained teachers, better school facilities as well as teaching and learning materials.

10.16 Efforts were also undertaken to provide greater access to education for disabled children and those with learning difficulties. In this regard, a special education programme was implemented in 26 special schools for the disabled and those with learning difficulties. In addition, under the inclusive education programme, children with hearing and sight impairment were enrolled with normal children in 139 schools. At the end of the Plan period, 7,090 disabled children were enrolled in such schools. Eleven new special schools with appropriate teaching and learning facilities for disabled children were under various stages of implementation.

10.17 Despite efforts to improve the overall academic performance of primary school students, gaps in students' achievements between rural and urban schools still remained. The results of the *Ujian Penilaian Sekolah Rendah* (UPSR) showed that the urban schools fared better. In addition, analysis on the level of achievement by subject in the 1995 UPSR showed that only 18.8 per cent of rural students scored excellent grades for the English language, while urban students achieved a relatively higher rate of 41.8 per cent. The attainment of excellent grades in mathematics among rural students was also relatively lower, where only 35.4 per cent of the rural students obtained excellent grades compared with 47.8 per cent for urban students.

10.18 In order to improve the academic performance of students, the Government continued to implement remedial education to improve the overall performance of slow learners and low achievers, particularly in the rural areas. Among the measures taken were the organization of students into separate groups based on their academic performance, the introduction of simpler and more effective teaching methods as well as the utilization of audio-visual aids. During the Plan period, efforts were undertaken to increase the number of remedial teachers by expanding in-service courses which were specifically designed for remedial education. In 1995, there was a total of 1,918 remedial teachers, reflecting a teacher-student ratio of 1:1,442 which was still below the targetted ratio of one remedial teacher for every 500 students.

Secondary Education

10.19 Enrolment at the secondary level in Government and Government-aided schools increased by 23.1 per cent from about 1.3 million in 1990 to about 1.6 million in 1995, as shown in *Table 10-1*. At the lower secondary level, enrolment increased by 19.2 per cent as a result of improvement in the transition

rate from primary to lower secondary from 83 per cent in 1990 to 84.5 per cent in 1995. Likewise, enrolment at the upper secondary level increased by 38.5 per cent as a result of the policy to gradually implement the extension of basic education from nine to 11 years. With the gradual implementation of the policy in the Sixth Plan, the transition rate from lower to upper secondary level improved from 68 per cent in 1990 to 83 per cent in 1995, while the participation rate at the upper secondary level increased from 50.4 per cent in 1990 to 63.7 per cent in 1995.

10.20 Continued emphasis was given to expanding facilities, increasing accessibility and reducing the dropout rate, so as to increase the enrolment ratio in line with the objective of achieving universal secondary education. Priority was also given towards improving the overall quality by increasing the number of the graduate teachers in secondary schools. Efforts were also taken to increase and improve the teaching and learning materials including textbooks.

10.21 During the Sixth Plan period, a total of 5,280 additional classrooms was planned for construction to cater for the increase in enrolment and to reduce overcrowding, particularly in urban schools. However, only 75 per cent or 3,960 classrooms were completed at the end of the Plan period. With the delay in the construction of new classrooms and the increase in enrolment, the class-classroom ratio improved slightly from 1:0.69 in 1990 to 1:0.75 in 1995. To overcome the shortage of classrooms, about half or 721 secondary schools continued to conduct classes in the afternoon. In addition, 14.3 per cent of these classes had more than 40 students per class.

10.22 Despite improvement measures being undertaken, there were still concerns with regard to student achievement and the proportion of students who chose science subjects at the upper secondary level. During the period, the percentage share of students at the upper secondary level in Government and Government-aided schools enrolled in the science and technical streams declined from 22.8 per cent in 1990 to 21.3 per cent in 1995. This enrolment level was still below the 60 per cent target of having upper secondary students enrolled in the science stream.

10.23 The academic performance in the *Sijil Pelajaran Malaysia* (SPM) examination, particularly of rural students, remained a major concern. The overall failure rate at the national level was 33.9 per cent in 1993 and 32.9 per cent in 1995. Of the total failures in 1995, 58.3 per cent were rural students.

Analysis of academic achievement by subject showed that more than half of the rural students failed in English and 38.5 per cent in mathematics. Among the rural students who sat for pure science subjects, 3.5 to 5.1 per cent achieved excellent grades compared with 9 to 12 per cent for urban students.

Technical and Vocational Education

10.24 Continued efforts were taken to expand the supply of skilled manpower through increased intake into the secondary technical and vocational schools. In 1995, there were nine secondary technical schools (STS) and 69 secondary vocational schools (SVS) compared with 58 SVS in 1990. The enrolment in these schools increased from 30,940 in 1990 to about 48,800 in 1995, while the output was 13,500 for STS and 82,700 for SVS. The majority of students from STS continued their studies in various institutions of higher learning, while SVS school leavers were mainly absorbed into the job market. The skill stream at SVS produced a total of 23,500 graduates which contributed to the supply of semi-skilled manpower.

10.25 In view of the need to increase more science and technical manpower, measures were taken to increase the supply of students with strong foundation in mathematics, science and technical-related subjects to enable them to enrol in science and technical courses at the tertiary level. In this regard, 20 SVS were converted into STS for the 1996 school session. With this conversion, the intake into the vocational and skill streams was reduced in these schools.

10.26 In order to provide opportunities for students in secondary schools to study engineering technology and engineering drawing, these subjects were also introduced in selected secondary schools. This move was to familiarize students with technical subjects and to instil an interest in as well as prepare them to continue their studies in various science and technology-related courses at the tertiary level.

Teacher Education

10.27 The teacher education programme was aimed at producing trained teachers for the primary and secondary levels. Emphasis was given to producing quality teachers who were innovative, dedicated, committed and strongly motivated.

In this regard, the teacher training curriculum and co-curricular activities focused on teaching methods and the acquisition of knowledge in various subjects, as well as emphasized the inculcation of positive values and discipline. In addition, beginning in 1994 computer courses were made compulsory to all trainees in teacher training colleges.

10.28 During the Plan period, a total of 48,090 non-graduate teachers was trained by the 31 teacher training colleges, while 22,770 graduate teachers were trained by these colleges and the universities. However, the number of trained teachers was inadequate to fulfil total requirements. In 1995, primary schools experienced a shortage of about 9,780 trained teachers. At the secondary level, the shortage was about 4,600 teachers, mainly in mathematics, English language and science subjects. The shortage was partly overcome through the recruitment of temporary teachers as well as reemployment of 2,930 retired teachers. The shortages and untrained teachers affected quality of teaching and delivery of education. In urban schools where the ratio of students per class was relatively higher than the rural schools, teachers were overburdened and stressed.

10.29 For secondary schools, the emphasis was to produce more graduate teachers so that only graduate teachers teach at the secondary level. Towards this end, a total of 20 teacher training colleges was given the responsibility to conduct the Post-Graduate Teacher Training Programme leading to the award of a Diploma in Education. Another seven colleges offered twinning programmes with local universities to enable serving teachers to obtain degree qualifications. In 1995, 50,670 or 58 per cent of the total secondary school teachers were graduates compared with 36 per cent in 1990. The Master Teacher concept was introduced in 1995, with the aim of acknowledging and rewarding outstanding teachers who had contributed significantly to improve school performance.

10.30 Efforts were taken to strengthen and upgrade knowledge and teaching skills in science and mathematics. In this regard, a total of 280 serving teachers were sent for training at the Regional Centre for Science and Mathematics in Pulau Pinang during the Plan period. To ensure that primary school teachers have a strong foundation in science and mathematics, a teacher training college was also established in 1994 in Bintulu, Sarawak, specifically to produce science and mathematics teachers for primary schools. In addition, trainees in all teacher training colleges were required to have a minimum of five credit passes with a pass in mathematics at the SPM level except those teaching Islamic studies, English and music.

10.31 Measures aimed at enhancing teaching skills of serving teachers were also carried out. During the Plan period, about 45 per cent of teachers at the primary and secondary levels attended in-service courses in various subjects. In addition to the four existing state education resource centres, 350 teacher activity centres were established at the district and school levels to provide facilities for teachers to improve teaching methods and to prepare teaching and learning materials through discussions and workshops.

Tertiary Education

10.32 In order to meet the manpower requirements of a rapidly growing economy, tertiary education in the Sixth Plan period was directed at increasing enrolment at the degree, diploma and certificate levels, particularly in science, medicine, engineering and technical-related courses. Efforts were undertaken to increase intake into local public institutions of higher learning by expanding physical facilities in existing campuses and establishing new universities, namely, the *Universiti Malaysia Sarawak* (UNIMAS) and the *Universiti Malaysia Sabah* (UMS). The permanent campuses of the *Universiti Islam Antarabangsa* (UIA) in Gombak, the teaching hospital of the *Universiti Kebangsaan Malaysia* (UKM) in Cheras and four new polytechnics in Dungun, Johor Bahru, Seberang Prai and Shah Alam were in various stages of implementation.

10.33 *Enrolment* at the degree, diploma and certificate levels increased by 52.7 per cent from 100,590 in 1990 to 153,610 in 1995. Of the total enrolment in 1995, 58.3 per cent were in the degree courses, 30.5 per cent in the diploma and the rest in certificate courses, as shown in *Table 10-1*. At the first degree level, the total enrolment of the combined science and technical streams increased from 41 per cent in 1990 to 45 per cent in 1995, as shown in *Table 10-2*. At the diploma level, a similar enrolment trend occurred, as shown in *Table 10-3*. In addition, opportunities for *Bumiputera* to pursue studies at the tertiary level were expanded at the *Institut Teknologi MARA* (ITM) where enrolment increased from 27,500 in 1990 to 32,480 in 1995.

10.34 With respect to the *output* from public institutions of higher learning, arts graduates exceeded science and technical graduates. During the Plan period, 58 per cent of the first degree graduates were in the arts stream compared with 63 per cent in the Fifth Plan period. Improvements in the enrolment and output of science and technical courses reflected the successful measures taken to increase enrolment in these courses.

TABLE 10-2

**ENROLMENT AND OUTPUT FOR FIRST DEGREE COURSES
FROM LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1990-2000**

Course	Enrolment				Increase (%)			Output		
	1990	%	1995 ¹	%	2000	%	6MP	%	7MP	%
Arts	31,220	59	43,610	55	70,970	49	28	58	54,090	50
Arts & Humanities ²	17,790		21,600		36,080		21		28,520	
Economics & Business ³	11,320		19,210		31,600		70		22,970	
Law	2,110		2,800		3,290		33		2,600	
Science	14,460	27	22,290	28	42,280	29	54	27	33,980	31
Medicine & Dentistry	2,380		2,580		5,230		8		3,030	
Agriculture & Related Sciences ⁴	1,610		3,260		4,330		102		1,400	
Pure Sciences ⁵	4,610		5,580		8,130		21		7,590	
Others ⁶	5,860		10,870		24,590		85		21,960	
Technical	7,130	14	13,430	17	31,450	22	88	15	20,010	19
Engineering	5,520		10,430		24,750		89		14,110	
Architecture & Town Planning	640		1,750		3,670		173		3,050	
Survey	300		460		1,130		53		700	
Others ⁷	670		790		1,900		18		2,150	
Total	52,810	100	79,330	100	144,700	100	50	100	108,080	100

Notes:

¹ It was estimated that a total of 50,600 students was enrolled in degree level courses abroad. Of this total, 18,300 were Government-sponsored students enrolled in first degree courses of whom 59.8 per cent were in science and technical courses.

² Includes art and design, Islamic studies, languages, library science, literature, Malay culture and social science.

³ Includes accountancy, agri-business, business management and resource economics.

⁴ Includes home science and human development.

⁵ Refers to biology, chemistry, mathematics and physics.

⁶ Includes applied science, environmental studies, food technology, pharmacy and science with education.

⁷ Includes property management.

TABLE 10-3

**ENROLMENT AND OUTPUT FOR DIPLOMA AND CERTIFICATE
COURSES FROM LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1990-2000**

Course	Enrolment			Increase (%)			Output		
	1990	%	1995	%	2000	%	6MP	%	7MP
DIPLOMA									
Arts	17,050	53	23,330	50	30,240	49	18,690	47	31,590
Arts & Humanities ¹	1,590		3,370		7,710		3,770		5,900
Economics & Business ²	15,460		19,960		22,530		14,920		25,690
Science	6,190	19	8,860	19	8,320	13	7,060	18	7,040
Agriculture & Related Sciences ³	2,290		1,690		1,490		2,130		1,180
Others ⁴	3,900		7,170		6,830		4,930		5,860
Technical	8,780	28	14,740	31	23,340	38	14,120	35	25,000
Engineering	6,010		11,040		17,790		11,620		19,780
Architecture & Town Planning	1,640		1,940		2,580		1,440		3,150
Survey	570		720		1,570		750		1,480
Others ⁵	560		1,040		1,400		310		590
Total	32,020	100	46,930	100	61,900	100	39,870	100	63,630
CERTIFICATE									
Arts	1,750	17	3,360	20	5,080	24	7,760	26	8,470
Arts & Humanities ¹	440		610		1,840		1,300		1,890
Economics & Business ²	1,310		2,750		3,240		6,460		6,580
Science	720	7	1,170	7	2,500	12	4,500	15	8,460
Pure Sciences ⁴	40		80		150		2010		350
Others ⁵	680		1,090		2,350		2,490		8,110
Technical	7,680	76	12,550	73	13,700	64	17,520	59	23,990
Engineering	6,450		10,880		11,900		15,350		20,220
Architecture & Town Planning	990		1,200		1,320		1,570		2,830
Survey	240		470		480		600		940
Total	10,150	100	17,080	100	21,280	100	29,780	100	40,920

Notes:

- ¹ Includes music, photography, public administration and secretarial studies.
- ² Includes accountancy, banking and hotel management & catering.
- ³ Includes home science and human development.
- ⁴ Includes biology, chemistry, mathematics and physics.
- ⁵ Includes applied sciences, computer studies and environmental studies.
- ⁶ Includes property management.

10.35 The *intake* into the first degree level courses increased from about 11,000 in 1990 to 17,000 in 1995. The limited capacity of public local institutions resulted in only about 50 per cent of applicants being admitted into degree level courses. The number of those in the 19-24 age-group enrolled at the first degree level remained small at about 3.5 per cent in 1995. Although this rate showed a slight improvement from only 2.6 per cent in 1990, the enrolment rate of 3.5 per cent was very much lower than that in the developed countries.

10.36 During the Plan period, a sizeable number of Malaysian students continued their studies abroad. In 1995, an estimated 50,600 Malaysian students or 20 per cent of students in tertiary education were enrolled in various institutions overseas. Of this total, about 20,000 or 39.5 per cent were Government-sponsored students. Among this group, 18,300 were first degree students, of whom, 59.8 per cent pursued science, medicine, engineering and technical-related courses.

Training Programmes

Skill Training

10.37 Skill training programmes were directed at producing adequate supply of skilled workers, particularly to meet the needs of the expanding industrial sector. During the Plan period, public training institutions continued to be the main source of supply of skilled workers. Various measures were taken to increase training capacity through the expansion of existing facilities and the establishment of new institutions. The intake of trainees was also increased through the introduction of double-shift training sessions and the implementation of weekend classes. These measures resulted in an increase in the intake of trainees from 22,220 in 1990 to 43,100 in 1995, as shown in *Table 10-4*. During the Plan period, the output of skilled and semi-skilled manpower from local public training institutions totalled 145,670. Of the total, 92,250 trainees or 63.3 per cent were in the engineering trades and 11 per cent in the building trades.

10.38 To meet the needs for higher skilled manpower in new skill areas at the higher level and to take advantage of advanced technology in developed countries, advanced skill training institutes were established with the cooperation of the Federal Republic of Germany, France and Japan. The German-Malaysian Institute (GMI), established in 1992, offered advanced skill training, particularly in production technology and industrial electronics. The Institute, with a maximum enrolment capacity of 450 trainees, produced its first batch of 57

TABLE 10-4
INTAKE AND OUTPUT OF SKILLED AND SEMI-SKILLED MANPOWER
BY COURSE FROM LOCAL PUBLIC TRAINING INSTITUTIONS, 1990-2000

Course	Intake			Increase (%)		Output	
	1990	1995	2000	6MP	7MP	6MP	7MP
Engineering Trades	15,540	28,720	22,960	84.8	-20.1	92,250	114,970
Mechanical ¹	9,960	15,650	12,140	57.1	-22.4	52,510	59,310
Electrical ²	5,390	11,890	10,620	120.6	-10.7	38,590	34,480
Civil ³	190	1,180	200	121.1	-83.1	1,150	1,180
Building Trades ⁴	2,770	3,800	3,910	37.2	2.9	16,060	19,770
Printing Trades ⁵	30	160	3,090	433.3	1,831.3	320	11,960
Commerce	2,290	5,130	7,060	124.0	37.6	15,440	13,500
Agriculture	420	390	0	-7.1	-100.0	1,870	760
Others ⁶	1,070	3,310	7,200	209.3	117.5	16,230	34,250
Skill-upgrading	100	1,590	1,500	1,490.0	-5.7	3,500	4,800
Total	22,220	43,100	45,720	94.0	6.1	145,670	200,010

Notes:

¹ Includes general mechanics, general machining, tool & die making, motor vehicle mechanics, welding, sheet metals works and fabrication.

² Includes electrical installation & maintenance, radio & television servicing, refrigeration & air conditioning, electrical fitting & armature winding and electronic engineering.

³ Includes construction.

⁴ Includes carpentry & joinery, woodwork machining, bricklaying and plumbing.

⁵ Includes hand composing, machine composing, offset printing and bookbinding & letterpress.

⁶ Includes surveying, architectural draftsmanship, photography, laboratory science, dispensing optics, computer programming, information processing, heavy plant operation, architecture, quantity surveying, hotel and catering, and home economics.

graduates in 1995. The Malaysia-France Institute, which began operation in October 1995, had a capacity of 600 trainees and offered courses at advanced level in areas such as maintenance of automated mechanical system and machine, electrical equipment installation and welding technology. In addition, the establishment of the Japan-Malaysian Technical Institute (JMTI) was at the planning stage.

10.39 The National Vocational Training Council (NVTC) reviewed existing trade skills standards with the private sector. As a result of this review, the National Occupational Skill Standards (NOSS) was introduced to replace the National Trade Skill Standards (NTSS). By the end of the Plan period, a total of 42 NOSS covering trades from Levels 1 to 3 was completed. A new certification scheme, the *Sijil Kemahiran Malaysia* (SKM), which included the accreditation of prior learning and achievement was introduced by NVTC in 1993. The new system gave recognition to skills acquired through training and job experience. During the period, the certification scheme covered Levels 1, 2 and 3 of the SKM. The development of NOSS and the introduction of the new certification scheme were in line with the objective of producing skilled manpower in accordance with industrial requirement as well as ensuring graduates from training institutions possessed the required competency in the related skill areas.

10.40 Promotional programmes were also conducted by the various training institutions to provide information to the public on training programmes offered, as well as career opportunities and prospects in skill occupations. These promotional activities included video presentations, road shows and exhibitions, organized visits to training institutions, briefing sessions to secondary school students, publications and dissemination of relevant information through the mass media, information centres and selected public places. At the national level, skill competitions were held annually with the objective of promoting creativity among trainees, and exposing the public to the range of skill areas and career prospects available. The 60 per cent increase in the number of applicants for places in MARA skill training institutes during the Plan period was partly attributed to the success of these promotional activities. A similar trend was also experienced by other training institutions.

Management Training

10.41 Training programmes for public sector personnel focused on the upgrading of managerial capability, improving efficiency and increasing productivity of the public service. During the Plan period, the National Institute of Public

Administration (INTAN) which was the main provider of training for public services personnel trained a total of 103,000 personnel. Of the total, 67 per cent were in the administrative and managerial group. In addition, a total of 2,715 Government officials was sent overseas to continue their studies at the post-graduate level in various fields. In line with the Malaysia Incorporated policy, several programmes aimed at promoting closer rapport between the public and private sector personnel were carried out with the cooperation of European and American firms. Selected Government officials were exposed to corporate management in the private sector through training programmes and attachments with foreign firms abroad. During the Sixth Plan period, 67 officers participated in the British Malaysia Industry and Trade Association (BMITA) programme, while 51 benefitted from the European and American modules.

10.42 During the Plan period, in-service training was also conducted by specialized training institutes for public sector officials. In-service courses for about 95,300 education personnel were conducted by the *Institut Aminuddin Baki* (IAB). In addition, in-service courses to upgrade professionalism and improve diplomatic skills among the diplomatic and foreign relations practitioners were conducted at the Institute of Diplomacy and Foreign Relations (IDFR). A total of 4,200 officials, including 255 foreign diplomats from various developing countries, was trained at the IDFR.

10.43 Training for engineering professionals and technicians was carried out by the *Institut Kerja Raya Malaysia* (IKRAM) for a total of 21,850 personnel from the Public Works Department. Training for 159 evaluation personnel of the Evaluation Department was also conducted at the National Evaluation Institute (INSPEN). Other specific training programmes included training for 3,750 Customs and Immigration officials.

Information Technology in Education

10.44 During the Sixth Plan period, a computer literacy programme was launched with the objective of exposing students to basic knowledge in computer literacy. At the primary level, the computer-assisted teaching and learning programme was implemented in 1994 as a pilot project for students in Standards IV, V and VI in 15 schools in the State of Selangor. Computer software for mathematics and the English language were developed, while software for other subjects were in the planning stage. An assessment of the Standard V student performance in mathematics, carried out by the Ministry of Education, indicated that the programme had facilitated students in acquiring competency in mathematics.

10.45 A pilot project in computer literacy for the secondary level was implemented in 60 secondary schools in rural areas. The computer literacy subject which was offered to Forms I and II students in these schools provided basic computer knowledge and application as well as data and word processing. Students in the secondary technical schools were also taught computer application in designing, manufacturing and programming.

10.46 Besides developing computer programmes for learning and teaching purposes, schools were also encouraged to set up computer clubs as part of the co-curricular activities with the cooperation of the Parent-Teacher Associations (PTAs) and the private sector. As part of the computer literacy programme, the usage of computers in teacher training colleges was intensified. Beginning in 1994, computer courses were made compulsory to all trainees in teacher training colleges.

10.47 Measures were also taken to develop a management information system for the Ministry of Education and its related departments. A study is being carried out to develop the Education Management Information System (EMIS) which will result in computer networking within the Ministry of Education and with the various state education departments, teacher training colleges, state education resource centres, teacher activity centres and schools. In addition, similar efforts were undertaken by local universities and training institutions to develop a comprehensive computer network with adequate linkages within campus, between campuses as well as access to international information through the Joint Advanced Research Integrated Networking (JARING) network.

Participation of the Private Sector in Education and Training

10.48 Government efforts in expanding education and training facilities at all levels were supplemented by the private sector. At the primary level, enrolment in private schools increased by 106.4 per cent from 12,140 in 1990 to 25,060 in 1995. The enrolment in private religious schools increased from 4,020 in 1990 to 6,400 in 1995. The enrolment in private religious primary schools constituted 25.5 per cent of the total enrolment of private primary schools. Enrolment in the private secondary schools increased by 47.6 per cent from 110,700 in 1990 to 163,400 in 1995. Of the total enrolment in 1995, enrolment in the private religious schools constituted 42.2 per cent, while enrolment in the Chinese private schools constituted 36.8 per cent.

10.49 The participation of the private sector was more prominent in tertiary education where courses, mainly in applied arts, were offered at the certificate, diploma and degree levels. At the degree level, courses were offered mainly through twinning programmes with foreign institutions. During the Plan period, two medical colleges were established by the private sector to provide degree courses. In addition, public corporations such as *Tenaga Nasional Berhad* (TNB) and *Telekom Malaysia Berhad* (TMB) also conducted courses at the tertiary level focusing on engineering and information technology. The provision of facilities by the private sector for tertiary education resulted in an increase in enrolment from 42,680 in 1990 to 50,840 in 1995. The enrolment in 1995 constituted 25 per cent of total enrolment in tertiary education in local public and private institutions.

10.50 The private sector's role in supplementing Government efforts to expand skill training opportunities was further strengthened through the sector's continuous involvement in expanding and establishing skill training institutions. In 1995, there were 65 private skill training institutions compared with 25 in 1990. The courses offered were in areas such as mechanical, electrical and civil engineering, computer engineering and information technology. The output from private skill training institutions increased significantly from 3,260 in 1990 to 8,300 in 1995.

10.51 The involvement of private companies in skill training was further facilitated through the introduction of time sector privatization arrangement with public skill training institutions. Under this arrangement, various courses such as electro-mechanical, automated manufacturing and industrial electronics, were conducted in the evenings and during weekends for industrial workers. At the end of the Plan period, a total of 3,200 workers was trained in these institutions.

10.52 During the Plan period, several measures were taken to increase private sector participation in training programmes. The Human Resources Development Fund (HRDF), established in 1993, facilitated private companies in carrying out training for their employees. By the end of the Plan period, 639,100 industrial workers were trained in various training institutions, utilizing funds amounting to RM139.7 million. In 1995, the Human Resources Development Act was amended to enable the HRDF to be utilized for the training of employees in services sector activities such as tourism, hotel and catering, and shipping. The Act also enabled companies with less than 50 employees and a paid-up capital of more than RM2.5 million to participate in the HRDF.

10.53 Management training was also carried out by private sector institutions. In this regard, the Malaysian Institute of Management (MIM) trained about 325 administrative personnel from various organizations, while the National Productivity Corporation (NPC) trained a total of 37,400 personnel, of whom 48.5 per cent were supervisors from various private companies.

III. PROSPECTS, 1996-2000

10.54 In the Seventh Plan, the objective of education and skill training programmes will be to produce an adequate number of skilled and quality workforce to meet the manpower requirements of the country as well as to produce citizens who are disciplined and possess high moral values and good work ethics. Measures to be undertaken will include:-

- o increasing the capacity of existing institutions and establishing new ones, particularly in science, engineering and technical fields;*
- o strengthening the delivery system through the provision of qualified and experienced teachers and instructors, as well as greater utilization of modern technologies and computers so as to improve overall quality;*
- o improving accessibility in order to increase participation at all levels through the expansion of physical facilities and the distance learning programme;*
- o improving the management and implementation of education and training programmes through enhancing managerial capability as well as strengthening the monitoring and evaluation system;*
- o expanding tertiary education facilities to produce more professional manpower as well as improving the financial management and operation of tertiary institutions through corporatization and other means;*
- o strengthening research and development (R&D) within the existing institutions of higher learning as well as collaborating with local and foreign R&D institutions;*
- o increasing science and technical manpower, particularly in R&D;*
- o providing appropriate incentives to increase enrolment in the science stream;*

- o improving educational facilities in rural areas so as to reduce dropouts from the school system, while at the same time improving the performance of rural children;*
- o amalgamating small schools with less than 150 pupils in rural and remote areas into new school complexes to optimize the utilization of facilities and providing the students with better educational and hostel facilities;*
- o inculcating positive values and the right attitudes as well as innovativeness, communication and analytical skills among students and trainees;*
- o improving teachers' morale and performances by reviewing their certification schemes and providing incentives, identifying appropriate awards and giving recognition to dedicated teachers as well as improving teachers' welfare;*
- o encouraging reemployment of retired teachers to overcome shortages in critical subjects;*
- o strengthening the use of Bahasa Malaysia as the medium of instruction in all schools and institutions of higher learning, while at the same time increasing competency in the English language; and*
- o encouraging more private sector investment in education and training to complement public sector efforts.*

Education Programmes

10.55 Expansion of physical facilities will be undertaken at all levels of education, mainly to cater for the increase in enrolment and to create a more conducive learning and teaching environment. At the degree level, greater efforts will be taken to increase enrolment, particularly in science and technical courses. The private sector will also play an increasing role in the development of higher education.

10.56 During the Plan period, the Government will accelerate the construction of new schools and teachers' quarters. In this regard, the design of school buildings and standard of finishes will be improved, while the construction of schools in housing estates will be made the responsibility of the developer.

10.57 Various programmes aimed at improving the quality of education will be undertaken. These include reviewing the curriculum content and giving more emphasis to the teaching of science, mathematics and technical-related subjects, and upgrading the training of teachers to enhance their skills and knowledge. Qualities such as tolerance and respect for each other's values as well as the spirit of voluntarism will also be emphasized in the curricular and co-curricular activities. The curriculum for Islamic knowledge at all levels of education will be reviewed so as to give greater emphasis to the inculcation of good ethics and high moral values among Muslim students.

10.58 The Government will progressively implement single session schools in order to have a more structured and organized implementation of curricular and co-curricular activities. The extended contact hours between teachers and students in schools will provide the opportunity for conducting extra lessons in important subjects such as computer education, mathematics and science. In addition, single session schools will allow for more effective implementation of the Islamic curriculum, enhance learning in schools as well as minimize students' involvement in unhealthy activities.

10.59 Measures will be undertaken to inculcate awareness among parents on the importance of balanced education, the need to support the educational development of their children as well as their participation in school activities. Towards this end, the effectiveness of the PTAs will be further strengthened by increasing activities to attract participation of parents, such as seminars related to children's academic and moral development and parenting courses to inculcate skills among parents in dealing with their children's development. In addition, greater collaboration between teachers, parents and the community will be undertaken to assist in finding solutions to specific problems related to academic performance and discipline.

10.60 To increase the effectiveness of the education system and to strengthen the regulatory framework, a new Act called the Education Act, 1996 was enacted. Among others, the Act will strengthen the concept of a national system of education by including all levels and types of education and bringing within its ambit, pre-school, post-secondary and special education. At the primary and secondary levels, public and private educational institutions will be required to use the national curriculum.

10.61 The Education Act, 1996 will introduce a more flexible approach to the duration of primary schooling between five to seven years. In addition, a

study will be undertaken to determine the possibility of lowering the entry age of children into the primary level from age six to five. This will enable students to complete secondary education and pursue tertiary education or enter the labour market at a younger age.

Pre-school Education

10.62 Pre-school education will be further strengthened during the Seventh Plan to ensure participation of at least 65 per cent of children in the 5-6 age-group. A comprehensive policy will be formulated for the development of pre-school education, covering major aspects such as curriculum, physical facilities and teacher training. With this policy, coordination and quality of pre-school education in the public and private sectors will be further improved.

10.63 The private sector, including NGOs, will be encouraged to provide more pre-school facilities, particularly in the urban peripheries and rural areas. Efforts will be undertaken to increase awareness of parents on the importance of pre-school education in their children's development. In this regard, greater parental involvement in their children's education will be encouraged.

Primary Education

10.64 The main focus of primary education in the Seventh Plan period will be to expand school facilities, particularly in rural areas, and to develop a strong foundation in mathematics, science and English as well as good ethics and discipline among school children. In order to ensure that universal primary education is enhanced, additional classrooms will be built to accommodate the expected increase in enrolment from 2.8 million in 1995 to 2.9 million in the year 2000, as shown in *Table 10-1*. The additional 9,140 classrooms will further improve the class-classroom ratio from 1:0.86 in 1995 to 1:0.90 by the year 2000. The improvement in the ratio implies that the percentage of classrooms utilized in the afternoon will be reduced from 14 per cent to 10 per cent during the Plan period. This is in line with the policy to gradually phase out afternoon classes.

10.65 In order to improve the quality of education in rural and remote areas, as well as reduce the dropout rate, the Government will amalgamate small schools with less than 150 pupils and place the students in new school complexes. These complexes will be equipped with better school facilities,

trained and experienced teachers and students' accommodation. Measures will also be undertaken to introduce new school concepts such as emplacing primary students from Standards IV to VI in under-enrolled schools into selected schools which are equipped with boarding facilities and setting up primary and secondary schools in the same compound.

10.66 With regard to the teaching of mathematics, the new mathematics syllabus will be extended to Standards II, III, V and VI and fully implemented by 1997. To improve the overall student performance in mathematics, emphasis will be given to the development of new teaching methods. The new syllabus, which gives more emphasis to practical experience and utilization of various materials in teaching, will facilitate greater understanding of the subject and retain students' interest. In this regard, teaching and learning methods will also be improved so as to enable students to better comprehend the subject. Simultaneously, efforts will also be undertaken to effectively implement the programme of incorporating elements of science in Standard I to Standard III and as a separate subject for Standards IV to VI. Other measures to be taken include improving textbooks and teaching skills as well as expanding remedial education for slow learners and low achievers. In view of the need to improve competency in the English language, a total of 1,500 serving English language teachers will be retrained to upgrade their skills through twinning programmes with a consortium of British institutions of higher learning.

Secondary Education

10.67 Enrolment at the secondary level in Government and Government-aided schools is expected to increase by 25 per cent from about 1.6 million in 1995 to about 2.0 million in the year 2000, as shown in *Table 10-1*. The increase will be more significant at the upper secondary level with the extension of basic education from nine to 11 years. In order to accommodate the increase in enrolment and to reduce overcrowding, as well as to replace dilapidated classrooms, a total of 9,770 new classrooms will be built.

10.68 Efforts will be intensified during the Seventh Plan period to increase the number of students taking science and mathematics. In order to increase students' interest as well as improve their performance in these subjects, teaching methods which are simple, practical and interesting will continue to be used. Appropriate incentives will be provided to science students so as to increase enrolment in the science stream. Counselling and career guidance will

be intensified to encourage students to pursue science and technical electives. In addition, mathematics and science camps, competitions and exhibitions will be organized. A new topic, *Invention*, will be incorporated in the Living Skills subject at the lower secondary level beginning in the 1996 school session, with the objective of producing students who are creative, innovative and inventive. Other aspects include using computer packages in the teaching and learning of mathematics and science. Steps to update the contents of mathematics and science textbooks in order to take into account the latest technological development and increase reading materials in science, will also be undertaken.

10.69 Greater efforts will be taken to improve the overall academic performance of secondary school students. Priority will be given to improve student competency in *Bahasa Malaysia*, while continued efforts will be made to improve the teaching of English as a second language as well as students' analytical ability. The use of computers in secondary schools will be extensively promoted to build a strong foundation for a computer literate society.

10.70 With the full implementation of 11 years basic education, there will be continuous progression of students from Standard I to Form V. In this regard, extensive monitoring and evaluation of students' performance at all levels will be undertaken, including greater use of the Criterion Reference Test, which will further develop new teaching and learning approaches, as well as enhance students' academic performance, particularly in the early years of schooling. This will enable early detection of slow learners and low achievers and remedial measures be implemented to improve their performance. These measures will also motivate students to strive for excellence and contribute towards increasing the success rates at various levels.

Secondary Technical Education

10.71 Secondary technical education is aimed at producing an adequate pool of qualified students who excel in mathematics and science as well as in basic engineering subjects. These students are expected to continue their studies in the science and technology-related courses at the diploma and degree levels as well as in advanced skills.

10.72 With the critical shortage of engineers and skilled workers, the Government will launch a massive effort to convert all the 69 SVS to STS. The conversion of the 69 SVS will be completed when the ministries designated with the responsibilities for vocational training have developed adequate capacities

to take over fully this function from the Ministry of Education. By the year 2000, all STSs are expected to have a total enrolment of 89,440 students. In addition to the STS, engineering subjects will also be introduced in 15 fully residential schools and in selected secondary schools, benefitting a total of 7,000 students by the year 2000.

Teacher Education

10.73 During the Plan period, the main objective of teacher education will be to increase the supply of qualified teachers at the primary and secondary levels, particularly in mathematics, science and English language. The curriculum and co-curricular activities for teacher education will further emphasize the development of quality teachers who are not only knowledgeable and innovative, but highly-disciplined, strongly-motivated and dedicated.

10.74 Measures will be undertaken to improve teacher quality as well as to introduce appropriate incentives and facilities to enhance teachers' morale and to make the teaching profession more attractive. The measures include reviewing the remuneration and promotional schemes, determining appropriate allowances and facilities for teachers teaching critical subjects and those teaching in remote areas, and identifying appropriate awards to dedicated teachers. Opportunities for teachers to pursue studies at the diploma and degree levels will also be expanded. In this regard, headmasters of primary schools will have the opportunity of pursuing diploma level courses, while principals of secondary schools will have the opportunity of pursuing post-graduate courses. The level of teacher training for primary school teachers will also be upgraded from certificate to diploma level.

10.75 Several programmes will be implemented to increase the supply of trained teachers which include the construction of four new teacher training colleges, increasing intake into existing colleges and institutions of higher learning and expanding the Post-Graduate Teacher Training Programme. In order to increase the supply of graduate teachers at the secondary level, serving non-graduate teachers will be given the opportunity to continue their studies at the degree level. By the end of the Plan period, a total of 99,900 graduate and non-graduate teachers will be produced, thereby, alleviating existing shortages as well as fulfilling additional teacher requirements. Of the total, 62,050 teachers will be for primary schools, while the balance of 37,850 will be graduate teachers for secondary schools. The additional graduate teachers will increase the proportion of graduate teachers teaching at the secondary level from 58 per cent in 1995 to about 73.5 per cent in the year 2000.

10.76 Efforts to expedite the supply of experienced teachers and to overcome shortages in critical subjects will also be carried out through the reemployment of retired teachers. Towards this end, the Government will determine new terms and conditions of service for this group of teachers.

10.77 Steps will also be taken to continuously upgrade the knowledge of teachers and improve their teaching skills through the strengthening of in-service training programmes and enhancing the capabilities of teacher trainers. In addition, more opportunities will be given to teachers to develop their skills in school management. In this regard, more school management courses will be conducted at the IAB.

10.78 During the Plan period, provision of housing for teachers will be given priority, particularly in the rural and remote areas, in order to attract and retain qualified and experienced teachers in these areas. Teachers' quarters will also be built in selected urban areas where rental is high. In this regard, a total of 80,000 teachers' quarters is being planned to meet the demand for teachers' quarters.

Tertiary Education

10.79 The demand for an educated and skilled workforce will increase in tandem with the country's rapid industrialization. In view of this, the development of tertiary education during the Seventh Plan period will aim at the following:-

- o Increasing capacity to meet the growing local demand for higher education as well as developing higher education as an export industry;*
- o Improving quality and relevance of courses offered so as to match national manpower requirements;*
- o Increasing the enrolment at the first degree level in local public institutions for those in the 19-24 age-group from 3.5 per cent in 1995 to 5.6 per cent in the year 2000;*
- o Increasing the capacity of enrolment in the science, engineering and technical-related courses so as to intensify the production of manpower with science and technical knowledge;*
- o Increasing the capacity for post-graduate courses from 11.5 per cent of total enrolment at the degree level in 1995 to at least 14 per cent in the year 2000;*

- o *Increasing the capacity and capability to undertake research and development (R&D), particularly those which are relevant to industrial and services sectors' requirements; and*
- o *Increasing private sector participation to supplement Government efforts in expanding tertiary education opportunities, while at the same time helping to reduce the growing public expenditure on education.*

10.80 During the Plan period, the overall *enrolment* of full time students in public institutions of higher learning is expected to increase by 63.5 per cent, from about 153,600 in 1995 to 251,100 in the year 2000, as shown in *Table 10-1*. The distribution is expected to be 66.9 per cent for the degree level, 24.7 per cent for the diploma level and the rest for the certificate level. In this regard, the total enrolment in science and technical courses in institutions of higher learning will increase from 76,300 in 1995 to 132,050 by the year 2000. However, within the arts stream, the enrolment in applied arts courses will be adequate to meet manpower requirement for the services sector.

10.81 The *output* at the first degree level is expected to reach an equal proportion between arts and science and technical students. About 56.4 per cent of the science and technical graduates at the first degree level will be produced by *Universiti Pertanian Malaysia (UPM)*, *Universiti Teknologi Malaysia (UTM)* and *Universiti Sains Malaysia (USM)*, each having an output of 11,310, 10,120 and 9,010, respectively, as shown in *Table 10-5*. By the year 2000, it is expected that the combined total output of science and technical graduates both at the diploma and degree levels will be equal to that of arts graduates, as shown in *Tables 10-2 and 10-3*. This balance will be an improvement compared with the predominance of arts graduates in previous Plan periods. This new output trend is consistent with the policy to increase science and technical graduates.

10.82 The increase in enrolment will be accommodated through the expansion of existing institutions as well as the completion of new campuses, namely, the UTA in Gombak, the medical faculty of the UIA in Kuantan, UNIMAS in Samarahan and the UMS in Likas. Other new institutions include the ITM branch campuses in Machang, Merbok and Seberang Jaya, four new polytechnics in Dungun, Johor Bahru, Pulau Pinang and Shah Alam and the branch campuses of the *Kolej Tunku Abdul Rahman* in Pulau Pinang and Segamat. At the same time, facilities in existing institutions of higher learning will be expanded to

TABLE 10-5
OUTPUT FOR FIRST DEGREE COURSES FROM
LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1996-2000

Course	Output											Total
	UM	UKM	USM	UPM	UTM	UIA	UUM	UNIMAS	UMS	ITM	KTAR	
Arts	8,960	9,370	9,560	3,660	210	4,050	10,060	480	310	4,540	2,890	54,090
Arts & Humanities ¹	6,410	5,900	8,740	2,730	90	750	1,620	480	170	1,630	0	28,520
Economics & Business ²	2,020	3,160	820	830	120	2,150	8,320	0	140	2,520	2,890	22,970
Law	530	310	0	100	0	1,150	120	0	0	390	0	2,600
Science	4,490	3,890	6,170	9,130	3,640	1,210	1,410	810	230	800	2,200	33,980
Medicine & Dentistry	1,140	850	710	250	0	0	0	80	0	0	0	3,030
Agriculture & Related Sciences ³	0	0	0	1,160	0	0	0	210	30	0	0	1,400
Pure Sciences ⁴	0	2,310	0	2,820	0	0	0	0	80	180	2,200	7,590
Others ⁵	3,350	730	5,460	4,900	3,640	1,210	1,410	520	120	620	0	21,960
Technical	1,190	720	2,840	2,180	6,480	1,000	0	140	0	3,320	2,140	20,010
Engineering	1,190	720	2,120	1,880	3,960	700	0	140	0	1,760	1,640	14,110
Architecture & Town Planning	0	0	720	300	650	300	0	0	0	580	500	3,050
Survey	0	0	0	0	300	0	0	0	0	400	0	700
Others ⁶	0	0	0	0	1,570	0	0	0	0	580	0	2,150
Total	14,640	13,980	18,570	14,970	10,330	6,260	11,470	1,430	540	8,660	7,230	108,080

Notes:

¹ Includes Islamic studies, languages, literature, Malay culture, social science, library science, and art and design.

² Includes accountancy, business management, resource economics and agri-business.

³ Includes home science and human development.

⁴ Includes biology, chemistry, physics and mathematics.

⁵ Includes pharmacy, applied science, environmental studies, food technology and science with education.

⁶ Includes property management.

provide more places in the science, engineering and technology-related courses as well as in business, finance, accounting and information technology. By the year 2000, it is targetted that all universities, with the exception of UMS and UNIMAS, will each have 20,000 full-time students.

10.83 The participation of *Bumiputera* in tertiary education will be further increased through the expansion in capacity and the introduction of new courses at ITM. The enrolment at ITM is expected to increase from 32,480 students in 1995 to 52,500 students in the year 2000, with the major focus in science and technical-related courses as well as courses related to the services sector. The ITM will also intensify the implementation of twinning programmes with local and foreign institutions of higher learning to offer degree level courses. The post-graduate programme at ITM will give more emphasis to professional development and skills besides academic achievement.

10.84 During the Seventh Plan period, the *distance learning* programme, which is already in place on a modest scale in ITM, USM and UKM, will be further expanded and will also be implemented in other universities. The main objective of the programme is to provide more opportunities for those in the 19-24 age-group and those who are currently employed, to pursue tertiary level courses, particularly at the degree level. The programme will also include short courses aimed at upgrading the knowledge and skills of the workforce, particularly those at the managerial and supervisory levels. The programme will be better structured, more organized and carried out on a larger scale through closer cooperation between universities and the private sector. New areas of study, particularly in science, technology and management, will be introduced. Efforts will be taken to strengthen the programme and the implementing mechanism to enable it to be launched expeditiously. In implementing the programme, institutions of higher learning will coordinate efforts, share resources and facilities, and take advantage of the communication technology infrastructure that will be in place. In this regard, existing educational and training institutions nationwide will be selected and utilized as distance learning centres.

10.85 With the planned expansion of intake and enrolment in local public and private institutions, less Malaysian students will be sent overseas to pursue courses at the first degree level. Government-sponsored students at the post-graduate level will continue to be sent to universities overseas to pursue selected courses in the fields of science and technology, medicine and applied arts. The reduced dependence on foreign education and the expected increase in foreign students pursuing degree level courses in the country, will help to reduce the deficit in the balance of payments.

10.86 In order to increase R&D activities and to meet the increasing demand for higher qualified teaching staff, the capacity and enrolment for post-graduate and post-doctoral courses, particularly in the fields of science and technology, will be expanded. Enrolment at post-graduate level in local public institutions of higher learning is expected to increase from 11.5 per cent of total enrolment at the degree level in 1995 to at least 14 per cent in the year 2000. Of the total post-graduate students, 41.5 per cent will be in science and technology courses.

10.87 In order to produce appropriate and adequate supply of professionals, particularly in high-technology industrial and services sectors, public institutions of higher learning will introduce new courses and review existing courses in line with current and future requirements. New courses at first degree level will include marine engineering and industrial micro-biology, while at the post-graduate level, bio-mechanical engineering and manufacturing technology engineering as well as new medical courses such as bio-medicine, geriatric medicine and paediatric cardiology will be introduced. As part of the efforts to ensure graduates possess not only the required knowledge and skills but also high moral values, the curriculum and co-curricular activities will emphasize further the development of self-confidence and other positive values such as discipline and resilience.

10.88 With regard to the objective of promoting local institutions of higher learning as *centres of excellence* in R&D and consultancy services, efforts will be undertaken to strengthen R&D activities in areas such as information technology, microelectronics, advanced materials technology, advanced manufacturing, biotechnology, aerospace, energy and environmental-related technology, and communication technology. Institutions will identify specific areas of excellence which will become their focus of R&D and consultancy services in the next five years. Measures will also be undertaken to strengthen the implementation machinery for R&D and consultancy services as well as for the sharing of expertise and resources between faculties, universities and the private sector. During the Seventh Plan period, emphasis will also be given to promote greater cooperation between the Government and professional bodies, so as to ensure that all R&D activities as well as courses offered in the public institutions are recognized by and relevant to the needs of the private sector.

10.89 Public institutions of higher learning will take advantage of the existing *information technology (IT) infrastructure* by expanding usage in various IT-related areas. This will be carried out through more intensive use

of computers and other electronic means in teaching and learning processes. In addition, all public institutions of higher learning will establish electronic libraries to facilitate teaching staff and students to gain quick access to learning and reference materials. Electronic library facilities will be linked with research institutions and institutions of higher learning overseas through the JARING network.

10.90 A *reformation* in the higher education system will be undertaken to cope with the nation's changing demands and expectations. The reformation will emphasize institutional restructuring and formulation of regulatory measures to enable greater private sector participation. The reformation will also put in place the mechanism for improving coordination and ensuring the quality of education offered by the private sector.

10.91 As part of the reformation process, the University and University Colleges Act, 1971, which was amended in 1995, will enable public institutions of higher learning to be corporatized. The corporatization will provide them with greater autonomy to manage and operate their institutions in a more dynamic and proactive manner, as well as being responsive to changing needs and requirements. With this autonomy, institutions of higher learning will have greater flexibility in seeking their own revenue sources, increased capacity for consultancy services and commercialization of research findings as well as recruitment and remuneration of teaching staff.

10.92 The full implementation of the corporatization exercise is expected to gradually resolve the current problem of outflow of experts and experienced lecturers from public institutions of higher learning. These institutions, however, will still be guided by overall Government policy direction and objectives. The Government will ensure that these institutions will continue to be accessible to the low-income group and the disadvantaged by providing appropriate financial assistance.

10.93 The newly established Higher Education Council with members from both the public and private sectors will ensure greater coordination in planning and development of tertiary education during the Seventh Plan period. The Council will provide policy directions as well as plan and coordinate the development of all public and private institutions of higher learning. In addition, the Department of Higher Education, established in 1995, will be strengthened with relevant expertise to provide the necessary support to the Council.

10.94 In line with the national policy, the Government will expand and improve the use of *Bahasa Malaysia* as the medium of instruction. However, while emphasizing the use of *Bahasa Malaysia*, competency in other languages will also be encouraged, particularly the English language which is recognized as an international and commercial language. The establishment of private sector institutions of higher learning and the promotion of education as an export industry will further promote the use of the English language, particularly in private institutions. However, this development will not jeopardize the status and importance of *Bahasa Malaysia* as the national language. Malaysian students enrolled in private sector institutions will be required to study *Bahasa Malaysia*, while foreign students will also be encouraged to learn the language.

Training Programmes

Skill Training

10.95 During the Seventh Plan period, priority will be given to increasing the capacity for skill training, particularly in engineering and technical courses. In addition, efforts will be directed at improving the quality of training and introducing training in new skill areas as well as expanding advanced level courses. In this regard, the capacity of existing institutions will be expanded and facilities upgraded. New training institutions will be established to provide courses in new skill areas as well as advanced level courses. The private sector will be encouraged to establish more training institutions and to provide skill training for their workers.

10.96 In line with the objective to increase the capacity for training in new areas as well as in higher level skills, existing training institutions will be expanded to provide such courses. During the Plan period, nine new skill training institutes offering advanced level courses will be established, some with the cooperation of multi-national corporations. The new institutions include two advanced skill training centres in Johor Bahru and Klang, the JMTI in Pulau Pinang and the Japanese (Nippon) Malaysia Institute in Kulim. The courses offered will include new skill areas such as electronics, telecommunications and information technology, production technology, manufacturing of aircraft components, applied chemistry and instrumentation, and ship-building services and overhauling.

10.97 With the conversion of SVS to STS, the total intake into skill training institutions will increase marginally, by 6.1 per cent, as shown in *Table 10-4*. In order to provide opportunities for basic training for school dropouts and low

achievers, an allocation of RM409 million will be provided to establish an additional 72 *Pusat Giat* MARA, six national youth skill institutes and five industrial training institutes. By the end of the Plan period, a total of 200,000 skilled workers is expected to be produced by all public skill training institutions, as shown in *Table 10-4*.

10.98 Skill training through sponsorship programmes will be further strengthened. Towards this end, collaborative efforts between public training institutions and major privatized entities such as TNB and TMB will be encouraged. Local institutions of higher learning which offer technical courses such as UTM, ITM and KTAR will also be encouraged to develop collaborative efforts with public skill training institutions in conducting skill training programmes.

10.99 Efforts to promote technical skills will continue to be taken, in order to increase public awareness in skill training and attract school leavers to participate in skill training programmes. Appropriate promotional programmes such as public campaigns, advertisement, road shows and exhibitions will be organized on a larger scale to draw potential candidates, including those who perform well in the SPM examination. In this regard, a new *apprenticeship programme* will be developed to enable school leavers at the SPM level to be attached to industry while waiting for their SPM results. This short familiarization programme will benefit both trainees and employers as suitable candidates could be offered employment and further training.

10.100 In line with greater demand for higher level skills, urgent steps will be undertaken by NVTC to develop the NOSS for Levels 4 and 5. The curriculum for skill training will be revised by giving priority to high technology-related subjects, to commensurate with the demand in promoted industries such as machinery and engineering, aviation and aerospace, electronics and information technology.

10.101 Efforts will also be undertaken to increase the number of instructors in public training institutions. Although there was slight improvement in the remuneration scheme for instructors, it was still inadequate to attract and retain qualified and experienced instructors. Towards this end, a review will be undertaken to further improve the terms and conditions of service for instructors, including those on contract, so as to overcome the shortage in existing institutions as well as in newly established ones. A national instructor training programme will be implemented in the Centre for Instructor and Advance Skill Training to produce 200 instructors with higher level skills annually. Efforts will be undertaken by the respective ministries and training institutions to increase the recruitment of foreign instructors on a contract basis.

Management Training

10.102 Improvements in the quality and productivity of the public service is part of the Government's administrative reforms which will be emphasized during the Plan period. Towards this end, INTAN will further expand the training programmes for public sector personnel by conducting management courses in priority areas, appropriate to the current and future needs of the sector. These courses include Total Quality Management (TQM) and the ISO 9000 series of standards, advanced management programme for top management personnel, technology management, financial management as well as related computer courses. During the Plan period, INTAN will train about 150,000 public sector personnel. In addition, INTAN will upgrade existing computer courses to increase computer literacy among public sector personnel at all levels. To realize this, INTAN will upgrade its computer facilities as well as establish linkages with other training institutions.

10.103 Management skills in specific fields for public sector personnel will be intensified in the Seventh Plan. Management skills and knowledge of education personnel will be further enhanced through courses conducted by the IAB. In this regard, the IAB will intensify twinning programmes with local and foreign universities for management courses at the post-graduate level. These twinning programmes will concentrate on developing expertise in education management and proficiency in English.

10.104 Training for other public sector personnel, such as those involved in diplomatic relations, professional and technical fields, evaluation, customs and immigration, will continue to be provided by the respective training institutes. During the Plan period, a total of 7,200 diplomatic and foreign relations practitioners will be trained by the IDFR, 24,000 professionals and technical personnel will be trained by the IKRAM, while training for the Immigration and Customs personnel will involve 5,680 officials and staff. In addition, the range of training for evaluation personnel in INSPEN will be strengthened through the introduction of new courses such as information technology, property management and corporate management. Training for about 5,000 public sector personnel in the judicial and legal services will be carried out at the *Institut Latihan Kehakiman dan Perundangan* (ILKAP). With regard to training for public sector personnel involved in the administration and management of Islamic affairs, the *Institut Latihan Islam Malaysia* (ILIM) will be established during Plan period.

Information Technology in Education and Training

10.105 Computer literacy and computer-assisted teaching and learning programmes will be extended to all schools and training institutions during the next five years. The utilization of computers in educational and training institutions will enhance the teaching and learning processes and help overcome the problems of shortage of trained teachers and instructors in various subjects including languages. In this regard, efforts will be taken to acquire and develop the necessary software. The expansion of distance learning programme and the implementation of electronic libraries in institutions of higher learning will further enhance the usage of computers at the higher education level. The mode of delivery in the distance learning programme will be expanded through teleconferencing and electronic mail.

Participation of the Private Sector in Education and Training

10.106 The private sector is expected to play a more active role at all levels of education with the major expansion expected in higher education. In this regard, the Government will encourage the private sector to focus their efforts on the provision of science and technology-related courses. The implementation of the Private Higher Educational Institution Act, 1996 will enable the private sector to establish degree-granting institutions. It will also enable foreign universities to set up branch campuses in the country. This will further increase enrolment and output at the degree and diploma levels.

10.107 In order to supplement the efforts of the Government, public corporations and large privatized entities will be encouraged to expand their existing training facilities and establish new institutions of higher learning. In this regard, public corporations including *Petroleum Nasional Berhad* (PETRONAS), TNB and TMB are expected to increase the capacity of science and engineering-related courses at the degree level in their training institutions. The combined efforts of public and private training institutions in providing degree level courses will increase the participation rate of those in the 19-24 age-group to about 6.7 per cent in the year 2000, compared with 4.2 per cent in 1995.

10.108 With the expected increase in the number of private sector institutions offering tertiary education, there is a need to ensure that facilities and teaching are of high quality. Towards this end, a National Accreditation Board will be established to provide guidelines and standards for quality control.

10.109 The role of the private sector in providing skill training opportunities is also expected to increase substantially. The high cost of overseas training and the expanding market demand for skilled workers will encourage the private sector to establish training institutions and expand training programmes. The private sector companies are also expected to enhance their training activities through greater utilization of the HRDF and participation in skill development centres established by state governments. In addition, trade and industry associations will be encouraged to undertake industry-related skill training.

10.110 Private management training institutions, particularly the MIM, will intensify its efforts in conducting management courses. Towards this end, the Institute will expand courses at the diploma and degree levels through twinning programmes with foreign institutions of higher learning. In addition, the NPC will also provide more training opportunities for the managerial and supervisory category. During the Plan period, NPC is expected to train about 50,000 personnel, mostly from the private sector.

IV. ALLOCATION

10.111 The development allocation and expenditure for education and training during the Sixth Plan and the allocation for the Seventh Plan period are shown in *Table 10-6*. The allocation for education and training in the Seventh Plan amounts to RM10.1 billion or 15.4 per cent of the total public development allocation compared with 13 per cent in the Sixth Plan. Of the total allocation for the education sector, 45.6 per cent will be utilized to build new schools and additional classrooms for primary and secondary levels and another 35.1 per cent to expand the capacity for tertiary education, particularly at the degree level. The balance will be utilized to provide, among others, training facilities and housing for teachers as well as hostels for primary and secondary school students. Under the allocation for training programmes, RM1.3 billion or 78.4 per cent will be provided to establish new skill training institutes as well as upgrade and expand existing ones. The allocation for skill training which is double that of the previous Plan, is in line with the national training strategy to increase the output of skilled manpower, particularly at the advanced level and in new skill areas.

TABLE 10-6			
DEVELOPMENT ALLOCATION FOR EDUCATION AND TRAINING, 1991-2000 (RM million)			
<i>Programme</i>	<i>6MP</i>		<i>7MP</i>
	<i>Allocation</i>	<i>Expenditure</i>	<i>Allocation</i>
Education	7,409.8	6,982.1	8,437.2
Pre-school	61.8	58.0	107.4
Primary Education	1,184.7	1,127.1	1,396.0
Secondary Education	2,050.7	1,909.0	2,447.9
Government & Government-aided Schools	1,603.0	1,475.4	1,781.9
MARA Junior Science Colleges	28.7	28.7	367.0
Technical & Vocational Schools	419.0	404.9	299.0
Tertiary Education	3,139.3	3,039.4	2,961.8
Teacher Education	180.1	155.6	458.8
Other Educational Support Programmes	793.2	693.0	1,065.3
Training	615.4	581.0	1,661.6
Industrial Training	387.4	370.0	1,303.3
Commercial Training	14.0	14.0	66.3
Management Training	214.0	197.0	292.0
Total	8,025.2	7,563.1	10,098.8

V. CONCLUSION

10.112 During the Sixth Plan period, education and skill training programmes were expanded and further improved. These programmes contributed to growth and productivity, particularly in the industrial and services sectors. Aside from public sector programmes, there was greater private sector involvement in producing skilled workers to meet market demand. The Seventh Plan will continue to give priority to further expand facilities, increase accessibility and improve quality. The education and training programmes are expected to produce not only manpower who are knowledgeable, highly-skilled and computer literate, but also imbued with discipline, high moral values and good work ethics. In all these endeavours, the private sector will be an active partner in complementing the efforts undertaken by the Government.

