II.3 KHTP's Role in Regional Plan and National Objectives
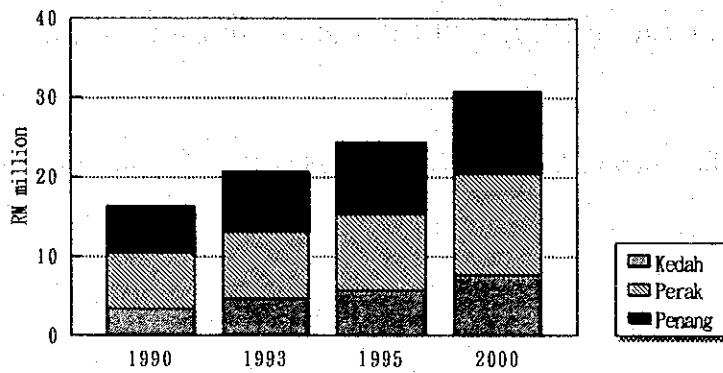
II.3.1 Current Situation of Economy and Development at the state of Kedah, Penang and Perak

(1) General

The population of the states of Kedah, Penang and Perak in 1995 are respectively 1,470,0000, 2,038,000 and 1,176,000, with their composition to the national population recorded at 7.4%, 10.2% and 5.9% respectively.   The increase ratio of population for the three states in 1995 are 5.1%, 3.2% and 3.7% respectively.   Compared with the national population growth rate of 4.2%, the growth rate of Kedah State is high (Figure II.3.1/Table II.3.1).
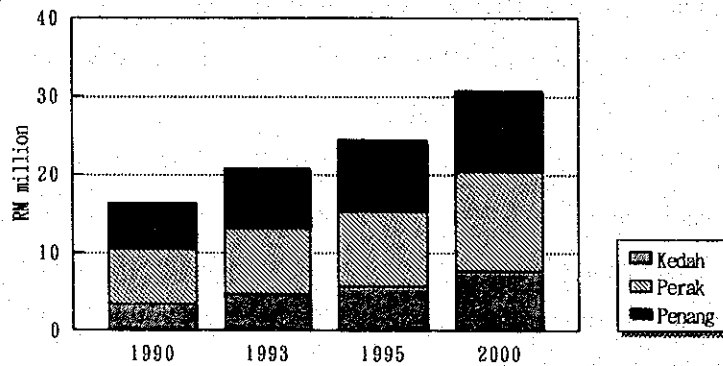
The growth rate of GDP in the states of Kedah and Penang for 1995 are respectively 9.1% and 8.2%, and had a higher growth rate than the national average of 8.1%.   In the case of Kedah State, this can be attributed to the contributions made by the manufacturing industry. By contrast, the growth rate for Perak State is 7.7%, which is lower than the national average (Figure II.3.1./Table II.3.1).

As for the GDP per capita in 1995 in terms of national average, the GDP for only Penang State is higher than the national average at 130%. By contrast, the GDP for Kedah State and Perak State are both lower than the national average at 65% and 82% respectively. However, with the passage of time, the states of Kedah, Penang and Perak have shown slight improvements (Figure II.3.3/Table II.3.1).
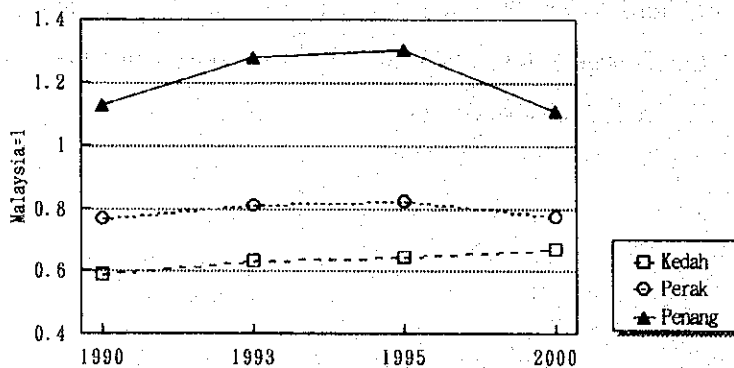
Figure II.3.1   Population Transition in the States of Kedah, Penang and Perak

Figure II.3.2   Transition of GDP in the States of Kedah, Penang and Perak

Figure II.3.3 Transition of Per capita GDP in the States of Kedah, Penang and Perak

	Population (Thousand People)				GDP at Purchasers' Value (RMm)				Per Capita GDP(RM)			
	Kedah	Perak	Penang	Malaysia	Kedah	Perak	Penang	Malaysia	Kedah	Perak	Penang	Malaysia
1990	1,366.9	2,098.1	1,159.0	18,010.2	3,554.2	7,042.9	5,719.0	79,102.6	2,600.2	3,356.8	4,934.4	4,392.1
1993	1,409.4	1,999.0	1,141.0	19,047.0	4,689.0	8,449.0	7,677.0	100,475.0	3,327.0	4,252.0	6,728.0	5,275.0
1995	1,470.2	2,038.2	1,176.4	19,959.0	5,585.0	9,860.0	8,995.0	117,265.0	3,799.0	4,838.0	7,646.0	5,875.0
2000	1,666.1	2,403.1	1,357.8	22,660.0	7,696.5	12,774.6	10,312.1	155,778.4	4,619.5	5,315.9	7,594.7	6,874.6

Source : 1) 1990 & 2000 :Source-The Second Outline Perspective Plan
       : 2) 1993 & 1995 :Source-The Mid-Term Review of the Sixth Malaysia Plan

(2) Current situation of Economic Development in Kedah State

The economy of Kedah State continues to show high growth. Compared to 1993, the growth for 1994 was 9.9%, compared with the national average of 8.1%. This growth was attributed to the conspicuous growth in by the manufacturing sector which posted a 19% growth in 1994 compared to the year before.

Manufacturing and agriculture, forestry and fishing industries account for 30.9% and 25.9% respectively of all industries.   These two industries alone dominate close to 60% of all industries. The agriculture, forestry and fishing industry, the math industries in Kedah State, in 1985 accounted for 42.4% of all industries in the state.   However, its weight in all industries has declined each year.   By contrast, the manufacturing industry in the period from 1985 to 1990 registered an average growth rate of 12.4%.   Also, since 1990, this sector has grown by around 20%, showing the turbulent changes in industrial structure (Table II.3.2).

Table II.3.2   Transition of Major Industries in Kedah State

(RM million)

	1985	1990	Gross rate	1991	Gross rate	1992	Gross rate	1993	Gross rate	1994	Gross rate
Agriculture,Forestry and Fishing Industry (share)	1,069	1,202	2.4	1,252	4.2	1,280	2.2	1,338	4.5	1,358	1.5
(share)	(42.4)	(33.2)		(31.2)		(29.5)		(28.0)		(25.9)	
Manufacturing	340	759	12.4	953	25.6	1,138	19.4	1,365	19.9	1,624	19.0
(share)	(13.5)	(20.9)		(24.1)		(26.2)		(28.6)		(30.9)	
Total,including others (share)	2,519	3,618	7.5	3,961	9.4	4,339	9.5	4,779	10.1	5,252	9.9
(share)	(100.0)	(100.0)		(100.0)		(100.0)		(100.0)		(100.0)	

Note : The Growth rate of 1990 shows the average from 1985. The other show the rate to the preceding year.
Source :Economic Planning Unit(EPU) & Kedah State Economic Planning (SEPU)

The progress in industrialization as mentioned above was the result of the state government's policy for developing industrial parks.   The total land area of industrial parks developed by Kedah State Economic Development Corporation (PKNK), Kedah Regional Development Authority (KEDA), and the private sector totaled 1,410 hectares as of 1994 (Table II.3.3).

In addition, there are plans to develop additional 2,562 hectares of industrial parks by the year 2000. The number of workers employed by located in these industrial parks totaled about 54,000 in 1994, or around 4% of the state's total population of 1,435,000 (Table II.3.4).

Table II.3.3   Industrial Parks in Kedah State (As of 1994)

Name	Total Planned Area Excluding Housing (ha)
PKNK Industrial Estates	
Mergong 1 and 2	61.0
Mergong Barrage	40.6
Bakar Arang	226.0
Sungai Petani LPK	251.0
Tikam Batu	36.0
Kulim	174.0
Sub-Total	788.6 (55.9%)
KEDA Industrial Estates	
Binjal	4.0
Baling	3.0
Baling Batu 42	4.0
Sik	12.5
Jeniang/Kg.Berjaya	10.7
Naka	5.7
Pokok Sena	5.0
Sungai Tiang	0.5
Langkawi	3.4
Langkawi	8.0
Sub-Total	56.8 (4.1%)
PRIVATE Industrial Estates	
Bandar Darul Aman	87.4
Perwaja Steel Mill	466.0
Sungai Petani Light	11.4
Sub-Total	56.8 (40%)
TOTAL(STATE)	1,410.2

Source:Industrial Zoning Study Kedah Darul Aman (Interim Report)

Table II.3.4   Employment in Industrial Estates in Kedah State (1987-1994)

(Thousand People)

Industrial Estate	End-year Employment (Number)							
	1987	1988	1989	1990	1991	1992	1993	1994
A PKNK Estates								
Kulim	9,108	10,038	13,795	14,667	18,507	16,219	16,949	17,099
IPK Sungai Petani	–	–	–	168	1,590	2,103	3,352	5,034
Bakar Arang	5,667	7,669	9,398	18,289	19,647	20,799	19,520	20,799
Tikam Batu	903	792	854	2,621	2,674	3,110	3,418	3,430
Mergong 11	1,203	1,203	1,378	1,428	1,428	1,428	1,428	1,428
Mergong Barrage	512	508	596	596	671	671	1,788	1,788
Total (PKNK Estates)	17,393	20,210	26,021	37,769	44,517	44,330	46,455	49,578
B PRIVATE								
Bandar Darul Aman(Jitra)	–	–	–	981	1,533	2,033	2,268	2,268
C KEDA								
MN Industrial Estate		–	210	869	2,378	1,992	2,014	2,040
Total (All Estate)	17,393	20,210	26,231	39,619	48,428	48,355	50,737	53,886

Source: Kedah State Ecomic Planning Unit Rapid Survey of Industrial Estate, Febraury, 1992,
PKNK, KEDAH, Bandar Darul Aman, September, 1994.

In addition, the following industrial development policies are being emphasized in Kedah State.

- Kulim High Tech Park: The largest project in the industrial sector is the Kulim Hi-Tech Park. At present, the first phase project for 250 hectares is being promoted by the KSDC. Firms from Taiwan and Australia have decided to locate plants in the park.

- New development projects for industrial parks in the central and northern belt regions: Construction of new industrial parks are being planned for Sungai Petani, Gurun Yan, Baling, Kota Setar, and Kubang Pasu.

- Kedah Skill and Management Development Center (KISMEC): As a training centre for higher skills; state and federal governments and private organizations in Kedah jointly launched the centre from October 1993. The centre is planning to locate in KHTP within a plot of land scheduled for a university. The size of the establishment is around 20 hectares (50 acres).

- Promotion of small and medium sized enterprises for using local resources: The aim is to promote small and medium-scale enterprises by employing such regional resources as lumber, rubber trees, rubber tree sap, limestone, marble, grain flour, and wheat straw.

- Expansion of the Perwaja Steel Mill: Expansion is planned for the Perwaja Steel Mill which was built in 1994 and is currently producing steel frames at 400,000 tons per annual output.

(3) Current situation of Economic Development in Penang State

The sector that drives economic growth in Penang State is the manufacturing industry which accounts for 55% of Penang's GDP, and also more than 40% of total employees. (Table II.3.5).

Table II.3.5   Transition of Manufacturing Industry in Penang State

	1973	1975	1980	1985	1990	1993
No. of Factories	73	106	132	276	503	637
	(-)	(20.5)	(4.5)	(15.9)	(12.8)	(8.2)
No. of Employees	23.4	31.9	50.7	59.6	115.3	162.9
(thousand people)	(-)	(16.8)	(9.7)	(3.3)	(14.1)	(12.2)
Amount of Investment	149	304	580	580	1,822	3,990
(RM million)	(-)	(42.8)	(13.8)	(14.8)	(9.5)	(29.8)

Note:( ) shows the average growth rate.
Source :Penang into the 21st Century

Major products in the manufacturing sector are disk drives, computer parts, communications equipment, electrical appliances, and other electronic and electrical products (Table II.3.6).

Table II.3.6   Manufacturing by Businesses in PDC Region

Sector	No.of Factories	Land Area (ha)	No. Employed	Paid-up Capital (RM million)
Electronics/Electrical	144	286.90	92,230	1,342.69
Textiles/Garments	27	101.14	13,502	319.14
Basic,Metal,Industries	19	69.71	2,416	352.21
Fabricated,Metal,Products	105	95.11	11,088	337.41
Machinery	29	34.84	3,013	96.46
Non-Metallic,Metal,Products	11	21.64	1,035	53.82
Food,Processing/Canning	30	16.60	2,777	41.55
Processing,of,Agricultural,Products	15	24.53	1,062	309.96
Feedmeals	5	7.43	318	12.80
Chemical/Fertilizer	47	70.93	3,626	557.09
Rubber-based	27	37.72	6,611	82.26
Plastic,&,Plastic,Products	64	51.18	8,119	136.91
Wood,&,Wood,Products	16	15.65	967	27.51
Paper&Paper,Products/Printing,Works	47	31.65	4,390	127.13
Professional,Scientific, Measuring & Controlling, Equipment,&,Optical,Goods	6	9.83	4,049	71.38
Transport,Equipment	16	14.87	2,784	93.24
Others	29	14.43	4,716	27.90
TOTAL	637	904.16	162,703	3,989.46

Source: Penang into the 21st Century
Note:1. In PDC Industrial Area
      2. As of December 1993

In response to the rapid movements in Penang State as explained above, the state government has made various efforts. First of all, the state established Malaysia's first Integrated Manufacturing Centre (IMC) for promoting corporate development, financing, R & D, production planning, parts supply, sales, and marketing by multinational companies in Penang State. In 1992, the Small and Medium Industry Centre (SMI-Centre), another first in Malaysia, was established. The SMI-Centre offers start-up support, management advice and training on exports, marketing, and human resources to small and medium scale companies.

Also, the state has been involved in developing human resources at an early stage, and has founded the following organizations:

- Human Resource Development Council (HRDC)
- Skill Development Centre (SDC)

- Plastic Technology Training Centre
- Furniture Technology Training Centre
- Institute of Precision Moulds (IPM)
- Penang International College (PIC)

In the next five years, the following plans are envisioned:
- University Sains Malaysia (ISM) Engineering Faculty
- Polytech (Scheduled to be opened in Butterworth in 1996)
- Tunku Abdul Rhaman (TAR) University annex campus

II.3.2 Future Outlook of the States of Kedah, Penang, and Perak and National Goals

As explained in Vision 2020, the biggest goals of Malaysia is to maintain its economic growth rate at an average of 7%, to usher the country into the ranks of the advanced industrial nations. Moreover, in the NDP and OPP2 under Vision 2020, the Government is placing emphasis on rectifying the social and economic imbalance that exists within regions.

Under the plan by the Federal Government, the major economic indices for the states of Kedah, Penang, and Perak are shown in Table II.3.7. Moreover, no significant change is seen in the respective indices for the entire nation from 1995 to the year 2000. However, in per capita GDP, there is a slight decline because the population growth is higher than the GDP growth in Penang. Even then, however, the GDP growth of the three states is higher than the national average. By contrast, while the GDP of Kedah State and Perak State have increased slightly, they are still about 30% lower than the national average.

By industries, the national growth forecast for the year 2000 is 2.7 times over the year 1990, in line with a nationwide movement toward further promotion of the manufacturing sector. The growth for Kedah State is set at 4.2 times, indicating that the speed of industrialization will be accelerated considerably. As for its share to the nation, the major economic indices will grow remarkably from 19.5% in 1990 to 36.8% in the year 2000. To achieve this goal, Kedah State should have to promote a powerful industrialization program. As for Penang State, the GDP of manufacturing the year 2000 over 1990 is relatively low at 1.9 times. However, the reason for this is because its share in terms of the entire nation in 1990 was

already 46.0%, showing that the state already has a considerable accumulation of industries. Therefore, its share in the year 2000 will only show a slight increase of 46.1% (Table II.3.8).

Table Ⅱ.3.7 Major Economic Indices in the States of Kedah, Penang and Perak

	Kedah			Penang		
	1990	1995	2000	1990	1995	2000
Population	1,367	1,470	1,666	1,159	1,176	1,358
	-	1.5	2.5	-	0.3	2.9
GDP	3,554	5,585	7,697	5,719	8,995	10,312
	-	9.5	6.6	-	9.5	2.8
Per Capita GDP	2,600	3,799	4,620	4,934	7,646	7,595
	-	7.9	4.0	-	9.2	-0.1
	Perak			Malaysia		
	1990	1995	2000	1990	1995	2000
Population	2,098	2,038	2,403	18,010	19,950	22,660
	-	-0.6	3.3	-	2.1	2.6
GDP	7,043	9,860	12,755	79,103	117,265	155,780
	-	7.0	5.3	-	8.2	5.8
Per Capita GDP	3,357	4,838	5,316	4,392	5,875	6,875
	-	7.6	1.9	-	6.0	3.2

source:1990/2000;Second Outline Perspective Plan 1991-2000
   1995;Mid-Term Review of the Sixth Malaysian Plan 1991-1995
Note: The figures in the lower column show the rate to the total of Malaysia.

Table II.3.8 Industry-by-Industry GDP Plans in the States of Kedah, Penang and Perak

	Kedah			Penang		
	1970	1990	2000	1970	1990	2000
Agriculture, forestry	426.3	1,331.0	845.9	155.0	189.4	209.4
and fishing	-	37.0	10.4	19.5	3.3	1.9
Manufacturing	46.5	702.4	2,976.7	101.2	2,667.7	4,996.9
	-	19.5	36.8	12.7	46.0	46.1
Construction	37.0	101.6	243.3	45.9	170.0	253.5
	-	2.8	3.0	5.8	2.9	2.3
Wholease, retail,	41.7	158.0	370.0	212.5	730.9	1,531.2
hotel and restaurant	-	4.4	4.6	26.7	12.6	14.1
Financa, insurance, real estate	56.8	412.6	892.2	77.1	540.4	1,114.8
business and dwelling	-	11.5	11.0	9.7	9.3	10.3
Government services	46.1	534.0	846.2	34.0	562.8	843.2
	-	14.8	10.4	4.3	9.7	7.8
Total	743.3	3,601.3	8,098.7	794.7	5,794.7	10,850.8
	Perak			Malaysia		
	1970	1990	2000	1970	1990	2000
Agriculture, forestry	486.2	1,984.4	2,682.0	3,432.0	14,829	20,820
and fishing	30.4	27.8	20.0	32.1	18.5	12.7
Manufacturing	142.4	1,393.2	3,880.5	1,307.0	21,381	58,010
	8.9	19.5	28.9	12.2	26.7	35.4
Construction	39.8	193.6	346.8	481.0	2,788	5,470
	2.5	2.7	2.6	4.5	3.5	3.3
Wholease, retail,	187.7	754.3	1,683.4	1,423.0	8,700	19,640
hotel and restaurant	11.7	10.6	12.5	13.3	10.9	12.0
Financa, insurance, real estate	114.2	764.6	1,611.0	836.0	7,650	16,490
business and dwelling	7.1	10.7	12.0	7.8	9.5	10.1
Government services	83.0	895.2	1,339.3	794.0	8,459	13,080
	5.2	12.5	10.0	7.4	10.6	8.0
Total	1,598.2	7,136.2	13,442.0	10,708.0	80,151	163,930

In line with the national goals, long-term plans have been formulated on state levels, such as "Kedah Development Action Plan (KDAP): Kedah's Drive Towards Vision 2020 (from 1991 to 2000)" and "Penang Into the 21st Century: Strategic Plan to Build a Fully-Developed, Post Industrial Society" . In KDAP, the plan calls for accelerating the growth of the state economy with the GDP growth targeted at 8.0% per year from 1990 to 2000. This growth rate is slightly higher than the 7.0% growth envisioned for the country's OPP2 plan. Based on this growth rate, the per capita GDP for Kedah State will grow to 67% in 2000 from the 60% of 1990 as compared to the average for the entire country. Also, by 2020, the percentage is expected to improve to 82% to come close to the objectives described in Vision 2020 (Table II.3.9).

Table II.3.9 Major Economic Indices in KDAP State

| | | 1985 (A) | 1990 (B) | 2000 (C) | Average gross rate | |
					(B)/(A)	(C)/(B)
Population	(thousand People)	1215	1345	1615	2.1	1.8
GDP	(RM million)	2541	3567	7700	7.0	8.0
Percapita GDP	(RM)	2092	2653	4768	4.9	6.0
No. of Employees	(thousand People)	413.7	463	698	2.3	4.2

Note:By Policy Package II

In order to achieve the above goals, the KDAP presents projects and developmental strategies in six fields such as industrialization, development of tourism, development of commercial agriculture, eradication of poverty and the Bumiputra Commercial and Industry Community (BCIC). Of these, the following are the development strategies and projects for industrialization.

- Development of industrial land: To develop a minimum of 1,400 hectares of industrial parks (850 hectares by the KSDC. 100 hectares by the Kedah Regional Development Commission and 450 hectares by the private sector).

- Improving Infrastructure: In line with the development of industrial land, the infrastructure for roads, water, electrical power, and communications will be built. Notably, consideration will be given to the maintenance of roads in industrial parks.

- Industrial Waste: Measures will be taken to solve problems concerning industrial waste.

- Human Resources Development: To secure and enhance the level of engineers. Also, to promote the shift of manpower from the agricultural sector to the industrial sector.

- Fostering Small and Medium Scale Enterprises: To strengthen information services and the

service of offering technical advice to small and medium scale enterprises. Also, to foster venture businesses, sub contractors for the Perwaja Steel Mill, light industries, supporting industries, and resource industries.

- Environmental Preservation: To strengthen functions for environmental monitoring stations.

- Promote Integrated Cooperation of Various Organizations. To strengthen cooperation with various organizations at planning and management levels.

- Urban Development: To expand housing and recreation facilities at Alor Setar, Kulim, and Sungai Petani.

On the other hand, in the Penang into the 21st Century plan, the concepts for five objectives are presented, including strategies for building a dynamic and aggressive economic strategy, a strategy to ensure continuous development and a strategy to internationalize regional economies. Of these, some of the main strategies for industrial development are as follows:

- Restructuring Manufacturing Industry: Restructure Manufacturing industry by introducing competitive wage policies that include adding the respective state's unique program to the Federal Government's investment incentives to focus on the industry to high value-adding type, capital equipment type, technology-oriented type, non-pollution type, and energy-saving manufacturing.

- Foster Supporting Industries of Small and Medium scale Enterprises: Offer financial support, joint R & D, improving planning and development facilities, improving technological support systems, building market information network, providing infrastructure, industrial land, offering assistance to supporting industries and establish Small and Medium scale Industries Centres.(SMI Center)

- Environmental Improvement for High Technology: To tie up with University Sains Malaysia to build Penang into an industrial centre for high-tech products.

- To Establish Procurement Methods Within the Region: To create entrepreneurship in the region to enhance procurement ratio within the region.

- Expanding Policies for Encouraging More Investments: To invest about RM 10 billion in the next 10 years to promote investments.

II. 3.3 Qualitative Effect for the Region of KHTP

As explained in Chapter I, the greatest economic and industrial issue in Malaysia is to rectify and enhance the industrial structure. Toward this target, the issues with top priority are to strengthen the foundation and to develop human resource for R & D. Also, as explained in this chapter, the nation's Vision 2020, the NDP, and the OPP2 show the goals and the direction for policies to resolve these problems. In response to these problems, the states of Kedah, Penang, and Perak have formulated specific measures to achieve the goals set by the federal government within its own issues. In these states, important policies for the future will be to promote industrialization strongly. And, the respective states are to implement policies suitable to their respective characteristics.

The KHTP is currently positioned as one of pivotal projects within the KDAP. As explained in the preceding section, this project is an essential project for Kedah State to accomplish its "economic macro frame" for the year 2000. However, the KHTP is not a project only for Kedah State. Within the context of proximity in time-distance, and cooperation of the accumulation of existing industries and mobility of labour force, this project also has intimate relations with the states of Penang and Perak in terms of promoting industrialization of these states.

From a macro-economic perspective, the objective of the KHTP is to accomplish the goal explained above. On the other hand from a micro-economic standpoint, the objectives are 1) to invite high-tech industries to accumulate manufacturing industries in Kedah State, 2) to mutually heighten one's technological level through the industries within the KHTP and through tie-up with industries in the vicinity of the KHTP, and 3) to enhance industrial technology for the entire state.

Expected effects from these new investments in the KHTP are 1) the inducement effect from the investment 2), income effect through growth in corporate production, and 3) other induced effects such as the increase in tax revenue and the increased demand for new homes and purchasing power resulting from an increase in employment. Such a considerable multiplier effect can be anticipated from this project.

Meanwhile, the Kulim Techno Centre (KTC) to be located within the KHTP will have the functions of R & D support, incubation, supporting industries, human resource development, and information services. KTC, with these functions, will exist in the KHTP would become a powerful incentive to attract high-tech industries to the KHTP. Also, should industries within or in the vicinity of the KHTP utilize the KTC's functions, this could make the manufacturing activities of these industries more efficient and sophisticated, which would result in contributing toward the enhancement of the level of industries in the region as a whole. Such a cycle of these economic effects as mentioned above in the mid term will have a ripple effect in a wider area of the region.

The regions to have this ripple effect will be Northern Malaysia. At present, development is relatively slow in Northern Malaysia as well as the east coast of the peninsula. In the NDP or the OPP2, the crucial policy objectives are to rectify this discrepancy between the regions. The development of the Northern Malaysia region is an important issue also to the federal government.

The following is the regional divisions if the economy of Northern Malaysia were to be divided into the northwest region and the northeast region, and the entire peninsula divided into central and southern regions (Figure II.3.4).

Since the states of Perak, Terengganu and Johor extend from east to west, these were partitioned for convenience sake by taking into consideration the concentration of economic entities.
Northern Malaysia, with the northwest and northeast regions combined, has more population than any other region, but in terms of GDP, it is at about the same level as that for the central region. As for GVO (gross value output) and the number of manufacturing companies, it ranks slightly lower than the central region. The number of wholesalers, and retailers in the tertiary industry, quantity of registered automobiles, telephones and other livelihood related indices are lower than in the central region. This trend is notably conspicuous in the northeast region.

Figure II.3.4   Status of Social Economy by Region
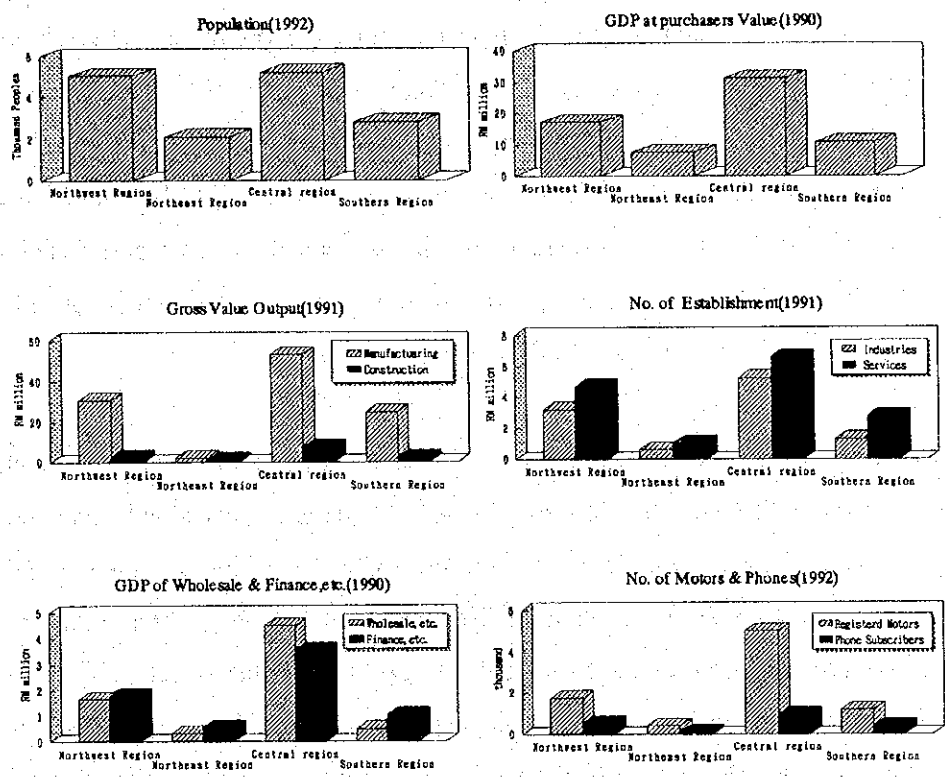
Northwest Region	: the states of Kedah, Perlis, Penang and Perak
Northeast Region	: the states of Kelantan and Terengganu
Central Region	: Federal Territory, the states of Selangor and Pahang
Southern Region	: the states of Malacca and Johor

To correct these gaps between regions, the central government is promoting investments.   In an industrial corridor to strengthen transportation and communication ties between the low-growth states and the industrial hub. The federal government has decided to strategically improve roads, develop infrastructure and improve telecommunication services and so on. It has already been explained that the following two plans have been adopted in the MP6 in addition to the existing Western Corridor (Main Corridor 1).

- East-West Corridor (Main Corridor 2) : Johor Bahru - Kuantan, Terengganu, Kota Bharu

- East-Coast Corridor (Main Corridor 3): Kuantan - Port Klang

To designate this industrial corridor in order to rectify the regional gap is particularly important for the northeast region which lags behind others in terms of development.   In

addition to improving the foundation for development by building more infrastructures in the northeast region, it is necessary to enhance the development potential of the region by promoting more exchanges and tie-ups with industrially advanced region via the corridors. Promoting various exchange programs and tie-ups with economic entities to be accumulated in Penang, which already has a high concentration of industries and excellent port facilities, and the KHTP, which will be expected to have a new accumulation of high tech industries, will contribute greatly to the development of the northeast region.

From the perspective explained above, the states of Kedah and Perak are planning to build new industrial corridors that link the Northeast Region. One is the corridor linking Ipoh with Penang, which is already a growth point in the West-Coast Corridor, and the currently planned corridor that links with Terengganu of the East-Coast Corridor. The other is a corridor that passes through Penang and Kulim and links up to Kota Bharu on the East-Coast Corridor. As for the latter, an expressway has already been completed between Butterworth and Kulim as part of a project related to the KHTP. When this is extended, the economic impact of the KHTP will reach the northeast region to promote economic exchanges between the northwest and northeast regions to mutually enhance the potential for future development. (At present, it takes about six to seven hours to travel by road between the northwest and northeast regions.) (Figure II.3.5)
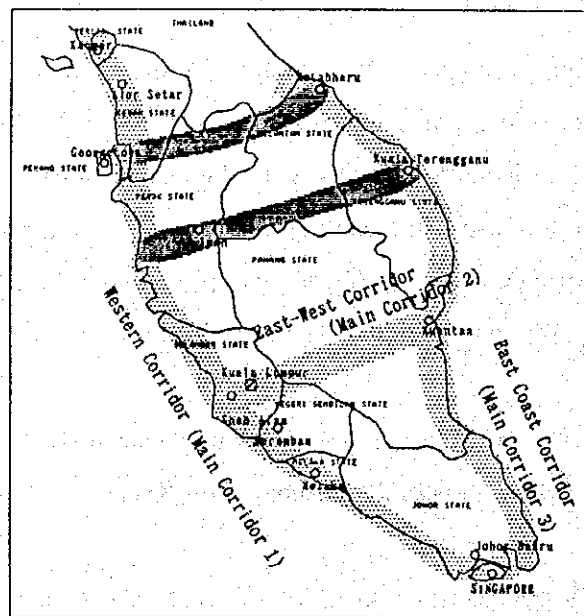

Figure II.3.5 New Strategic Industrial Corridor

The construction and improvement of this East-West Corridor will most likely promote the transfer of labour, invigorate economic activities including the promotion of distribution and logistics, and enhance the developmental potentials of the northeast region. And, as a result, this could promote the economic development of Northern Malaysia and bring about a balanced development throughout the entire nation.

Another region that will impact the economy of the KHTP is the Northern Growth Triangle (IMT-GT: Indonesia-Malaysia-Thailand Growth Triangle). The IMT-GT project attempts to energize the markets of the growth triangle, with Malaysia, Indonesia, and Thailand maintaining close contact to play contributing roles in the promotion of investments and the development of infrastructure, and by encouraging trade and exchanges between private companies that will be invited to locate in the region. The aim is to promote economic activities in tourism, industry, agriculture, transportation, aviation, communication and various services and mobility of labour. The regions covered will be Northern Sumatra (area: 130,000 square kilometers, population: 13.7 million), Northern Malaysia (area: 32,600 square kilometers, population: 5 million) and Southern Thailand (area: 20,000 square kilometers, population: 2.8 million). In total the area covered will be 182,600 square kilometers with a population of 21.8 million (Figure II.3.6).
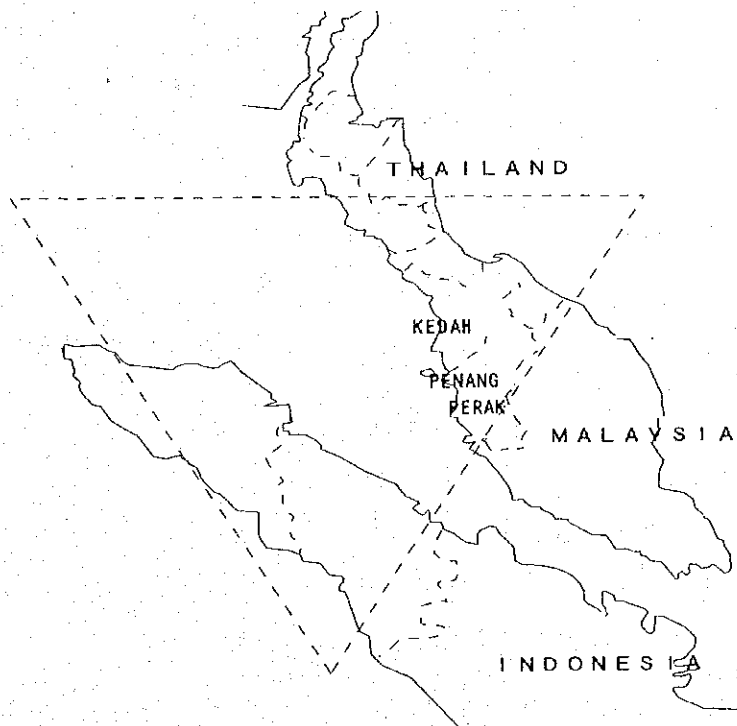

Figure II.3.6   Northern Growth Triangle

In June 1994, a regional international development cooperative organization was established, and the private sectors of the three nations exchanged a memorandum calling for an investment of RM 4 billion. At the Joint Regional Commission comprising members of chief ministers of related states, a decision was made to establish an the IMT-GT Centre and a liaison office in Alor Setar in the state of Kedah.

Of the three nations, Malaysia is the most industrially advanced. Notably in Northern Malaysia, there is an accumulation of industries in Penang State, and further concentration of industries there is anticipated. Also, Kedah State is located along the Thai border. Since the KHTP in Kedah will give birth to new industrial accumulations, these accumulations of industries are expected to play an important role in the IMT-GT.

In 1994, the Asian Development Bank compiled a survey report on the IMT-GT, and indicated that Malaysia should play the following roles to contribute to the project concept on facilities that enable developing skills, carrying out training human resources, operating training centres and promoting tie-ups between corporation and in-house training programs for corporations. These functions are the very functions to be executed by the KTC that is located within the KHTP. In that context, the KTC will be required to act as a primary player.

CHAPTER III
DEMAND FOR TECHNO CENTRE
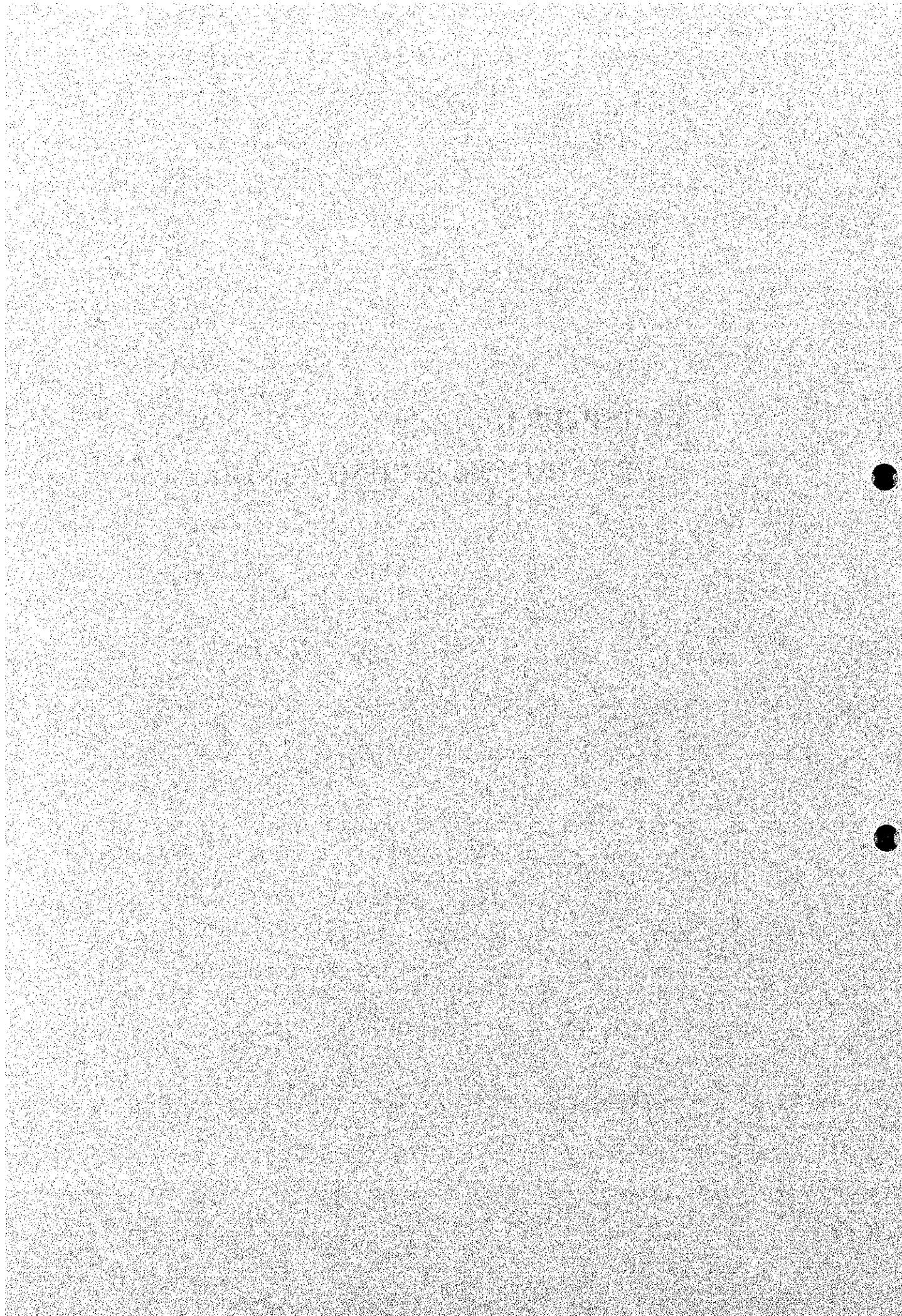
III DEMAND FOR TECHNO CENTRE

III.1 Framework and Method of Needs Analysis

III.1.1 Framework of Needs Analysis

The needs analysis of the Techno Centre consists of three steps as shown in Fig. III.1.1.
At the first stage, the questionnaire survey was conducted with 579 firms in Malaysia to
determine the trends and interests toward KHTP and Techno Centre. Among those
firms that showed some interest, 76 firms were selected to cover the wide range of
industrial classifications to find out the specific needs for the Techno Centre based on
interview survey.
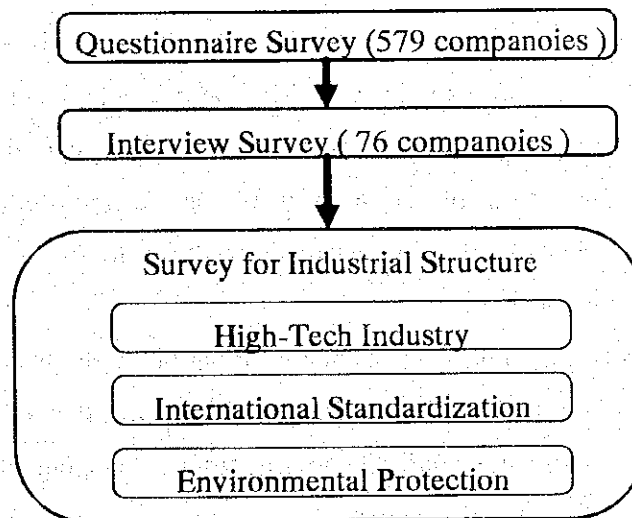
Figure III.1.1   Framework of Needs Analysis

The challenge of our survey lay in the fact that no firm had begun operations yet within
the KHTP at the time of the survey.   Though the clientele of the Techno Centre does
include firms and factories in the surrounding areas, it is not possible to determine the
characteristics of Techno Centre without knowing the type of manufacturing activities
within KHTP which are expected to become the nuclei for the future industry of
Malaysia.

Therefore, as the third step of the needs analysis, an industrial structural survey was conducted to analyze the trends of High-Tech industry development, and target industries to determine the future needs for the Techno Centre.
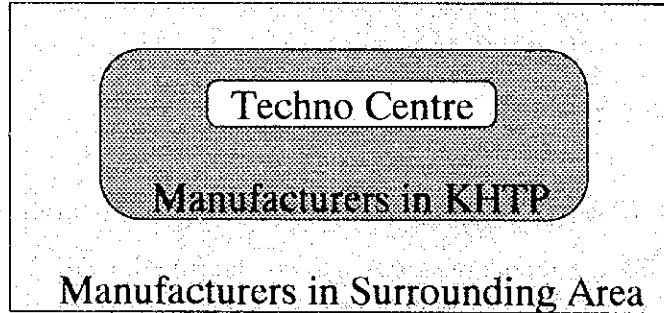

Figure III.1.2 Target Surveyed

The information collected through these surveys will constitute an important database of Techno Centre clientele in the future. In fact a few companies showed strong interest toward KHTP and Techno Centre. On the other hand advanced technologies progresses so rapidly that current technologies often become obsolete within a few years. The Techno Centre needs to keep up with rapid development in technologies to remain useful. In other words, needs surveys have to be continued in the future through the marketing efforts of the services of the Techno Centre. It would be effective to organize clientele to offer systematic feedback to the Techno Centre based on data collected through our surveys.

We need to emphasize the importance as key information of the list of companies and the detailed information on their activities and needs toward the Techno Centre for the operation of Techno Centre and would like to urge future management to make the best use of the information contained in this report.

III.1.2 Methodology of Present Status and Demand Survey

(1) Objectives

The present status and demand on R & D and Human Resources Development (HRD) activities have been surveyed and evaluated via mail questionnaire survey and interview survey for purposes of clarifying needs for the Techno Centre to contribute to the planning of Techno Centre.

The main objectives of the present situation and demand survey are summarized as follows:

- To grasp current and planned activities of R & D and HRD

- To grasp the number of enterprises interested in Techno Centre

- To study the prerequisites on provided services/functions and facilities which users shall call for in the Techno Centre

- To study the industrial categories of interested enterprises.

The main objectives of the interview survey are summarized as follows:

- To examine in depth the possibility of utilizing the Techno Centre

- To examine in depth the present status and needs for R & D and HRD activities

- To examine in depth the needs (expected functions, facilities, and equipment) for the Techno Centre.

(2) Methodology of surveys

The work flow of the surveys is illustrated in Figure III.1.3.

```
┌─────────────────────────────────────────────────────────┐
│         Compilation of Enterprise Inventory             │
└─────────────────────────────────────────────────────────┘
                         │    ┌──────────────────────────┐
                         │◄───│ Selection of Concerned Industrial │
                         │    │ Categories and Regions   │
                         ▼    └──────────────────────────┘
┌─────────────────────────────────────────────────────────┐
│              Selection of Survey Samples                │
└─────────────────────────────────────────────────────────┘
                         ▼
┌─────────────────────────────────────────────────────────┐
│               Mail Questionnaire Survey                 │
└─────────────────────────────────────────────────────────┘
                         ▼
┌─────────────────────────────────────────────────────────┐
│        Interview Survey for Interested Enterprises      │
└─────────────────────────────────────────────────────────┘
                         ▼
┌─────────────────────────────────────────────────────────┐
│        Evaluation of Needs for the Techno Centre        │
└─────────────────────────────────────────────────────────┘
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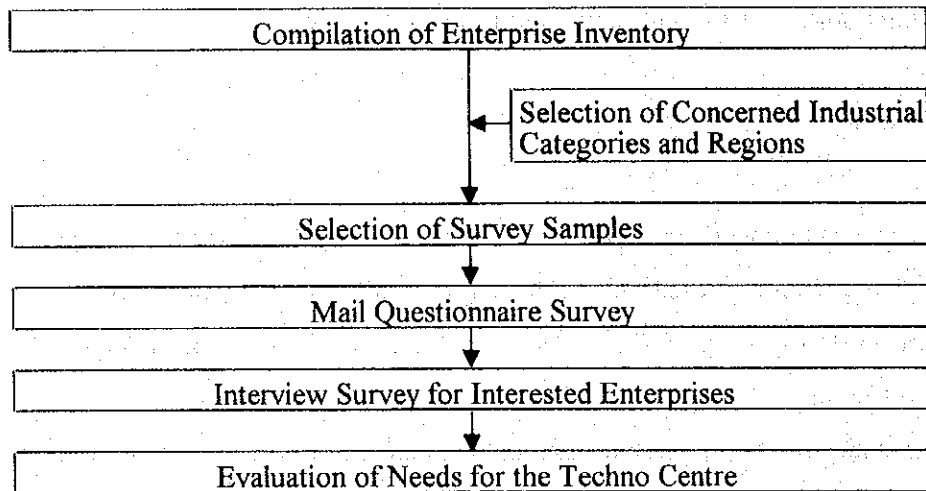
Figure III.1.3   Work Flow of the Survey on Present Status and Demand

The mail questionnaire survey and interview survey for interested enterprises have been conducted by a local consultant through mailings and interviews respectively.

In regard to the mail questionnaire survey, the collection has been conducted by means of direct interviews in order to obtain high response to the mailings collection.

The interview survey has been conducted by a JICA Study Team in collaboration with the local consultant which implemented the mail questionnaire survey.

(3) Targeted companies to be surveyed

The mail questionnaire survey has been carried out on the following potential users /enterprises:

- Malaysian enterprises located in Kedah, Penang, Selangor and Perak States, and KL.
- Foreign enterprises including Japanese enterprises located in Kedah, Penang, Selangor and Perak States, and KL.
- Enterprises which plan to enter the Industrial Zone-Phase I of KHTP

The interview survey has been carried out on the following potential users /enterprises:

- Enterprises which marked "Yes" and "Possibly" to the question about interest in utilizing facilities and services provided by the Techno Centre

Target enterprises for the above surveys are described hereafter in detail.

III.2 Questionnaire Survey Results

III.2.1 Preparation of the Questionnaire Survey

(1) Design of the questionnaire

The Study Team finalized the form of questionnaires in March 1995, to be used for the survey, together with a pamphlet to introduce the profile of the Techno Centre. The following items included to measure the scope of problems on management and operation as well as a possibility to use facilities/functions to be provided by the Techno Centre.

- Types of manufactured products
- Sales amount (value)
- Marketing (export)
- Problems on management and operation
- Future prospects for business expansion
- Current R & D activities
- Future prospects of R & D activities
- Current activities for human resource development
- Future prospects of human resource development activities
- A possibility of investment in KHTP
- A possibility of utilization of facilities in the Techno Centre

(2) Selection of target enterprises

The first group of target enterprises consists of those located in and around the Kulim area. The second group consists of those which plan investment in the Industrial Zone - Phase I of the KHTP. The third group consists of existing foreign and local companies located in Kedah, Penang, Selangor and Perak States, and KL.

579 enterprises in total were selected by the following sampling method.

(a) Specific Sampling

281 enterprises were selected, sampling from the following inventories:

- Enterprises located in industrial estates in Kedah State---65 firms selected from among the enterprises related to high-tech industries (chemicals, metal industries, electric/electronic, machinery, transport equipment, etc.)

- Enterprises listed by the JICA Prestudy Team---216 Foreign & J/V firms

(b) Random Sampling

The remaining 298 local enterprises related to high-tech industries (chemicals, metal industries, electric /electronic, machinery, transport equipment ,etc.) located in Kedah, Penang, Selangor and Perak States, and KL were selected by random sampling method from the following inventories:

- Federation of Malaysia Manufacturers 1994---226 firms
- Company list owned by MIDA---72 firms

III.2.2 Results of Questionnaire Survey

(1) Response rate

The results, in terms of response rate, of the questionnaire survey for the Techno Centre in KHTP are shown in Table III.2.1. The number of enterprises which replied to the questionnaire, amounted to 220, which corresponds to 38% of the total number of 579 enterprises.

Table III.2.1   Replied Numbers of Questionnaire Survey

Nos. of Samples	Replied Nos.	
	Number	%
579	220	38

(2) Current problems on management and operation

More than 50% of 211 responding enterprises point out a lack of skilled workers and lack of unskilled workers as current problems on management and operation regardless of ownership (Refer to Figure III.2.1). The results indicate that lack of workers is the most serious problem in Malaysia.
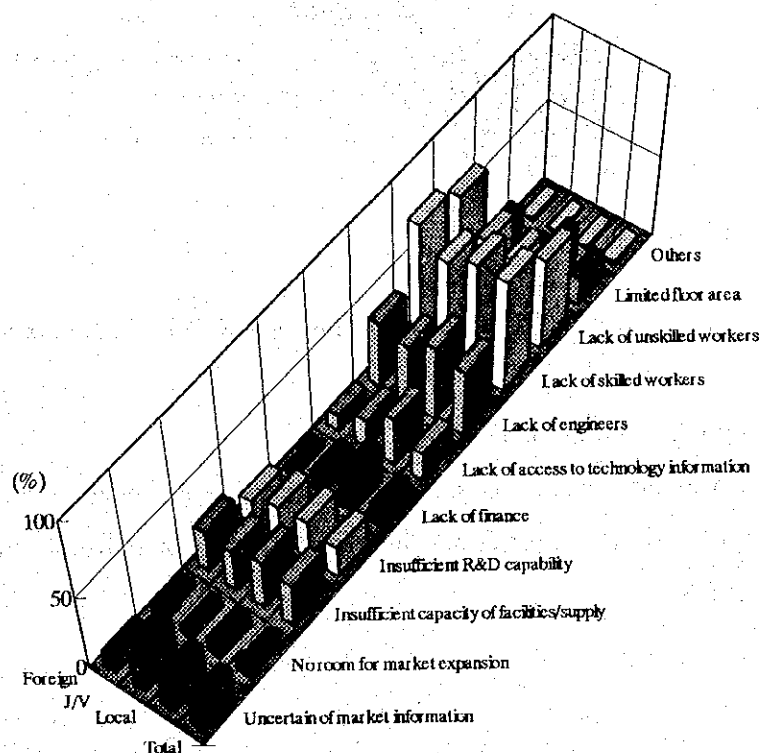

Figure III.2.1   Current Problems on Management and Operations

(3) Present Status and Demand on R & D

(a) Current problems on R & D by manufacturing type

More than 50% of 132 responding enterprises point out the lack of access to expertise (59%) and lack of access to research facilities (50%) for current problems on R & D regardless of manufacturing type (Refer to Figure III.2.2).
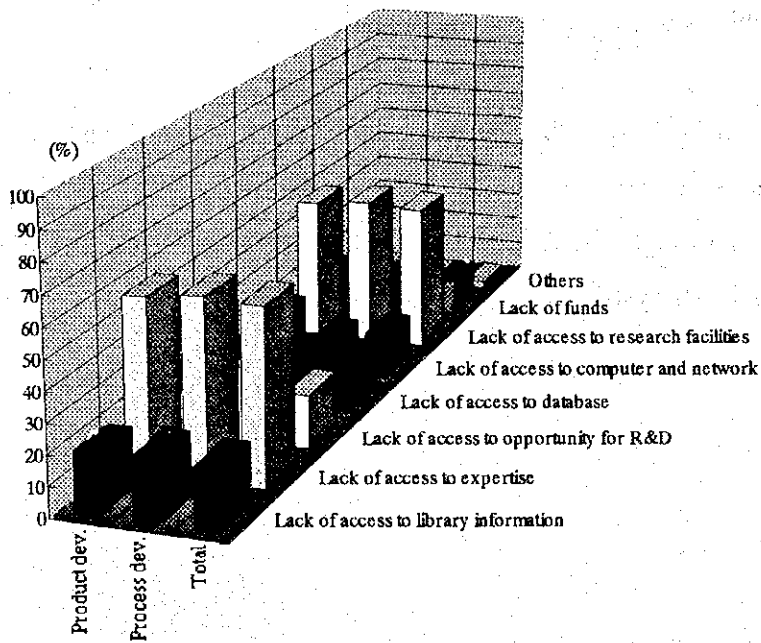
Figure III.2.2   Current Problems on R & D by Manufacturing Type

(b) Expansion plan on R & D in the future

Out of 220 responding enterprises, nearly 60% replied positively on expansion plan on R & D in the future. Local enterprises are slightly more aggressive than foreign enterprises (Refer to Figure III.2.3).
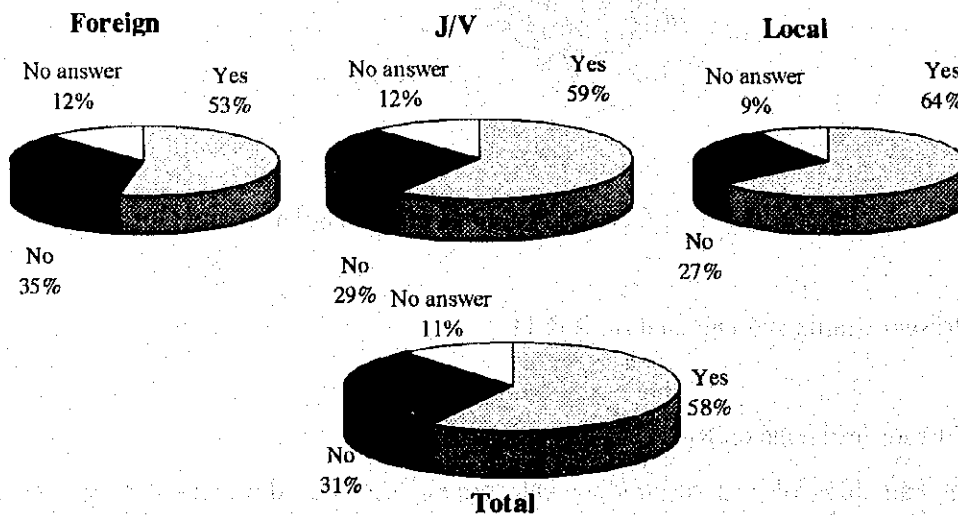

Figure III.2.3   Expansion Plan on R & D

(c) Fields of R & D in the future

Among the fields of R & D in the future, electronics is a predominant target, followed by new materials and mechatronics (Refer to Figure III.2.4).

Net number of responding enterprises: 120
N.B. Plural answer
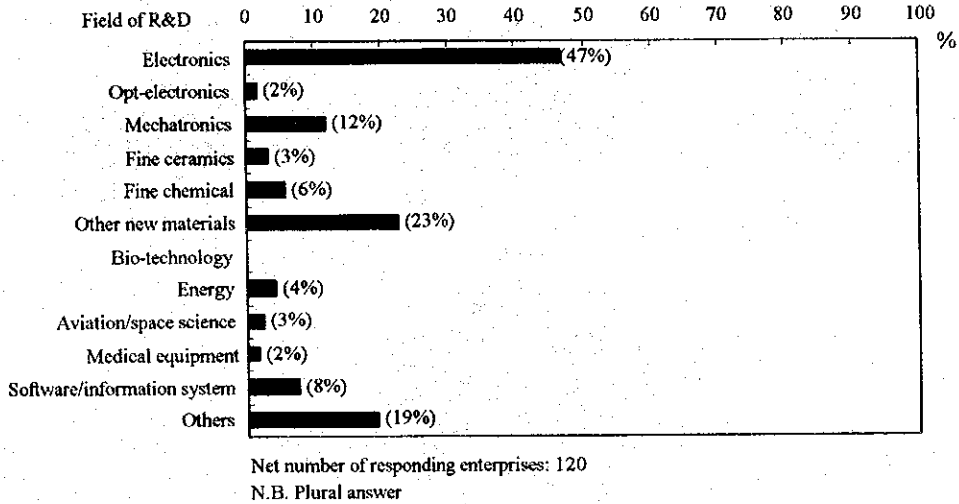
Figure III.2.4   Fields of R & D in the Future

(4) Present Status and Demand on Human Resources Development (HRD)

(a) Current problems on HRD

68% of 185 responding enterprises points out a lack of time for training and education, and 56% indicated a loss of investment due to job-hopping problems on HRD (Refer to Figure III.2.5).

Net number of responding enterprises: 185
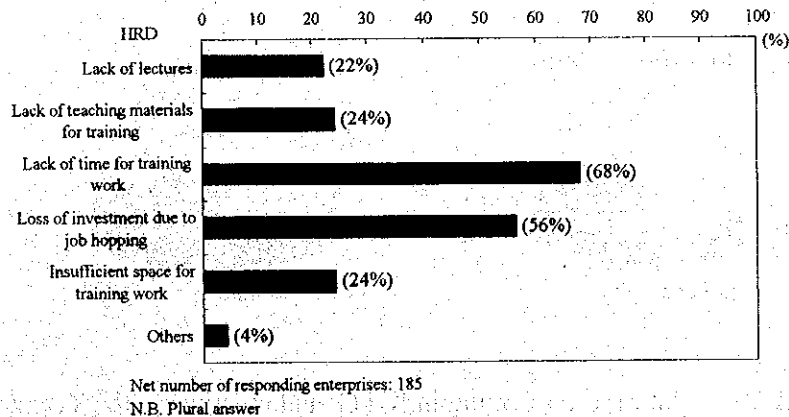N.B. Plural answer

Figure III.2.5   Current Problems on Human Resources Development

(b) Expansion plan on HRD in the future

Out of 220 responding enterprises, nearly 90% replied positively toward expanding plan on HRD in the future regardless of ownership (Refer to Figure III.2.6).
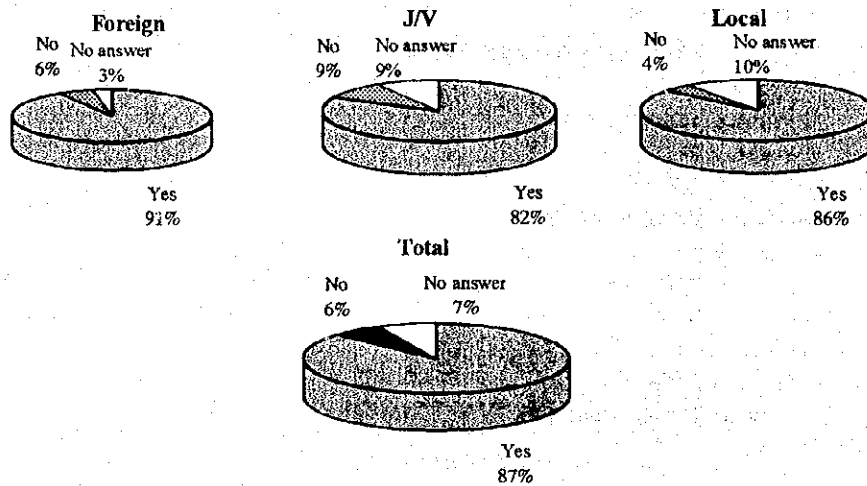
Figure III.2.6   Expansion Plan on Human Resource Development

(5) Interest in locating in KHTP and utilizing the Techno Centre

The results of the questionnaire survey concerning the Techno Centre in KHTP are summarized as shown in Figure III.2.7. The detailed results are shown in Table III.2.2. Out of 220 enterprises, 94 enterprises showed interest in locating new factories in KHTP. Out of 94 enterprises, 12 enterprises marked "Yes" and 82 enterprises marked "Possibly". With regard to the utilization of the Techno Centre, 143 enterprises (65%) showed an interest. Out of 143 enterprises, 36 enterprises marked "Yes" and 107 enterprises marked "Possibly".
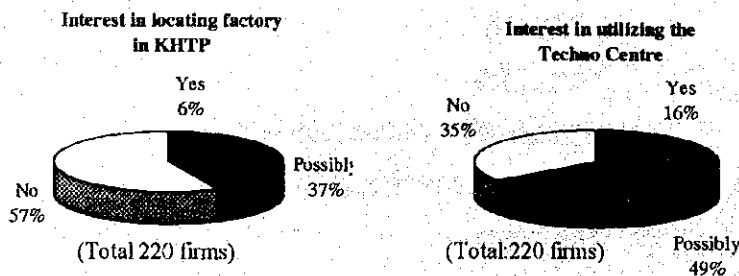
Figure III.2.7   Interest in Locating in KHTP and in Utilizing the Techno Centre

(6) Expected services and facilities for the Techno Centre by questionnaire survey

(a) Expected services for the Techno Centre

The expected services available in the Techno Centre are shown in Figure III.2.8. The enterprises interested in utilizing the Techno Centre wish to receive seminars & training, information, testing, consulting, and measurement services among all the services.

Net number of responding enterprises: 143
N.B. Plural answer
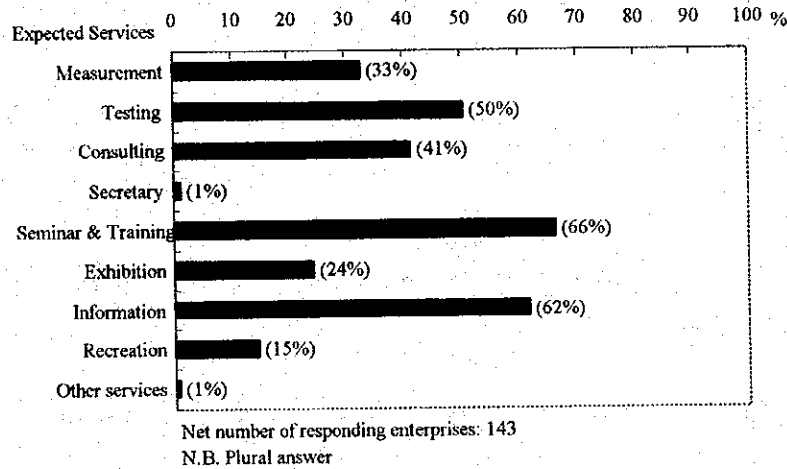
Figure III.2.8   Expected Services of the Techno Centre

(b) Expected facilities for the Techno Centre

Expected facilities for the Techno Centre are shown in Figure III.2.9.   The enterprises are more interested in using an information centre, open laboratories, and rental facilities in the Techno Centre.

Net number of responding enterprises: 125
N.B. Plural answer

Figure III.2.9   Expected Facilities in Utilizing the Techno Centre

Table III.2.2 Interest in KHTP and Techno Centre
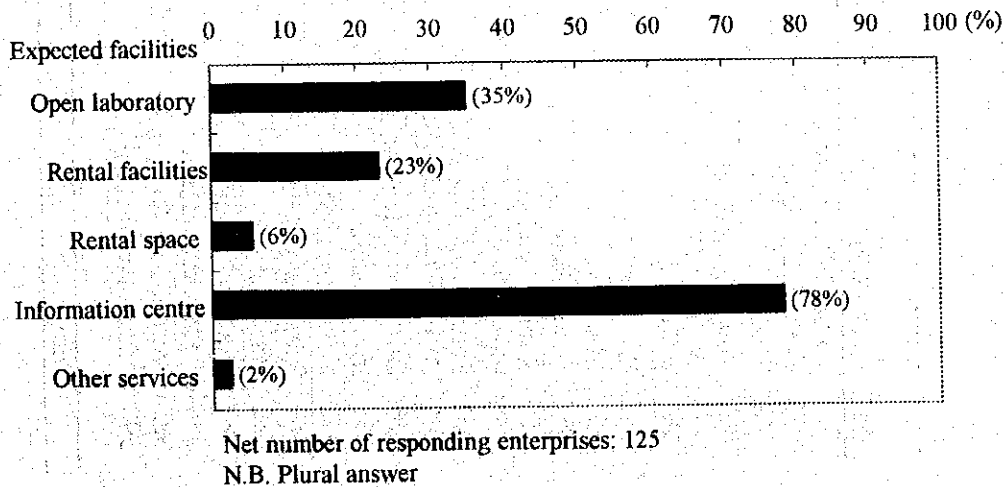
ISIC	CLASSIFICATION	Nos. of Sample	Replied Nos.	Nos. of Effective	Interest in KHTP			Interest in Techno Centre		
					Yes	Possibly	Total	Yes	Possibly	Total
311	Food Manufacturing	7	4	4	0	1	1	1	1	2
313	Beverage Industries	6	2	2	0	1	1	1	0	1
321	Textiles	11	6	6	1	3	4	1	4	5
322	Wearing Apparel	5	1	1	0	1	1	0	0	0
331	Wood & Cork	6	1	1	0	0	0	0	0	0
332	Furniture	2	1	1	0	1	1	0	1	1
342	Printing	1	1	1	1	0	1	1	0	1
351	Chemical	12	6	6	1	4	5	1	4	5
352	Other Chemical	55	20	20	0	4	4	2	12	14
355	Rubber Products	28	13	13	1	7	8	2	6	8
356	Plastic Products	35	15	15	3	3	6	4	5	9
361	Pottery & China Ware	5	4	4	0	2	2	1	2	3
362	Glass & Glass Products	6	2	2	0	0	0	0	0	0
369	Other Non Metal Mineral	6	2	2	1	1	2	1	1	2
371	Iron & Steel	18	5	5	0	2	2	0	3	3
372	Non Ferrous Metal	7	6	6	0	4	4	2	2	4
381	Fabricated Metal	39	17	17	0	9	9	3	9	12
382	Machinery	48	14	14	0	7	7	2	8	10
383	Electrical Machinery	191	72	72	2	25	27	8	37	45
384	Transport Equipment	20	3	3	1	0	1	2	1	3
385	Professional Equipment	28	14	14	0	3	3	2	5	7
390	Other Manufacturing	43	11	11	1	4	5	2	6	8
	Total	579	220	220	12	82	94	36	107	143

III.3 Results of the Cross Section Interview Survey

III.3.1 Preparation of the Interview Survey

(1) Design of the interview form

The Study Team finalized the form of interviews in June 1995. According to the results of questionnaire survey, the expected services for the Techno Centre were testing/measurement, seminar & training, and information services. The detailed contents of their services, the present status on R & D, HRD and information system and a possibility of utilization for the Techno Centre were further investigated through the interview survey.

In consequence, the following items were included to measure the present status on R & D, HRD, and information system and needs for each service of the Techno Centre as well as a possibility to utilize facilities/equipment to be provided by the Techno Centre.

- Current production activities
- Current and planned R & D activities including testing and measurement
- Current and planned HRD activities
- Current situation and planned utilization of information system
- A possibility of investment in Kulim High-Tech Industrial Park
- A possibility of utilization of facilities/equipment to be provided by the Techno Centre

(2) Selection of enterprises for the interview survey

143 enterprises which marked "Yes" and "Possibly" to the question about interest in utilizing facilities provided in the Techno Centre, were selected as a target group of the interview survey in the initial stage. Out of 143 enterprises, 67 enterprises refused the survey due to the following reasons:

- The representative had gone abroad or to another place.
- The representative would be very busy during the second field survey period.
- The firms did not want to cooperate with the survey any longer.

- The firms were not interested in utilizing the Techno Centre after reconsideration.
In the end, 76 enterprises were set for the interview survey.

III.3.2 Results of the Interview Survey

Out of 76 enterprises, 71 enterprises replied the interview survey. The results of the interview survey are described hereinafter.

(1) Present status on R & D, HRD and information system

The present status on R & D activities is summarized below.
- A majority of foreign enterprises is currently conducting basic R & D activities in their parent enterprises. The improvement of production process is conducted locally. A part of foreign enterprises has a plan to transfer a part of R & D functions from their parent enterprises.
- A majority of local enterprises are not conducting R & D activities. There were 2 local enterprises conducting R & D.
- Testing and calibration services have been conducted in SIRIM, SISIR, and other private institutions. Some enterprises point out that they have problems such as taking long time for their services and limited capacity of their services.
- Most product performance, durability, and failure analyses are conducted in-house.
- Simple measurement and mechanical testing are conducted in-house.

The present status on HRD activities is summarized below.
- A majority of foreign enterprises sends manager class to their parent enterprises for training management capability for a few months.
- Many enterprises are supporting their workers who attend various seminars held in KISMEC (Kedah Industrial Skills and Management Development Centre), FMM, USM, NPC (National Productive Centre), NIOSH (National Institute of Occupational Safety & Health), etc.
- Some large enterprises conduct training for workers based on original manuals.
- Small and Medium local enterprises are carrying out training mainly through OJT

for skilled and unskilled workers.

- All enterprises surveyed point out that they cannot retain technologies due to job-
hopping of skilled workers. Many enterprises adopt countermeasures such as
increasing salaries and improvement of labor conditions.

The present status on information systems is summarized below.

- The computer system is introduced in electric/electronic enterprises for the
purpose of sales promotion and market research activities.

- The information system of data base / library and the internet have not been
utilized in most enterprises. Some enterprises have a plan to introduce the system
in the near future.

(2) A possibility of utilization of the Techno Centre

The results of the interview survey for the Techno Centre in KHTP are summarized as
shown in Figure III.3.1. Out of 76 enterprises, 16 enterprises showed strong interest in
locating new factories in KHTP. With regard to the utilization of the Techno Centre, 64
enterprises (84% of target enterprises) showed strong interest.

Interest in locating factory
in KHTP

N/A 7%   Very Positive 21%   Unfavorable 9%

Interest in utilizing
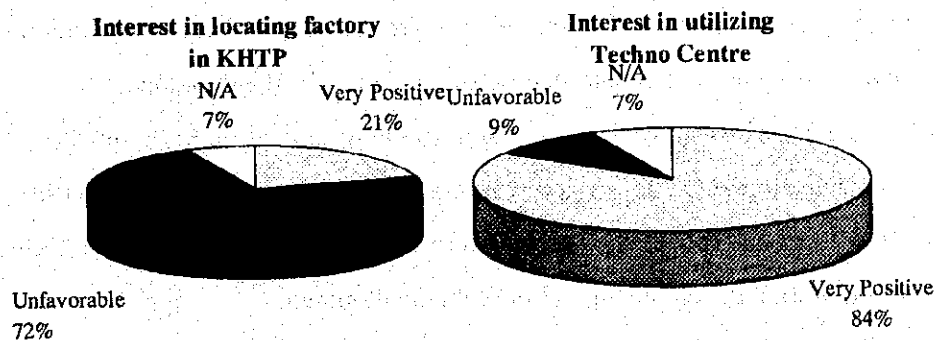**Techno Centre**
N/A 7%

Unfavorable 72%

Very Positive 84%

Figure III.3.1   Interest in Locating in KHTP and in Utilizing
the Techno Centre by Interview Survey

(3) Expected services and facilities/equipment for the Techno Centre by interview survey

(a) Expected services and facilities/equipment on R & D including testing/measurement

A majority of enterprises showed more interest toward the following various testing & calibration / measurement services.

  - structural analysis and microscopic observation

  - material analysis and element identification

  - environmental impact test of products

  - load test of products

  - dimension, shape, and surface measurement of products

  - measurement of electric/electronic characteristics

  - prototype production

  - test for inferior goods

  - durability test of products

  - performance test of materials, products, and equipment for production, etc.

The enterprises request a wide range of facilities and equipment for various testing & calibration /measurement services. Those facilities and equipment are showed in Table III.3.1.

(b) Expected services on HRD including seminars & training

  - Many enterprises showed an interest toward training services on operation know-how of machines and repair method of machines for their engineers.

  - Some enterprises showed an interest in training services on know-how of management and QC for skilled workers such as managers and supervisors.

  - A few local enterprises showed an interest toward training services on technology of production development and process development.

(c) Expected services on information

  - Some enterprises showed an interest toward information services on procurement method of equipment and parts

  - Some enterprises desired information services on the latest standard for materials and parts and the latest journals of technology.

  - A few enterprises wished information services on subcontractors and vendors.

Table III.3.1 Expected Equipment for Techno Centre by Interview Survey

Name of Expected Equipment	Nos. of Enterprises	Name of Expected Equipment	Nos. of Enterprises
Material Analysis		**Mechanical**	
Gas chromatograph	5	Universal Testing Machine	13
Gas chromatograph mass spectrometer	2	Impact testing machine	9
Liquid chromatograph	4	Torque testing machine	5
Ion chromatograph	0	Hardness tester	11
Amino acid analyser	1	Micro hardness tester	8
Ion meter	0	Surface roughness tester	7
Fourier transform infrared spectro-photometer	2	Profile meter	12
UV-Visible spectrometer	3	Water purification system	0
Fluorescence X ray analyser	0	Magnetic surface scanner	3
Atomic Absorption Spectrophotometer	4	Ultrasonic Detector	3
Frameless Atomic Absorbtion Spectrophtometer	0	3 - dimension modelling	2
Fluorescent X ray analyser	2	3 - dimension coordinate measure	2
X-ray diffraction analyser	3	Stress/strain meter	1
Automatic carbon sulfer cloride nitrogen analyser	0	NC machine	2
ICP	0	Surface grinder	1
ICPM	0	CNC lathe	2
Dissolved oxgen meter	2	**Electronic Analysis**	
TOD meter	0	Frequency counter	1
TOC meter	0	Inductance meter	1
Electric conductivity meter	12	Oscilloscope	1
pH, ORP meter	2	Logic analyser	1
Viscocity meter	2	FFN analyser	1
Heat Balance	3	**Bio-Engineering**	
Heat weitht analyser	0	Cell crusher	0
Chemical balance	2	Autoclave	0
Scanning electron microscope	0	Super-centrifuge	0
Density Analyser	2	Incubator	0
Laser particle size analyser	0	Occilating incubator	0
Colour codes	2	Super-low temperature chamber	0
Durability Test			
Weather meter	0	No. of answered enterprises	64
Constant temperature and humidity chamber	2	N.B. Prural answer	
Salt water showering test chamber	1		
Electro-magnetic sealed room	3		
Radiowave shield room	1		
Vibration shaker	4		
Drop/shock test	4		
Acoustic calibrator	1		

(d) Expected other services related pollution control

- Some enterprises showed an interest toward monitoring services on the quality of industrial waste water.

- Some enterprises showed an interest toward R & D services on the treatment of solid waste.

III.4 Evaluation of Needs for the Techno Centre

III.4.1 Evaluation of Needs on Functions and Services to be provided by Techno Centre

The needs on functions and services to be provided by the Techno Centre are summarized below, judging from the results of mail questionnaire survey and interview survey.
- R & D including various testing, measurement, and calibration services
- HRD including seminar & training services on operation know-how of machines and repair method of machines, know-how of management and QC for skilled workers, and technology of production development and process development
- Information services on procurement method of equipment and parts, latest standard for materials and parts, latest journals for technology, and subcontractors and vendors
- Other services related pollution control such as monitoring services on the quality of industrial waste water and the treatment of solid waste

III.4.2 Evaluation of Needs on Facilities/Equipment to be provided by Techno Centre

In order to confirm suitable facilities/equipment, reconfirmed questionnaire survey on the needs for them by means of facsimile was conducted for 100 enterprises with high probability of utilization of the Techno Centre after the interview survey during the second field survey period. Out of 100 enterprises, 26 firms replied. The results of the questionnaire survey are shown in Figure III.4.1.

The major needs on facilities/equipment to be provided by the Techno Centre are summarized below, on the basis of the results of the mail questionnaire survey and the interview survey as well as reconfirmed questionnaire survey.

- Gas chromatography
- Electric conductivity meter
- Universal material testing machine
- Torque testing machine
- Micro hardness tester
- Laser surface measuring instrument
- Profile meter
- X-ray microanalyser

- Scanning electron microscope
- Constant temperature/ humidity chamber
- Thermal impact durability testing machine
- LCR meter
- Spectrum analyzer, etc.

III.4.3 Evaluation of Overall user Demand

As the result of screening by means of interview survey, enterprises with high probability of utilization of the Techno Centre are narrowed down as shown in Table III.4.1.

Table III.4.1   Nos. of Enterprises with High Probability of Utilization of the Techno Centre

	Nos. of Prospective Enterprises in Questionnaire Survey	Nos. of Enterprises with High Probability of Utilization
Screening Result	143	64

On the basis of the expansion coefficient, which is equivalent to the reciprocal of the sampling ratio, in each category of industry as shown in Table III.4.2, user's demand for the Techno Centre has been estimated as shown in Table III.4.3.   As seen in the table, the total number of highly prospective enterprises is projected as 240 firms at present.   Taking into consideration that the Techno Center is responsible for the promotion to invest in KHTP, the demand for the Techno Centre can be presumed to increase in the future.

Considering the circumstances mentioned above, overall investment demand can be concluded at more than 240 firms.   The estimated demand for utilization is judged to be sufficient for the development of the Techno Centre in KHTP.
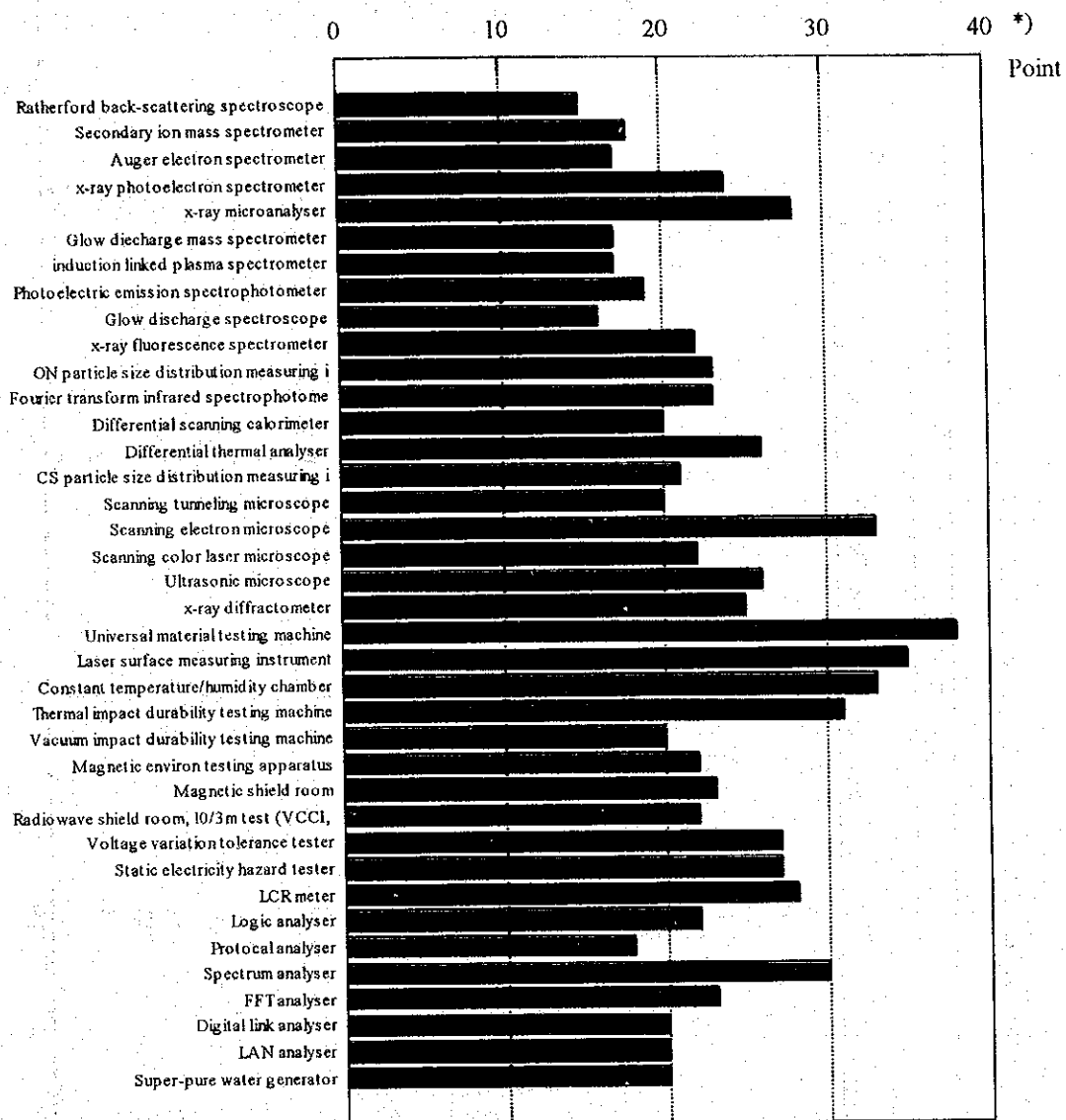
Figure III.4.1   Results of Confirmed Questionnaire Survey

Table III.4.2 Expansion Coefficient to Estimate by Industries

Category	(a) Population for Random Sampling	Nos. of Samples		(b) Random Sampling	(c)=(b)/(a) Sampling Ratio	1/(c) Expansion Coefficient
		Total	Specific Sampling			
311 Food manufacturing	104	7	3	4	0.038	26
313 Beverage industries	72	6	1	5	0.069	14
321 Textile	69	11	8	3	0.043	23
322 Wearing apparel	68	5	3	2	0.029	34
331 Wood / cork	79	6	5	1	0.013	79
332 Furniture	66	2	1	1	0.015	66
342 Printing	95	1	1	0	0.000	-
351 Chemicals	43	12	5	7	0.163	6
352 Other chemical	56	55	23	32	0.571	2
355 Rubber products	107	28	13	15	0.140	7
356 Plastic products	97	35	13	22	0.227	4
361 Pottery, china ware	0	5	5	0	-	-
362 Glass / glass products	6	6	5	1	0.167	6
369 Other non-metal mineral	74	6	5	1	0.014	74
371 Iron / steel	32	18	8	10	0.313	3
372 Non-ferrous metal	23	7	4	3	0.130	8
381 Fabricated metal	170	39	21	18	0.106	9
382 Machinery	80	48	12	36	0.450	2
383 Electrical machinery	206	191	100	91	0.442	2
384 Transport equipment	71	20	13	7	0.099	10
385 Professional equipment	13	28	19	9	0.692	1
390 Other manufacturing	34	43	13	30	0.882	1
Total	1565	579	281	298		

Table III.4.3 Estimate of Overall User's Demand for the Techno Centre

No. ISIC	Classification	Sampling Specific	Sampling Random	Expansion Coefficient 1/	Estimation of User's Demand 1/
1 313	Beverage	O		1	1
2 321	Textile	O		1	1
3 321	Textile	O		1	1
4 342	Printing	O		1	1
5 351	Chemical	O		1	1
6 351	Chemical		O	6	6
7 352	Other chemical	O		1	1
8 352	Other chemical	O		1	1
9 352	Other chemical	O		1	1
10 352	Other chemical	O		1	1
11 352	Other chemical	O		1	1
12 352	Other chemical		O	2	2
13 352	Other chemical		O	2	2
14 355	Rubber products	O		1	1
15 355	Rubber products		O	7	7
16 356	Plastic Products		O	7	7
17 356	Plastic Products		O	4	4
18 356	Plastic Products		O	4	4
19 361	Pottery&China Ware	O		1	1
20 361	Pottery&China Ware	O		1	1
21 361	Pottery&China Ware	O		1	1
22 369	Other non metal mineral		O	74	74
23 371	Iron&Steel	O		1	1
24 371	Iron&Steel		O	3	3
25 372	Non ferrous metal		O	8	8
26 372	Non ferrous metal		O	8	8
27 372	Non ferrous metal		O	8	8
28 381	Fabricated metal	O		1	1
29 381	Fabricated metal	O		1	1
30 381	Fabricated metal		O	9	9
31 381	Fabricated metal		O	9	9
32 381	Fabricated metal		O	9	9
33 381	Fabricated metal		O	9	9
34 382	Machinery		O	2	2
35 382	Machinery		O	2	2
36 382	Machinery		O	2	2
37 382	Machinery		O	2	2
38 382	Machinery		O	2	2
39 383	Electrical machinery	O		1	1
40 383	Electrical machinery	O		1	1
41 383	Electrical machinery	O		1	1
42 383	Electrical machinery	O		1	1
43 383	Electrical machinery	O		1	1
44 383	Electrical machinery	O		1	1
45 383	Electrical machinery		O	2	2
46 383	Electrical machinery		O	2	2
47 383	Electrical machinery		O	2	2
48 383	Electrical machinery		O	2	2
49 383	Electrical machinery		O	2	2
50 383	Electrical machinery		O	2	2
51 383	Electrical machinery		O	2	2
52 383	Electrical machinery		O	2	2
53 383	Electrical machinery		O	2	2
54 383	Electrical machinery		O	2	2
55 384	Transport equipment	O		1	1
56 384	Transport equipment		O	10	10
57 385	Professional equipment	O		1	1
58 385	Professional equipment	O		1	1
59 385	Professional equipment		O	1	1
60 385	Professional equipment	O		1	1
61 390	Other manufacturing	O		1	1
62 390	Other manufacturing	O		1	1
63 390	Other manufacturing		O	1	1
64 390	Other manufacturing		O	1	1
	TOTAL				240

1/ Refer to Table III.4.2.