

ASIAN DEVELOPMENT BANK

RRP: MAL 29331

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
AND
TECHNICAL ASSISTANCE GRANT
TO
MALAYSIA
FOR THE
TECHNICAL EDUCATION PROJECT**

November 1997

CURRENCY EQUIVALENTS

(as of 18 November 1997)

Currency Unit	—	Ringgit (RM)
RM1.00	=	\$0.3002
\$1.00	=	RM3.3315

For the purpose of calculations in this Report, the rate of \$1.00=RM2.85 has been used. This was the rate prevailing at the time of loan appraisal.

ABBREVIATIONS

7MP	-	Seventh Malaysia Plan (1996-2000)
BME	-	Benefit Monitoring and Evaluation
DPSD	-	Development, Privatisation and Supply Division
EMIS	-	Educational Management Information System
EPRD	-	Educational Planning and Research Division
EPU	-	Economic Planning Unit
HRD	-	Human Resource Development
HRDF	-	Human Resources Development Fund
IT	-	Information Technology
MARA	-	Majlis Amanah Rakyat (Council for Advancement of Indigenous Peoples)
MCE	-	Malaysian Certificate of Education
MCE (V)	-	Malaysian Certificate of Education - Vocational
MOE	-	Ministry of Education
MOHR	-	Ministry of Human Resources
MOYS	-	Ministry of Youth and Sports
NVTC	-	National Vocational Training Council
O&M	-	Operation and Maintenance
PIU	-	Project Implementation Unit
PWD	-	Public Works Department
R&D	-	Research and Development
STS	-	Secondary Technical School
SVS	-	Secondary Vocational School
TA	-	Technical Assistance
TED	-	Technical Education Department
TEST	-	Technical Education and Skill Training
TTTC	-	Technical Teachers Training College
TVE	-	Technical and Vocational Education
TVEP	-	Technical and Vocational Education Project

NOTES

- (i) The fiscal year of Malaysia ends on 31 December.
- (ii) The academic year is from December to October the following year.
- (iii) In this Report, "\$" refers to US dollars.

CONTENTS

	Page
LOAN AND PROJECT SUMMARY	ii
MAP	vi
I. THE PROPOSAL	1
II. INTRODUCTION	1
III. BACKGROUND	2
A. Subsector Framework	2
B. Government Policies and Plans	6
C. External Assistance to the Sector	10
D. Lessons Learned	11
E. The Bank's Sector Strategy	12
F. Policy Dialogue	12
IV. THE PROPOSED PROJECT	13
A. Rationale	13
B. Objectives and Scope	14
C. Cost Estimates	16
D. Financing Plan	17
E. Implementation Arrangements	17
F. Environmental and Social Measures	21
G. Technical Assistance	22
V. PROJECT JUSTIFICATION	23
A. Financial and Socioeconomic Analysis	23
B. Social Dimensions	26
VI. ASSURANCES	26
VII. RECOMMENDATION	27
APPENDIXES	28

LOAN AND PROJECT SUMMARY

Borrower	:	Malaysia
Project Description	:	<p>The Project will assist the Government in improving the quality and expanding the capacity of the technical education system. To enhance the effectiveness of technical education delivery, the Project will support the introduction and development of contextual learning, a methodology that emphasizes the use of practical applications to teach/learn technical subjects; the piloting of "smart" schools using advanced information technology; and the development of related learning materials and the educational management information system. To effect these changes, the Project will strengthen technical and pedagogical teacher training, and management and staff training at the school level. The Project will provide for the establishment of four new secondary technical schools (STSs) offering engineering subjects and piloting the "smart" school concept, and the upgrading of 17 secondary vocational schools into STSs.</p>
Classification	:	Human Development
Environmental Assessment	:	<p>Category C</p> <p>Environmental implications were reviewed, and no significant adverse impacts were identified.</p>
Rationale	:	<p>Rapid economic growth; continuing expansion of employment; and continuing industrial expansion and restructuring have led to persistent shortages of production workers with advanced industrial skills and of research and development engineers. Both are essential to developing industrial capabilities and increasing total factor productivity, which is a key objective of the Seventh Malaysia Plan (7MP) covering 1996-2000. To meet these needs, under the 7MP the Government is strengthening technical education at all levels. The STS system is one of the major stepping stones in the education of both technically qualified workers and entrants to higher technical programs at polytechnics and universities. The upgrading and expansion of the STS system will improve the quality and increase the numbers of STS graduates going into further education and employment, and is a key element in the Government's strategy to address qualitative and quantitative skill shortages.</p>
Objectives and Scope	:	<p>The development objective of the Project is to improve the quality and expand the capacity of the technical education system in support of increasing the technology intensity and efficiency of production. The Project has three immediate objectives: (i)</p>

improving the quality of technical education, including management, curriculum, and delivery methodologies; (ii) strengthening staff development and teacher training; and (iii) expanding and upgrading facilities and equipment for technical education in general, and information technology in particular.

The Project components are the following:

- (i) strengthening technical education organization, management, and delivery by (a) developing new teaching/learning approaches involving contextual learning and the piloting of "smart" STSs using advanced information technology; (b) developing new curriculum and learning materials; and (c) management development, including capacity building and the development of management information systems and benefit monitoring and evaluation;
- (ii) strengthening staff development, in particular (a) teacher training programs to enhance pedagogical and technical skills related to new learning approaches; and (b) management and staff training at the school level for principals, administrators, and support staff; and
- (iii) establishing and upgrading STS facilities and equipment, including (a) establishing four new STSs offering engineering subjects and piloting the use of "smart" technology, and (b) upgrading 17 secondary vocational schools into STSs and providing them with the physical facilities and equipment to offer technical electives.

Cost Estimates : The total cost of the Project is estimated at \$127.0 million, of which the foreign exchange cost is \$54.2 million (about 43 percent), including \$9.2 million for interest and other charges on the Bank loan during construction, and the local cost is \$72.8 million equivalent (about 57 percent).

Financing Plan : (\$ million)

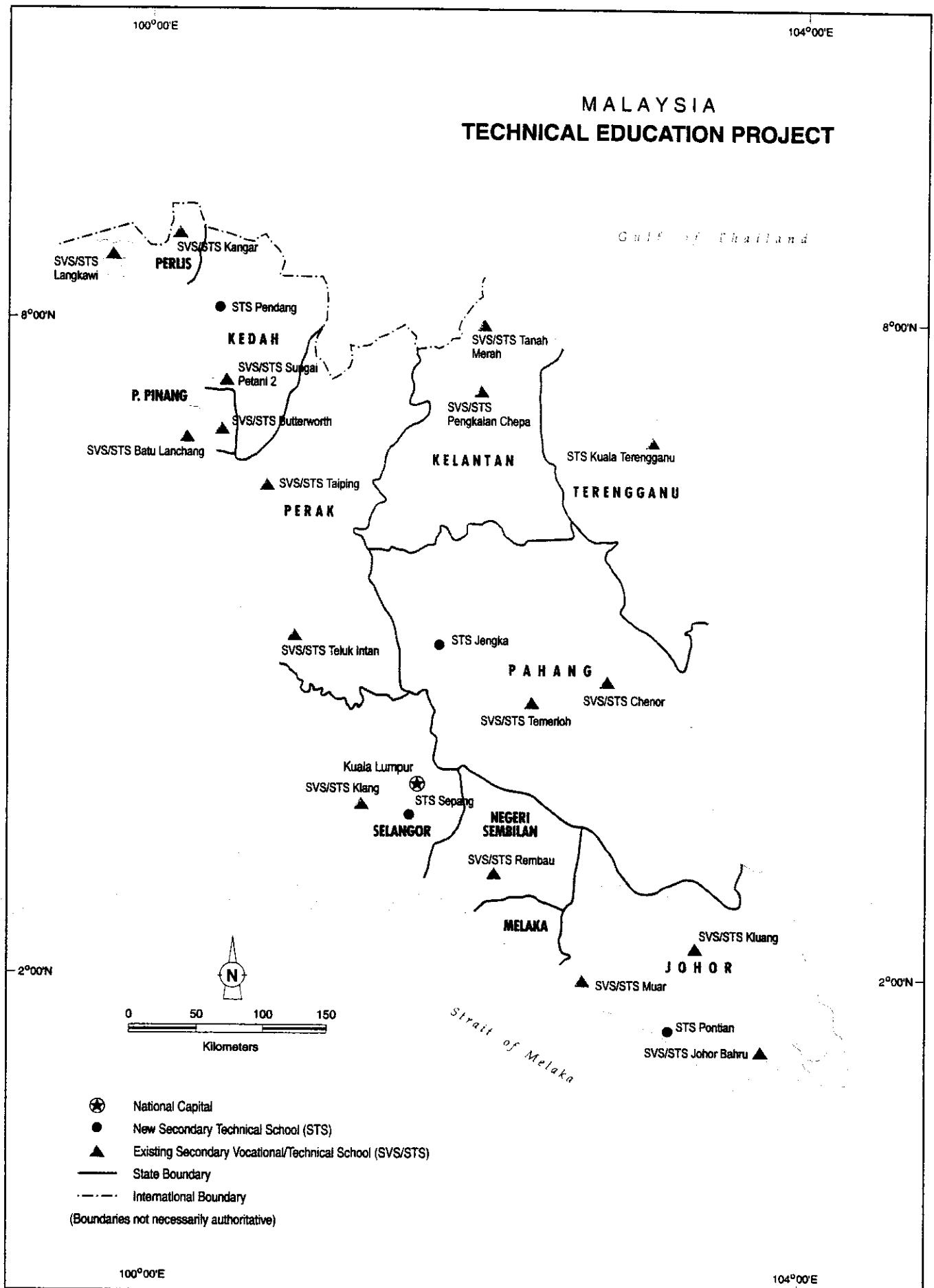
Source	Foreign Exchange	Local Currency	Total Cost	Percent
Bank	40.0	0	40.0	31
Government	14.2	72.8	87.0	69
Total	54.2	72.8	127.0	100

Loan Amount and Terms	:	It is proposed that the Bank provide a loan of \$40.0 million to finance the foreign exchange base costs of the Project. The Government will finance the remainder of the cost of the Project of \$87.0 million equivalent. The Government will finance part of the foreign exchange costs including contingency allowances and interest and other charges during construction as well as the entire local currency costs of the Project. The proposed loan will have an amortization period of 20 years including a grace period of 5 years, with an interest rate determined in accordance with the Bank's pool-based variable lending rate system for US dollar loans and a commitment charge of 0.75 percent per annum.
Period of Utilization	:	Until 30 June 2003
Executing Agency	:	Ministry of Education
Implementation Arrangements	:	The Project will be managed by a Project Implementation Unit within the Development, Privatisation and Supply Division of the Ministry of Education. A Project Coordination Committee will provide policy guidance and intersectoral coordination.
Procurement	:	All procurement of equipment, furniture, and instructional and consumable materials to be funded from the proceeds of the Bank loan will be in accordance with the Bank's <i>Guidelines for Procurement</i> . The civil works contracts for the four new STSs will be awarded on the basis of international competitive bidding, in accordance with the Bank's <i>Guidelines for Procurement</i> . All other civil works contracts will be awarded on the basis of local competitive bidding among prequalified bidders in accordance with procedures acceptable to the Bank.
Consulting Services	:	The Project will require a total of 332 person-months of consulting services, including 96 person-months of international and 236 person-months of domestic services. All consultants will be engaged by the Government in accordance with the Bank's <i>Guidelines on the Use of Consultants</i> and Government procedures for the engagement of domestic consultants acceptable to the Bank.
Estimated Project Completion Date	:	31 December 2002
Project Benefits and Beneficiaries	:	The Project will improve the quality and increase the graduate output of the upper secondary STS system, thus contributing to

strengthening the capacity of the technical education system at subsequent levels (post-secondary and tertiary). The Project will expand the enrollment capacity of the STS system by about 17,440 student places. The immediate beneficiaries of the Project will be the 29,060 students enrolled in the four new and 17 upgraded STSs at Project completion. The beneficiaries also include approximately 3,400 teachers, principals, planners, and other staff who will receive training under the Project. By supporting qualitative improvements in the curriculum, teaching/learning methods, and instructional materials, the Project will benefit all students enrolled in STS courses. By improving the quality and strengthening the flow of engineers and skilled workers, the Project will benefit industry and commerce, both in areas near the new and upgraded STSs and throughout the country.

**Technical
Assistance**

: A technical assistance (TA) grant of \$500,000 will be provided to assist the Economic Planning Unit of the Prime Minister's Office in undertaking a Strategic Review of Technical Education and Skill Training as a basis for policy review and planning, including the preparation of the Eighth Malaysia Plan (2001-2005) and the Third Outline Perspective Plan (2001-2020). The TA will be financed from the Japan Special Fund. The TA will require a total of 35 person-months of consulting services, including 15 person-months of international and 20 person-months of domestic services. The consultants will be selected by the Bank in accordance with its *Guidelines on the Use of Consultants*.



I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on a proposed loan to Malaysia for the Technical Education Project. The Report also describes proposed technical assistance (TA) for Strategic Review of Technical Education and Skill Training, and if the proposed loan is approved by the Board, I, acting under the authority delegated to me by the Board, shall approve such TA.

II. INTRODUCTION

2. The Bank has supported the Government of Malaysia in strengthening the technical and vocational education (TVE) system at the upper secondary level since 1980 through three vocational education projects¹ and the Technical and Vocational Education Project (TVEP),² which was approved in 1995. The first three projects were intended to meet the economy's rapidly growing need for skilled labor; they supported qualitative improvement and quantitative expansion of the vocational education system by upgrading existing secondary vocational schools (SVSs) and establishing new SVSs in selected locations throughout Peninsular Malaysia. TVEP, which became operational in January 1996, is intended to address the industry sector's growing need for advanced technical skills including technicians and engineers, as well as the continuing need for skilled workers. The project is providing support for both SVSs and the upgrading of existing and establishment of new secondary technical schools (STSs). While SVS graduates generally enter gainful employment, STS courses are intended to prepare graduates for further technical education, mainly in polytechnics and universities. To ensure that students from throughout the country have access to TVE, in addition to supporting schools in Peninsular Malaysia TVEP provides for the upgrading of all 13 existing SVSs in Sabah and Sarawak and the establishment of one new STS in Sarawak.

3. The Country Operational Strategy Study mission of the Bank to Malaysia in November 1996 reached agreement with the Government that human development should be one of the principal objectives for the Bank's operations in the country during the Seventh Malaysia Plan (7MP) period (1996-2000). In the context of the shortage of engineers and skilled workers, it was agreed that further developing the technical education system was a priority area for Bank support and that such support should be accelerated in line with Government efforts under the 7MP to address these shortages. It was also agreed that further Bank support for technical education should be coordinated closely with the support being provided under TVEP. A review of labor market needs, the geographical coverage of the TVE system, and the inputs provided under TVEP indicated that current and anticipated labor market needs and social demand for TVE in Sabah and Sarawak were adequately met under TVEP and that priority areas for further support were in strategic locations in Peninsular Malaysia. In February 1997, the Bank approved TA to prepare a Technical Education Project (the Project).³ The TA was completed in April 1997.

¹ Loan No. 476-MAL: *Vocational Education Project*, for \$20.0 million, approved on 30 October 1980; Loan No. 673-MAL: *Second Vocational Education Project*, for \$58.0 million, approved on 20 December 1983; and Loan No. 840-MAL: *Third Vocational Education Project*, for \$68.0 million, approved on 1 September 1987.

² Loan No. 1355-MAL: *Technical and Vocational Education Project*, for \$72.0 million, approved on 31 May 1995.

³ TA No. 2761-MAL: *Technical Education Project*, for \$100,000, approved on 12 February 1997.

4. An Appraisal Mission (the Mission)¹ visited Malaysia from 25 August to 13 September 1997 to review and finalize the technical, financial, institutional, and social aspects of the Project. This report is based on the consultants' report; the Mission's findings; and discussions with Government ministries, state education officials, and principals, teachers, administrative staff, and students of the institutions covered by the Project. The Project framework is in Appendix 1.

III. BACKGROUND

A. Subsector Framework

1. Technical and Vocational Education

5. Education in Malaysia is the responsibility of the Federal Government, with administrative and financial control of formal education vested in the Ministry of Education (MOE). The responsibility for nonformal education and various forms of skills training is shared by MOE, other Government ministries, and the private sector. An organizational chart of MOE is in Appendix 2.

6. The formal education system in Malaysia has a 6-3-2-2 pattern, consisting of six years of primary, three years of lower secondary, two years of upper secondary, and two years of postsecondary education. Primary education aims to provide a foundation in writing, reading, and arithmetic. At the completion of lower secondary education, pupils take the Lower Secondary Assessment. At the upper secondary level pupils are channeled into academic, technical, vocational, or religious streams, depending on their performance in the Lower Secondary Assessment. Academic schools concentrate on arts and science, while STSs offer electives in technical subjects. Both schools prepare students for the Malaysian Certificate of Education (MCE). Students in SVSs are not required to study additional math or specific science subjects, but are required to take ordinary math and general science. They choose from a range of vocational subjects leading to the Malaysian Certificate of Education - Vocational (MCE[V]). The MCE is required for advancement to postsecondary and tertiary education (at the polytechnic, college, and university levels), while the majority of students leaving SVSs with the MCE(V) enter employment.

7. TVE² as well as skill training, producing semiskilled and skilled industrial workers and technicians, is offered by various types of educational and training institutions. Public institutions play the leading role. In addition to the network of SVS/STSs under MOE, vocational and industrial training institutes are administered by the Ministry of Human Resources (MOHR), the Ministry of Youth and Sports (MOYS), and the Majlis Amanah Rakyat (MARA)³ under the Ministry of Entrepreneurial Development. All skill training-related standards and certification are coordinated by the National Vocational Training Council (NVTC), which includes representation from the Government and the private sector.

8. While the Government remains the main provider of education and skill training, there have been significant efforts to expand the role of the private sector. In 1992, to stimulate

¹ The Mission comprised R. Wihtol (Project Economist/Mission Leader), B. Hitchcock (Programs Officer), and O. Tiwana (Counsel). The Mission was assisted by S. Mendoza (Education Facilities, Equipment, and Costing Expert), who was engaged under TA No. 2761-MAL.

² Defined as formal technical and vocational education leading to the MCE or MCE(V).

³ The Council for Advancement of Indigenous Peoples.

private sector involvement in the training and retraining of workers, the Government established the Human Resources Development Fund (HRDF). Under this arrangement, manufacturing firms with 50 or more employees are required to contribute 1 percent of their monthly payroll to the HRDF, with a matching contribution by the Government. Participating firms are eligible for training grants to upgrade the skills of their workers. In 1995, the coverage of the HRDF was expanded to smaller enterprises, selected services industries, and a wider range of training and retraining programs. To encourage on-the-job training, a new apprenticeship scheme is also being introduced, which will be eligible for reimbursement under the HRDF. In addition, the private sector, in close cooperation with the state governments, has taken the initiative of establishing skill development centers in connection with industrial zones to meet directly the skill development needs of advanced industries. The Penang Skill Development Center, which was established in 1989, pioneered this development, and by 1996 eight similar centers had been established in other states.

9. In 1996, the Government passed the Private Higher Education Institutions Act, which is intended to encourage the private sector to establish degree-granting institutions and enables foreign universities to set up branch campuses in the country. This is expected to increase significantly the domestic capacity to produce higher-level knowledge and skills. Training and educational institutions managed by major corporations, such as the National Petroleum Corporation, the National Power Company, and Telekom Malaysia, are also expanding their capacities, particularly in engineering and technical fields.

10. MOE currently offers TVE programs at the upper secondary level (Grades 10-11), administered under the Technical Education Department (TED) through 17 STSs (nine fully operational, and an additional eight being established with financial support from the Bank under the TVEP). A further four new STSs are planned during the 7MP period. The 69 SVSs were redesignated as STSs in 1996 and are currently undergoing appropriate upgrading and restructuring. For the foreseeable future all upgraded schools will offer both technical and vocational programs leading to the MCE and MCE(V), respectively. The original nine STSs and the new STSs to be constructed during the 7MP period will offer only technical programs leading to the MCE.¹

11. The SVS/STSs also offer skill training programs for those lower secondary school graduates who did not follow the MCE or MCE(V) programs. Graduates of the skill training programs can take trade tests conducted by NVTC. However, the 7MP envisages that these skill programs, as well as the vocational programs leading to the MCE(V), will eventually be phased out and their facilities and equipment will be absorbed into the mainstream STS programs. The responsibility for the skill programs will be transferred to other designated ministries when they have developed adequate capacity to take over this function from MOE.

12. In 1996, the 9 STSs and 69 SVSs/STSs had total enrollments of 10,424 technical students (32 percent female) and 37,649 vocational students (26 percent female), respectively. Data on enrollments are in Appendix 3, and data on female participation in TVE are in Appendix 4.

13. Technical and vocational teachers obtain their academic and teaching qualifications mainly at universities, while some have been trained at the Technical Teachers

¹ This report refers to technical schools offering the MCE as STSs, and vocational schools being upgraded to technical schools offering both the MCE and MCE(V) as SVS/STSs.

Training College (TTTC). There are also twinning arrangements with some local universities for degree courses for secondary technical and vocational teachers. TTTC has a twinning program with Universiti Teknologi Malaysia, which produces about 60 engineering teachers annually for the total STS system. As additional private universities are established under the Private Higher Education Institutions Act it is expected that the private sector will play an increasing role in educating technical and vocational teachers, but at present there is a backlog of demand for both preservice and in-service training and retraining. In the context of the ongoing upgrading of SVSs to STSs, policies regarding the preparation and upgrading of teaching staff are currently under review. In-service training for principals, including those assigned to SVSs and STSs, was in the past provided by Institut Aminuddin Baki, but is also under review.

14. In recognition of the importance of education for the country's economic development, basic (primary and lower secondary) education as well as general, technical, and vocational education at the upper secondary level are all fully financed from the Government budget. There is limited cost recovery at the postsecondary and university levels. Recent policies place growing emphasis on private sector participation in TVE, improving the internal efficiency and cost effectiveness of TVE through improved management practices and information systems, and the role of private higher education institutions (see paras. 8-9).

15. Government expenditure on education as a share of gross national product averaged 5.5 percent from 1991 to 1996. This is higher than the corresponding figure in neighboring countries such as Thailand (3.8 percent), Philippines (2.4 percent), and Indonesia (2.1 percent). Education expenditure as a percentage of total Government expenditure averaged 17.1 percent, and technical education expenditure as a proportion of education expenditure averaged 16.6 percent from 1991 to 1996. Figures on education expenditure are in Appendix 5.

2. Demand for and Supply of Skilled Labor

16. Between 1990 and 1996 the Malaysian economy grew at a vigorous pace as a result mainly of strong export performance, expanding domestic demand, and the continued inflow of foreign investment. Economic growth was strongest in the manufacturing sector, which is currently undergoing a transition from focusing on assembly operations and an increase of domestic value-added to expanding the technology intensity and efficiency of production. The country is making an effort to expand rapidly into knowledge-based and high-technology industries in order to sustain the competitive position of its export production. Despite recent currency and financial sector instability, economic growth and industrial expansion are expected to continue.

17. The economy is in a state of virtually full employment, with a tight labor market, and is experiencing significant shortages of skilled labor. Strong growth performance in the early 1990s was accompanied by a rapid increase in employment, particularly in manufacturing and construction. The expansion of jobs exceeded projections, and unemployment declined from 5.1 percent in 1990 to 2.6 percent in 1996. Compounded by the country's relatively small labor supply base, this has led to labor shortages in most sectors of the economy, which are expected to persist throughout the 7MP period. A recent Bank study noted that shortages of high-level technical and other skills constitute the largest single threat to Malaysia's export sustainability.¹ The tight employment situation has led the Government to permit selective employment of

¹ Asian Development Bank. 1995. *Malaysia's Export Performance and Its Sustainability. Phase II: Competitiveness*. Manila.

foreign workers. Of a total workforce in 1996 of 8.2 million, about 0.7 million were legally employed as foreign workers. A further 1.0 million foreign workers were estimated to be employed illegally.

18. The projected employment of and demand for labor in major occupation groups and sectors up to 2000 are shown in Appendix 6. Based on 7MP projections, between 1997 and 2000, total employment is expected to expand by 0.9 million, with most of the expansion taking place in manufacturing (0.4 million new jobs), services (0.3 million new jobs), and construction (0.1 million new jobs). Government projections indicate that during the 7MP period there will be demand for about 498,000 additional production workers. In the context of the ongoing industrial restructuring and the increased use of automation and robotics, many production workers will need computer literacy and an ability to work with automated machinery. There will also be demand for about 282,000 additional professional and technical workers, mainly engineers and engineering assistants. These projections indicate that over the 7MP period, about 100,000 additional production workers and 56,000 professional workers will be required each year, of whom about 21,000 will be engineers and engineering assistants.

19. The total annual capacity of public and private educational and training institutions to produce skilled and semiskilled manpower was about 34,600 in 1995. Even with the significant increase of annual capacity to about 52,000 expected by the end of 7MP, including the expansion of the capacity of the STS system, significant shortcomings will remain in the capacity of the system to meet demand. Similarly, even with the increase in capacity to educate engineers and engineering assistants expected during the 7MP period, annual output is expected to fall short of demand by about 8,000.

3. Major Issues in the TVE Subsector

20. There have been significant achievements in the TVE subsector since the 1980s, including a substantial increase in the quantitative capacity of buildings and facilities, accompanied by a corresponding increase in enrollments; major improvements in quality and relevance as reflected by improvements to curriculum, upgraded instructional materials, additional equipment, and improvements in the qualification and experience of teachers; and improved access and participation of disadvantaged students from low-income families and rural areas, as well as female students. However, some concerns have persisted, and recent economic, industrial, and labor market developments have led to the emergence of a number of new issues.

21. The TVE curriculum, the technical electives offered, and teaching and delivery methodologies are in need of continuous review to ensure that they keep pace with rapid changes in production and information technologies and the demand for engineers, engineering assistants, and skilled production workers. The upgrading of SVSs to STSs will entail a significant increase in enrollments in technical programs and highlights the importance of a review of teaching and learning methodologies to facilitate the learning of technical subjects, particularly by students with average abilities. To address these issues, MOE is undertaking a major review of TVE programs through the introduction of contextual learning as a delivery methodology, the piloting of "smart" schools using advanced information technology, and a review and expansion of the technical electives offered by STSs (see paras. 30-36).

22. The upgrading and expansion of the STS system and the ongoing changes in the curriculum and delivery modalities will entail significant changes in staffing and staff

development. In line with MOE policies, virtually all teachers at existing STSs hold university degrees, while the 69 SVS/STSs have both nongraduate and graduate teachers. In January 1997, the SVS/STS system employed a total of 5,150 teachers (35.7 percent female), of whom 2,263 (43.9 percent) held a degree. In the context of the upgrading program, MOE will need to review the qualifications of teachers and initiate appropriate measures for upgrading, retraining, and redeployment.

23. The principal issues facing the subsector are summarized below:

- (i) The country's strategy of increasing the technology intensity of production requires a continued strengthening of science and technology education, in particular qualitative upgrading and quantitative expansion of the education system's capacity to produce engineers and technicians.
- (ii) The capacity of the vocational education and skill development system requires expansion to meet persisting demand for skilled and semiskilled workers, and to reduce dependence on foreign workers.
- (iii) To ensure that TVE programs keep pace with industrial needs, particularly in the effective teaching of technical subjects and delivery of knowledge and skills related to advanced information technology (IT), the curriculum, teaching, and delivery methods need to be reviewed and further developed.
- (iv) To ensure that TVE programs keep pace with industrial needs and new teaching methodologies, the technical qualifications, experience, and pedagogical skills of teachers require continuous upgrading and development. Actual shortages of teachers in specific levels or subject areas may also emerge and need to be addressed.
- (v) The efficiency of the TVE subsector needs to be further enhanced, in particular by reviewing and strengthening the use of management information systems, and through staff development programs for STS principals and support staff.

B. Government Policies and Plans

1. The Seventh Malaysia Plan

24. During the 7MP period, the Malaysian economy was projected to expand at 8.0 percent per year, with manufacturing providing 37.5 percent and services 45.7 percent of gross domestic product. The 7MP sets the scene for further developments in the manufacturing sector, with emphasis on increasing total factor productivity, particularly through qualitative improvements in human resources. The importance of deploying new technology is also stressed in the Second Industrial Master Plan, which highlights the need to strengthen the research and development (R&D) capabilities of industry, and by such projects as the multimedia super corridor, which will be located adjacent to Kuala Lumpur and is intended to attract international investors in the field of IT.

25. Human resource development (HRD) continues to be a major priority under the 7MP. During the Sixth Malaysia Plan period (1991-1995), education and training programs focused on expanding the capacity of institutions, improving the quality of manpower, and

increasing the accessibility and participation of low-income groups. During the 7MP, emphasis is shifting to strengthening and improving the system through (i) improving the quality and increasing the quantity of output, particularly in science and technology; and (ii) continuing to expand educational opportunities for those in rural areas. In the context of prevailing full employment, to sustain the anticipated level of growth and achieve higher productivity levels are major objectives of the 7MP. To this end and to help the economy move to the forefront of new, knowledge-intensive technologies, the 7MP places emphasis on upgrading labor force skills, improving managerial competence and initiative, and advancing scientific and technological expertise.

26. The strategic policy thrusts of the 7MP related to HRD include (i) encouraging greater technology intensity of production to save on the use of labor, thereby reducing reliance on foreign labor; (ii) increasing the utilization of local labor, including raising female labor force participation; (iii) enhancing labor productivity through skill training and retraining; (iv) improving the TVE and skill delivery system and expanding its facilities to increase the supply of skilled and knowledge-based manpower; (v) increasing the supply of R&D personnel, including scientists and technologists; (vi) promoting greater participation of the private sector in HRD, to complement Government efforts; (vii) promoting mechanisms that link wages to productivity; and (viii) removing bottlenecks in the labor market through improved labor market information systems.

27. In addition to the expansion and upgrading of institutional capacities, specific measures of relevance to TVE highlighted in the 7MP include (i) strengthening the delivery system through the provision of qualified and experienced teachers and instructors and the greater utilization of modern technologies and computers; (ii) improving accessibility and increasing participation at all levels; and (iii) improving the management and implementation of education and training programs by enhancing managerial capability and strengthening monitoring and evaluation systems.

28. Specific measures to be undertaken during the 7MP period include expanding the capacity for training skilled workers, specifically by expanding the network of training centers under MARA, establishing six new youth skill institutes under MOYS, and establishing nine new industrial training institutes under MOHR. At the secondary level, science and mathematics education is being strengthened to ensure that students have a solid foundation for subsequent levels of education, including upper secondary TVE. Increased private sector involvement in training and retraining is being encouraged by the establishment of an apprenticeship scheme and the expansion of the coverage of the HRDF (see para. 8). The Private Higher Education Institutions Act is also expected to encourage the private sector to establish more tertiary-level institutions.

29. At the upper secondary level, the Government is comprehensively upgrading the quality and expanding the quantitative capacity of the STS system. In addition to nine existing STSs and a further eight being established with Bank support under TVEP, under the present Project the Government will establish four new STSs in strategically located areas. As foreseen in the 7MP, all 69 SVSs are being upgraded to STSs, mainly through an expansion of classroom facilities and laboratories, the provision of IT equipment, and staff and teacher training and retraining. The upgrading of 40 SVSs was started during the Sixth Plan period (including 31 SVSs being upgraded with Bank support under TVEP), and the remaining 29 SVSs will be upgraded during the 7MP period. The upgrading of SVSs to STSs is taking place in three phases. Twenty SVSs upgraded into STSs under the first phase had their first intake of technical stream students in 1996, 31 will have their initial intake in 1997, and the remaining 14 will start

offering technical courses in 1998.¹ By 2002, the country is expected to have a total of 90 STSs, of which 21 will offer only technical courses and 69 will offer both technical and vocational courses and some skill programs. In 2002, the total enrollment capacity of the STS system, including MCE, MCE(V), and skill programs, is expected to be about 92,600, with an annual output of about 43,700.

2. Technical Education Policies and Programs

30. In support of the expansion and upgrading of the STS system, and in line with the requirements for higher technical education and the needs of industry and commerce, MOE is undertaking a major review of the TVE curriculum and delivery modalities. The review is focusing on two major issues, the introduction of contextual learning as the main approach to the teaching/learning process, and the piloting of "smart" schools that make extensive use of advanced information and educational technology for their program delivery.

31. Contextual learning, or applied academics, entails teaching/learning technical subjects in an applied or practical context. The approach is applicable at all levels of student ability, and is particularly suitable for subjects that have traditionally been taught in abstract terms. For example, in mathematics students are encouraged to apply mathematical principles to resolve practical problems, after first reviewing how the problems relate to everyday or workplace-related situations. Contextual learning strengthens links between the curriculum and practical applications, and highlights relationships between different parts of a curriculum. It can attract students to science and mathematics subjects by making clear to them the relevance of their studies to practical and work-related situations.

32. The comprehensive introduction of contextual learning requires a major revision of existing curricula; the preparation of new learning materials and teachers' guides; adjustments to the way subjects are taught and tested; and the review of preservice and in-service teacher training programs. It also requires a comprehensive implementation strategy, sequenced implementation plan, and careful monitoring and evaluation during initial implementation to ensure that appropriate adjustments are made to ensure effective implementation.

33. To support Malaysia's development to an industrial economy with advanced, knowledge-based industries, MOE is introducing "smart" schools with advanced computer and multimedia technology. "Smart" schools are part of a broader shift from teacher-centered to student-centered learning, supported by a flexible curriculum and advanced technology. In 1996 MOE established a task force to review all aspects of developing "smart" schools and prepare detailed guidelines for their introduction at all levels of formal education, including STSs. MOE will pilot the introduction of "smart" schools during the 7MP period, and subsequently plans to introduce the concept more broadly based on the initial experience gained. The MOE task force is building on experience gained in other countries and is currently developing an implementation strategy together with examples of curriculum, materials, and teaching guides for piloting in a selection of schools, including one STS.

34. "Smart" schools are oriented towards learning rather than teaching. Students are given access to advanced IT, making the acquisition of knowledge and skills more flexible and open to individual user needs. "Smart" schools encourage investigative and deductive processes

¹ The four home economics STSs may offer a limited range of technical electives at a later stage.

that support the development of students' problem-solving capabilities. The use of up-to-date technology helps students prepare themselves for the workplace. "Smart" schools support the Government's industrial development policies and programs, in particular the strengthening of industry's R&D capabilities and the further development of knowledge-based industries. The concept also supports contextual learning, by providing a learning environment that facilitates practical applications.

35. The four new STSs being established under the 7MP will be designed, built, and equipped as "smart" schools. These STSs will pilot the concept, giving MOE and TED an opportunity to review the broader implications of the change, including such issues as teacher training and retraining; learning materials and instructional software development and provision; examination standards and techniques; interface with other levels of education; and the costs of equipping and maintaining "smart" schools at the forefront of technology. The introduction of "smart" schools in rural and remote areas will need careful review and may require specific support measures to ensure that students at entry level have the necessary basic computer and keyboard skills.

36. In the context of the upgrading of SVSs to STSs MOE is undertaking a review of elective subjects in the technical curriculum. Engineering is broken down into three areas: mechanical, civil, and electrical. Some subjects currently offered in the vocational stream are being considered for elevation to technical subjects and eligibility for the MCE. Home economics has been reviewed with the concerned industry councils and may be considered as a technical elective. SVS/STSs currently offering horticulture and landscaping at the vocational level will shortly be offering agrotechnology as a new technical subject at the MCE level. MOE is also developing entrepreneurship as a technical elective. The introduction of new technical electives is part of a continuous process of curriculum development. In developing new electives, MOE is taking care to ensure that overall MCE standards are maintained; that the associated vocational level courses remain in place wherever there is demonstrated labor market demand, pending the resolution of the future of the vocational stream; and that the upgraded curricula match the needs of relevant industries and the requirements of the education system at subsequent levels.

37. To meet the staff and teacher development needs of these changes, MOE is undertaking a substantial teacher upgrading, redeployment, and recruitment program. Of the total of 5,150 teachers in the STS system, 2,887 (56 percent) are nongraduates, and many will need to upgrade their professional credentials or be retrained. Approximately 1,200 nongraduate teachers are teaching skill or vocational programs that are being scaled back and will eventually be discontinued; they will need to be redeployed.¹ To meet demand in the expanded and upgraded STS system, MOE plans to recruit about 114 graduate teachers in 1999 and a further 234 in 2001.

38. The technical and pedagogical knowledge and skills of STS teachers will need to be upgraded in line with changes in curriculum and teaching methodologies. The responsibilities of STS administrative and support staff, including principals, senior assistants, technicians, laboratory assistants, equipment maintenance and repair staff, and wardens, will change as a result of the upgrading and expansion of the STS system and the introduction of

¹ No nongraduate teachers will lose tenure with MOE. If teachers are not eligible for upgrading under Government-financed degree programs, they will be offered alternative teaching jobs in other MOE schools.

"smart" technology. Developing training programs for management and support staff at the school level will require priority attention.

39. There is also a need to review training requirements of TED staff responsible for technical education policy, planning, and the network of SVS/STSs. TED has 79 professional staff to cover the policy, planning, management, administration, and technical curriculum development related to polytechnics and the SVS/STSs system. In the context of the changes taking place in the SVS/STS system and the need to monitor and review progress, obtain feedback, and make necessary adjustments, there is a need to upgrade TED staff capabilities in R&D and program management. Ongoing and planned changes highlight the need for TED to have strong management information systems and the ability to use management information for planning, monitoring, and evaluation. The foundation is being established under TVEP and will require further development.

40. Developments in TVE require continued and strengthened cooperation with industry. MOE is working closely with industry councils in planning TVE programs, including curriculum and learning materials development. At the school level, cooperation will continue through established mechanisms including school advisory committees, with representatives from local industries, the community, and the STSs; and career guidance, industrial liaison and placement units. It will be important to ensure that employers and industry are closely involved in the promotion of contextual learning, to maximize the benefits of the approach in improving industrial productivity.

41. Apart from commitments to contextual learning and "smart" schools, the Government continues to give priority to providing greater access to TVE for the socially disadvantaged, to provide them with employable skills and increase their employment and income opportunities. The Government has put into place and will maintain policy measures to promote equitable access to TVE, in particular by providing hostel accommodation and subsidizing the living costs of selected students.¹ In 1996, 56.7 percent of the total STS/SVS enrollment used hostel accommodation and benefited from subsidies. These measures have improved access to TVE for students from poor families and rural areas, and have encouraged women's participation in TVE. STS facilities also include some staff quarters to attract and retain qualified teachers.

C. External Assistance to the Sector

42. The World Bank has provided 12 loans to the education sector for a total of \$695 million, covering primary and secondary education, industrial training, polytechnic education, and higher education. Its most recent loan to develop polytechnic education was approved in 1993 and is currently nearing completion. To ensure complementarity of the support provided, the Bank has coordinated with the World Bank during Project processing. External assistance for the education sector is summarized in Appendix 7.

43. Bilateral aid has declined in recent years as a result of Malaysia's rapid economic growth and rising income levels. Germany has provided support for the establishment of the Germany-Malaysia Institute, and France for the French-Malaysia Institute, which provide

¹ Criteria for eligibility include the level of family income, place of origin, and distance of place of residence from school.

advanced training in engineering technology. Support for external fellowships continues, and many Malaysian students benefit from periods spent at various levels of higher education and training, mostly in Australia, France, Germany, Japan, United Kingdom, and United States. The Government continues to promote policies that encourage the role of the private sector in education, and as a result there are an increased number of twinning arrangements between foreign and Malaysian universities, and specialized branch faculties of foreign universities established in Malaysia, mainly in medicine, engineering, and management.

D. Lessons Learned

44. The Bank has assisted the Government in strengthening TVE since 1980 through three vocational education projects and TVEP (see para. 2). The first three projects supported qualitative improvement and quantitative expansion of the vocational education system by upgrading existing SVSs and establishing new ones in selected locations. All three projects have been completed. The project completion reports for the three projects concluded that they achieved their objectives and enhanced the status of vocational education in Malaysia. The project performance audit reports for the Vocational Education Project and the Second Vocational Education Project concluded that they were successful in laying the foundations for implementing qualitative improvements in vocational education in the country, enhancing staff competencies, and increasing the efficiency of the SVSs.

45. The major lessons learned from the first three projects are the need for (i) careful site selection and preparation; (ii) horizontal coordination between project components; (iii) frequent revision and review of the TVE curriculum and programs to keep pace with rapidly changing industrial needs; (iv) mechanisms to improve school-industry linkages and the placement of graduates; (v) benefit monitoring and evaluation (BME) as a management tool in the framework of an educational management information system (EMIS); (vi) strengthening TVE teacher training programs; and (vii) enhanced efficiency through strengthened management, cost reduction, and cost recovery.

46. TVEP is providing support for the establishment of 8 new STSs; upgrading of 9 existing STSs; upgrading of 31 SVSs to STSs; strengthening of TTTC; and policy reforms and strengthening management capacity in a number of areas including industrial liaison, career guidance, curriculum development, and BME. The loan became effective in January 1996. The project has made significant progress in the planning, tender, and award of civil works contracts; implementation of external fellowships; and planning of consultant services and R&D activities. The lessons learned from the initial implementation include (i) the need to ensure that teacher training keeps pace with changes in the TVE curriculum and programs; (ii) the importance of BME and labor market information as management tools; and (iii) the need for the Bank and the Government to coordinate closely in procurement of civil works contracts, to avoid implementation delays. The implementation status of TVEP is summarized in Appendix 8.

47. The issues identified and the recommendations made to address them have been considered in the subsequent design of the Project. The organization and management of the TVE subsector; staff development priorities; need for civil works, equipment, and learning materials; and implementation arrangement have been reviewed in close cooperation with the Government in the light of the lessons learned. Suitable measures have been undertaken by the Government and incorporated into the Project.

E. The Bank's Sector Strategy

48. The objective of the Bank's operational strategy in Malaysia is to support socioeconomic development in selected areas where the Government continues to require external support. In the context of Malaysia's growth strategy, human resources continue to be a major constraint and a key area for further Bank support. The Bank's sectoral strategy will focus on (i) strengthening the capability of the technical education system to provide science and technology graduates at the secondary level, in support of the increased use and adaptation of skill-intensive technologies; (ii) strengthening the capacity of the TVE system to produce skilled labor; (iii) further improving access of students to TVE, and encouraging participation in TVE of students from rural and remote areas, and from lower income areas, and female students; and (iv) enhancing the efficient functioning of the labor market, to ensure a close match between TVE and changing skill requirements of industry and commerce.

F. Policy Dialogue

49. In the context of its education sector lending program in Malaysia, the Bank has maintained a continuous policy dialogue with the Government. In 1990, the Bank approved TA for a Technical and Vocational Education and Industrial Training Study,¹ which assisted the Government in formulating a medium and longer term action plan, served as an input to the finalization of the Sixth Malaysia Plan, and provided a basis for the processing of TVEP with a focus on expanding and strengthening the SVS/STS system. Following the shift of the Malaysian economy from a situation of labor surplus to full employment by 1994, in response to the Government's concern to enhance the responsiveness of labor market information to the needs of policy planners and other end users, the Bank in 1996 approved a TA to upgrade the labor market information system.²

50. During the processing of the Project, the Bank discussed with the Government issues related to the structure, organization, and policy framework of the technical education and skill training (TEST) system. The entire system is under considerable pressure as a result of continuing rapid economic, industrial, and technological development and persistent skill shortages. The Project will address priority needs in strengthening and further developing the public provision of technical education through the SVS/STS system. However, as SVSs are upgraded to STSs, the Government proposes gradually (during and beyond the 7MP period) to shift responsibility for skill training, which is at present offered by SVSs as well as industrial training institutes under other Government agencies, fully to other Government agencies. The longer term future of vocational programs in the SVS/STS system is still under review. To ensure that responsibilities are shifted in a coordinated manner and that there is no hiatus in skill training capability and provision will require close coordination among programs of different Government agencies and the private sector.

51. While the Government remains firmly committed to financing public TVE at the upper secondary level, there is a growing concern to ensure the efficient use of resources and encourage complementary private sector funding for TVE, skill training, and the education sector

¹ TA No. 1300-MAL: *Technical and Vocational Education and Industrial Training Study*, for \$468,000, approved on 17 May 1990.

² TA No. 2713-MAL: *Upgrading the Labor Market Information System*, for \$560,000, approved on 16 December 1996.

in general. In the light of the changes taking place in the TEST system, there is a need for a comprehensive strategic review of TEST, including (i) review of formal technical education, formal and nonformal skill training, and continuing education provided by public institutions under different ministries, private schools and institutions, and enterprises; (ii) review and redefinition of the respective roles of the private and public sectors and the responsibilities of different ministries and institutions; (iii) review of financing arrangements; and (iv) proposals for rationalization of TEST to meet emerging needs in the medium and longer term. The associated TA (see paras. 91-94) will provide for a strategic review of TEST, to serve as a basis for policy planning and formulation, including the preparation of the Eighth Malaysia Plan covering 2001-2005 and the Third Outline Perspective Plan covering 2001-2020.

52. In the context of its policy dialogue with the Bank, the Government will also implement the following measures under the Project:

- (i) continue to strengthen linkages between STSs and industry by establishing a school advisory committee comprising representatives from local industries, the community, and senior teachers; and a career guidance, industrial liaison, and placement unit in each new STS; and ensuring that these committees/units are established and operational in all schools to be upgraded;
- (ii) promote female participation in TVE programs by continuing to provide hostel facilities, strengthening information on TVE directed at female students, and promoting gender-neutral training and learning materials; and
- (iii) promote managerial efficiency and a demand-driven approach that is responsive to labor market needs by continuing to develop EMIS and BME.

IV. THE PROPOSED PROJECT

A. Rationale

53. Rapid economic growth; continuing expansion of employment; and continuing industrial expansion, restructuring, and upgrading have led to persistent shortages of both production workers with advanced industrial skills and engineers. Both are essential to increasing total factor productivity, which is a key objective of the 7MP. The quantitative and qualitative shortages of technical and engineering skills are a potentially serious constraint on the country's expansion into knowledge-based and high-technology industries, which is essential to sustain the competitive position of Malaysia's export industry. In recognition of the importance of further developing technical and engineering skills, TVE is indicated as an area of focus in the Bank's country operational strategy.

54. Increasing the technology intensity and efficiency of industrial production requires (i) production workers, technicians, and engineers to install, operate and maintain increasingly complex production facilities; and (ii) R&D engineers to further develop industrial capabilities. To meet these needs, under the 7MP the Government is strengthening technical education at the upper secondary, postsecondary, and tertiary levels. The STS system is one of the major stepping stones in the production of both technically qualified workers and entrants to higher technical programs at polytechnics and universities. The upgrading and expansion of the STS

system will improve the quality and increase the number of STS graduates going into further technical education and employment, and is a key element in the Government's strategy to address qualitative and quantitative skill shortages.

B. Objectives and Scope

55. The development objective of the Project is to improve the quality and expand the capacity of the technical education system in support of increasing the capital intensity and efficiency of production. The Project has three immediate objectives: (i) improving the quality of technical education, including management, curriculum, and delivery methodologies; (ii) strengthening staff development and teacher training; and (iii) expanding and upgrading facilities and equipment for technical education in general, and IT education in particular.

56. The Project will build on the support for the upgrading of the TVE system being provided under TVEP. In addition to supporting the construction of new STSs and upgrading of selected SVSs to STSs, TVEP is providing support in key aspects of the qualitative development of TVE, including developing the curriculum in engineering subjects, industrial liaison and career guidance, strengthening female participation in TVE, and strengthening BME. The implementation arrangements of the present Project (see paras. 68-83) are also closely in line with those under TVEP. The Project consists of three components, which are described briefly below and in more detail in Appendix 9.

1. Strengthening Technical Education Organization, Management and Delivery

57. The Project will support the effective planning and implementation of key changes in the TVE system, in particular the introduction of contextual learning, the piloting of "smart" STSs, related curriculum and learning materials development, staff training, and related capacity building and development of management information systems. The component is split into three subcomponents, which will be implemented through a coordinated program of international and domestic consulting services, R&D, external fellowships, and in-country training.

58. **Development of contextual learning and "smart" school programs.** The Project will support TED and the STS system in developing and implementing contextual learning, reviewing its initial implementation, and recommending adjustments and planning its further development. Support will be provided for TED and the MOE task force on "smart" schools for the initial implementation of the approach in four STSs, review and assessment of the initial experience gained, and the broader introduction of "smart" STSs.

59. **Curriculum and learning materials development.** The Project will support TED in (i) preparing a master plan and detailed implementation program for learning materials development, and (ii) developing a comprehensive set of core learning materials designed to meet the needs of a revised STS curriculum built around contextual learning and "smart" technology. The Project will also support MOE in reviewing the longer term future of vocational programs and the need to expand the technical electives offered under the MCE, based on the outcome of the strategic study on TEST (see paras. 91-94).

60. **Management development.** The Project will strengthen the capability of MOE and TED to manage STS programs. The use of EMIS and BME for policy making and program

management will be further developed. Provision is made for external training in human resource planning, and in civil works project management for staff of the Development, Privatisation and Supply Division (DPSD) in MOE and the Public Works Department (PWD), and for in-country training for about 160 planners in data analysis and the conduct of tracer studies. Provision is also made to strengthen the R&D activities of TED in support of program development.

2. Strengthening Staff Development

61. **Strengthening teacher training.** The Project will strengthen the capabilities of the Staff Development Division and network of STSs and polytechnics under TED to provide in-service staff and teacher training. External fellowships will be provided to train teacher trainers in technical and pedagogical aspects of contextual learning and "smart" school applications, teacher training, and testing and examination. Consultants will assist in teacher training planning and the development of short-term in-service training programs. Based on these activities, about 150 teacher trainers will be trained, and in-service seminars and workshops will be organized to upgrade pedagogical skills (750 teachers), curriculum and technical skills (870 teachers), and technical English (180 teachers).

62. **Strengthening management and staff training.** The Project will also strengthen management and staff training at the school level. It will focus on training to support the changes taking place in the STS system, in particular for financial and resource management, maintenance management, and "smart" technology management. Selected STS principals and senior assistants will receive external training in school management and will participate in planning and implementing in-country management training; a consultant will assist in the preparation of a school management training module; and 180 principals and senior assistants will receive management training. Training programs will be prepared for STS support staff, 170 trainers, and about 560 support staff. Periodic short-term training will also be provided to update about 300 principals' and teachers' familiarity with "smart" school technology.

3. Establishing and Upgrading STS Facilities and Equipment

63. **Establishing new STSs.** Four new STSs will be constructed and equipped. They will offer three technical engineering subjects and will pilot the "smart" STS concept. They will be located strategically in Peninsular Malaysia, including one in Sepang adjacent to the newly designated multimedia super corridor. The STSs will be built in accordance with new criteria established for "smart" STSs, with classrooms, laboratories, resource areas, administrative facilities, and hostels. They will be provided with furniture and equipment to "smart" STS specifications, together with relevant teaching and learning resource materials. Each new STS has a projected enrollment at Project completion of 1,200.

64. **Upgrading existing STSs.** The facilities and equipment of 17 recently redesignated STSs¹ will be upgraded to provide them with the physical facilities to accommodate technical electives. The STSs will be provided with some new construction; alterations to existing workspaces to accommodate the new laboratories, resource areas, and classrooms; and additional student hostel accommodation. New equipment necessary for the technical subjects will be provided together with teaching and learning materials. The 17 STSs

¹ Of 29 SVSs being upgraded under the 7MP, the remaining 12 will be upgraded with Government resources.

will increase their enrollment capacity from 11,616 students in 1996 to 24,260 students at Project completion. A list of schools and their current and projected enrollments is in Appendix 10.

C. Cost Estimates

65. The total cost of the Project is estimated at \$127.0 million equivalent (inclusive of taxes and duties) of which the foreign exchange cost is \$54.2 million (about 43 percent), including \$9.2 million for interest and other charges on the proposed Bank loan during construction; and local costs are \$72.8 million equivalent (about 57 percent). A summary of cost estimates of the Project is in Table 1, and more detailed cost estimates are in Appendix 11.

Table 1: Project Cost Summary
(\$'000)

Category	Foreign Exchange	Local Currency	Total Costs
A. Base Costs			
1. Strengthening Technical Education Organization, Management, and Delivery			
a. Contextual learning and "smart" programs	1,039	254	1,293
b. Curriculum and learning materials development	1,300	293	1,592
c. Management development	473	135	607
2. Strengthening Staff Development			
a. Teacher training	221	1,166	1,387
b. Management and staff training	55	1,062	1,117
3. Establishing and Upgrading STS Facilities and Equipment			
a. Establishing new STSs	21,664	34,272	55,936
b. Upgrading existing STSs	15,248	27,040	42,288
Total Base Costs	40,000	64,221	104,220
B. Contingencies			
1. Physical Contingencies	2,690	3,967	6,657
2. Price Escalation	2,286	4,632	6,918
Total Contingencies	4,977	8,599	13,575
C. Interest and Other Charges	9,195	0	9,195
Total Project Cost	54,171	72,820	126,990
Percent	43	57	100

Note: Some figures do not tally because of rounding.

D. Financing Plan

66. It is proposed that the Bank provide a loan of \$40.0 million to finance the foreign exchange base costs of the Project. The Government will finance the remainder of the cost of the Project of \$87.0 million equivalent. The Government will finance part of the foreign exchange costs including contingency allowances and interest and other charges during construction as well as the entire local currency costs of the Project. The proposed loan will have an amortization period of 20 years including a grace period of 5 years, with an interest rate determined in accordance with the Bank's pool-based variable lending rate system for US dollar loans and a commitment charge of 0.75 percent per annum. The financing arrangements are summarized in Table 2 and shown in more detail in Appendix 12.

Table 3: Proposed Financing Plan
(\$ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Bank	40.0	0	40.0	31
Government	14.2	72.8	87.0	69
Total	54.2	72.8	127.0	100

67. An analysis of the impact of the Project on the forecast Government education budget indicates that the development funds for the Project for each year of the Project, expressed as a proportion of MOE's projected development budget, will not exceed 2.7 percent. Average annual incremental operating costs are estimated to be about \$4.2 million during the implementation period of the Project. In 2002, when all the institutions covered by the Project are operational, the additional annual operation and maintenance costs (O&M) are estimated to be equivalent to 0.3 percent of the projected MOE operating budget for that year.

E. Implementation Arrangements

1. Executing Agency

68. The Executing Agency for the Project will be MOE, which has considerable experience in implementing education projects financed by the Government and by external agencies, including the Bank.

2. Project Implementation Unit

69. DPSD within MOE has sole responsibility for the implementation of all MOE development projects funded by either the Government or external agencies. DPSD is also responsible for land acquisition and procurement of recurrent and capital goods and services for all MOE divisions. The Project Implementation Unit (PIU) within DPSD has implemented three Bank-funded projects, is currently implementing TVEP, and will be responsible for implementation of the Project using existing staff and organizational arrangements. The PIU has

a full-time staff of 15 qualified personnel and receives significant support from technical staff seconded from PWD and the Supply Unit of the DPSD. A Principal Assistant Secretary will be designated as the Project Director and head of the PIU under the overall guidance of the Secretary of DPSD. An Assistant Secretary will be designated as Project Manager with responsibility for the day-to-day implementation of the Project under the supervision of the Project Director. This arrangement has worked effectively in the implementation of previous Bank-funded projects and allows the full range of DPSD's resources to be used by the PIU as required.

3. Project Coordination Committee

70. The Project Coordination Committee that is coordinating TVEP will be responsible for the Project. It will provide policy guidance and coordinate all implementation activities. Its membership will comprise the Secretary General of MOE, or a representative, as Chairman; the Secretary of DPSD; the Project Director (as Member Secretary); the Project Manager; and representatives of TED, the Federal Treasury, the Economic Planning Unit (EPU), the Educational Planning and Research Division (EPRD) as well as such other representatives as may be required for the effective coordination and implementation of the Project. The Committee meets at intervals of no more than six months.

4. Implementation Schedule

71. The Project will be implemented over five years. The implementation schedule, showing the timing of major actions by programs and components, is in Appendix 13.

5. Procurement of Goods and Services

a. Consulting Services

72. PWD will be responsible for the preparation of designs, site plans, specifications, cost estimates, and tender documents; evaluation of bids; award of contracts; and contract supervision relating to civil works for the upgrading of 17 schools under the Project. For the four new STSs, DPSD will be responsible for the design and supervision of the civil works and for recruiting local architectural and engineering consulting firms that have been approved by and registered with the Government to carry out the works. Recruitment will be in accordance with the Government's standard procedures acceptable to the Bank.

73. The Project will require a total of 332 person-months of consulting services, including 96 person-months of international and 236 person-months of domestic services. The internationally recruited consultants (including qualified Malaysian consultants) to be financed under the loan will be engaged in accordance with the Bank's *Guidelines on the Use of Consultants*. Domestic consultants, with qualifications and experience satisfactory to the Bank, will be financed by the Government and engaged in accordance with Government standard procedures acceptable to the Bank. The full terms of reference of the consultants will be by agreement between the Government and the Bank. The list of consultants and outline terms of reference are in Appendix 14.

b. Research and Development Program

74. The Project will provide for R&D to support TED's program development. Activities under this input will include research workshops to train educators to conduct research, workshops to introduce action research to STS and polytechnic practitioners, R&D of new educational products, dissemination of current research findings, and independent research on distance education and new areas of potential demand for technical education. Contracts under this input component are expected to be below \$50,000 each and will be awarded in accordance with Government standard procedures acceptable to the Bank. The tentative areas for R&D are in Appendix 15.

c. Staff Development Programs

75. The Project will provide external and domestic fellowships for selected teachers, teacher trainers, administrators, and technical staff to undertake study programs related to contextual learning, "smart" school development, new vocational subjects, curriculum development, TVE and human resources planning, and civil works project management. A close link is envisaged between external and internal training. The former will be used to train trainers, principals, and senior teachers to conduct in-country training. The program of external fellowships to be provided under the Project and the criteria for the selection of the recipients will be finalized and agreed to by the Government and the Bank prior to the commencement of the program. The recipients of fellowships will be obliged to remain in service for an appropriate period of time after their training in accordance with the Government's existing regulations. A tentative list of external and in-country staff development programs is in Appendix 16.

d. Equipment, Furniture, and Instructional Materials

76. All procurement of equipment, furniture, and instructional and consumable materials to be funded from the proceeds of the Bank loan will be in accordance with the Bank's *Guidelines for Procurement*. Procurement will follow international competitive bidding, international shopping, or other procedures as appropriate. Procurement details are in Appendix 17, including a tentative list of equipment, furniture, and instructional materials.

e. Land Acquisition

77. The Government has given assurances that the selected sites that satisfy the established criteria for the construction of educational institutions, rights in land, and rights-of-way required for the Project will be acquired in a timely manner for the four new schools.¹ The upgrading of 17 SVSs will not require additional land, because the existing campuses can accommodate the planned expansion.

¹ At appraisal, land acquisition was complete for three of the selected sites and was in progress for the fourth, at Sepang in the State of Selangor, for which no resettlement issues were noted. If necessary, the resettlement policies and practices of the State of Selangor will be applied. These have been reviewed and found acceptable by the Bank and were applied in Loan No. 1500-MAL:Klang River Basin Environmental Improvement and Flood Mitigation Project, for \$26.3 million, approved on 5 December 1996.

f. Civil Works

78. The civil works contracts for the four new STSs will be awarded on the basis of international competitive bidding, in accordance with the Bank's *Guidelines for Procurement*. Based on past experience under Bank-financed projects, civil works contracts with a value below \$5.0 million are unlikely to attract foreign construction firms. Since the civil works for the upgrading of 17 existing schools are estimated at substantially below \$5.0 million each and are dispersed throughout the country, it is proposed that the contracts for such works will be awarded following local competitive bidding among prequalified contractors. MOE will ensure that approved standard modular designs that have been developed for schools built under the previous three vocational education projects and TVEP are used wherever appropriate.

6. Advance Action

79. In view of the advanced status of the Government's plans to upgrade and expand the SVS/STS system, in preparation for Project implementation MOE will undertake advance action, in particular related to the preparation of equipment procurement and tender documents for civil works. All advance action will be in accordance with the Bank's *Guidelines on the Use of Consultants* and *Guidelines for Procurement*. The Government was advised that the approval of advance action does not commit the Bank to finance the Project.

7. Midterm Review

80. A midterm review of all aspects of the Project will be carried out by the Government and the Bank in the middle of the third year. This will include an assessment of the progress made in relation to the targets set and a review of progress made and problems encountered in the upgrading of SVSs to STSs. Based on the findings of the review, necessary changes to the Project will be considered by the Government and the Bank.

8. Benefit Monitoring and Evaluation

81. MOE is developing EMIS, based in EPRD, with support from the World Bank. When it is fully operational, EMIS will link all parts of MOE, state and district education offices, and major schools. Following an initially slow start, significant progress has been made in the past year and the basic network of the system is now functioning. Pending the establishment of EMIS, delays were also encountered in establishing management information systems and BME for TVE. The framework for BME has been established, preparatory work is under way, and initial tracer studies are being undertaken. Under TVEP there are a total of 12 person-months of international and 36 person-months of domestic consulting services allocated for the development of the BME systems for TVE, including the establishment of baseline indicators, the conduct of tracer studies and surveys, and the development of computerized data systems. The consultancies will be implemented in 1998, and the system is expected to be fully operational by the end of 1999.

82. The proposed Project will build on the BME activities being established under TVEP, principally through the conduct of reverse tracer studies, the provision of consultants and fellowships to improve the interface between the TVE BME and EMIS, and staff training programs to develop the ability of end-users to analyze and use BME data for management purposes. The

BME committee established under TVEP will continue to oversee BME activities and the integration of BME into EMIS. A framework for BME is in Appendix 18.

9. Operation and Maintenance

83. The Government will operate the educational institutions and facilities included in the Project in accordance with sound administrative and educational practices and with due regard for economy and efficiency. The Government will provide promptly and as needed the staff, funds, facilities, services, and other resources to maintain adequately the buildings, furniture, and equipment of the Project facilities, and will make necessary repairs and renewals.

F. Environmental and Social Measures

1. Environment

84. Environmental implications were reviewed, and no significant adverse environmental impacts were identified. Government regulations require an environmental review as an integral part of all site appraisals for infrastructure development in the country. The site appraisals for the four new STSs did not reveal any significant adverse environmental impacts. Environmental considerations were reviewed carefully during site selection and design planning for the four new STSs. All four sites are adjacent to industrial areas, to facilitate close cooperation with industry, and have adequate roads, utilities, and communication services. Appropriate educational, residential, and recreational facilities will be established for each STS, including due provision for services, drainage, and landscaping. The 17 SVS/STSs to be upgraded are on established sites and will require only relatively minor additional structures, which will be added to existing buildings in ways that will cause minimum disruption to current building heights or lines. Much of the upgrading will be undertaken by internal restructuring.

85. MOE is well aware of the need to follow existing guidelines on the incorporation of environmental issues into the TVE curriculum followed by STSs. The work of the consultant on environmental education and occupational safety and health being provided under TVEP will be taken into consideration by the Project. It is also envisaged that the practical modalities of contextual learning being introduced under the Project will help students to understand environmental issues.

2. Social Issues

86. An initial social assessment was carried out in January 1997 in connection with fact-finding for the project preparatory TA. The assessment identified two key social issues to be considered during Project preparation: the need to ensure equitable access to TVE for students from across the country, including remote areas and low-income families; and the need to further strengthen female participation in TVE. Both issues were reviewed under the TA to ensure that appropriate policies are in place and appropriate measures are included in the Project.

87. Established Government policies include measures to improve the access of students from poor families and remote areas to TVE through the provision of free tuition for all students and subsidized accommodation, food, and health care for students who are not living at home. Parents are encouraged to apply for the STS of their choice anywhere in the country, stating a second choice where applicable. Each STS has student enrollments from several

states. Students living in hostel accommodation are charged RM1.00 (approximately \$0.35) per day for meals, with the Government subsidizing the estimated balance of RM2.90 (approximately \$1.02). In 1996, the estimated food subsidy for the STS system was approximately RM16.1 million (\$5.7 million).

88. The Government recognizes the importance of the role of women in the country's economic and social development. In the context of current labor shortages, the 7MP places particular emphasis on increasing female labor force participation. In 1996, women constituted 33.7 percent of the total employed. The female labor force participation rate¹ had risen to approximately 47.1 percent in 1996 and is expected to be 47.5 percent by 2000. Between 1990 and 1996, the proportion of the female labor force employed in manufacturing declined somewhat (from 46.4 to 43.4 percent), while the corresponding proportion increased significantly for services (from 25.9 to 38.7 percent) and construction (from 6.9 to 12.4 percent).

89. Female participation in TVE increased significantly in the 1970s and 1980s, leveled out in absolute terms in the early 1990s, and was 26-27 percent in 1994-1996. Female enrollment is higher in the technical stream (32 percent) than in the vocational (26 percent) or skill (12 percent) streams. It is much higher in commerce (77.6 percent of all commerce students) than in engineering (25.3 percent of all engineering students) subjects, although female enrollment in engineering has increased considerably in absolute terms in the 1990s. The higher popularity of the technical stream among female students may be associated with the more academic nature of the programs. It may also be explained by the high percentage of women teachers in STSs (65 percent) compared with SVS/STSs (35 percent). The recent leveling out of female enrollment in TVE programs may be related to the rapid expansion in the 1990s of job opportunities for women in the services sector, which are often accessible with a general education background. Female participation in TVE and employment is described in Appendix 5.

90. The Project will continue to support measures to promote female participation in TVE. The new and upgraded STSs will be provided with dormitory facilities for female and male students. Curriculum and learning materials developed under the Project will pay attention to gender neutrality and use examples and illustrations appropriate for both female and male students. TVEP includes a consultant to review and propose ways of promoting female participation in TVE. Working with the Women's Affairs Division of the Ministry of National Unity and Social Development, the consultant will assist TED to develop strategies for disseminating information on TVE in lower secondary schools, design publicity campaigns through the media, and conduct seminars on promoting female participation in TVE. The Project will benefit from and build on these activities.

G. Technical Assistance

91. TA for Strategic Review of Technical Education and Skill Training is proposed to be approved together with the Project. The objective of the TA is to assist EPU in undertaking a strategic review of TEST as a basis for policy review and planning, including the preparation of the Eighth Malaysia Plan (2001-2005) and the Third Outline Perspective Plan (2001-2020). Specifically, the TA will (i) map out existing roles and responsibilities in the provision of TEST; (ii) review key TEST issues, roles, and responsibilities in the light of economic, technological, and

¹ The proportion of the total female working-age population, in the age group 15-64 years, in salaried employment.

industrial developments; rapidly changing labor market demand; and changes in relevant Government policies; and (iii) prepare issues papers and a draft report reviewing options for future strategies for discussion at a national workshop for key parties involved in TEST. Based on the workshop discussions, the TA will finalize the strategic review report, providing background analysis and a balanced review of strategic options for the rationalization and further development of TEST as an input to Government planning.

92. EPU will serve as the Executing Agency for the TA. EPU will be assisted by a team of international and domestic consultants engaged by an international consulting firm with extensive experience in TEST policy and planning, to be selected by the Bank in accordance with its *Guidelines on the Use of Consultants*. The simplified technical proposal procedure will be used in the selection of consultants. Shortlisted firms will be requested to submit proposals that include domestic consultants. However, the domestic consultants will be paid directly by the Government under a separate contract to be negotiated between them and the Government. The Government reserves the right to engage other domestic consultants, acceptable to the Bank and the selected international consulting firm, if a satisfactory agreement cannot be reached with the domestic consultants initially included in the proposal submitted by the international consulting firm. The domestic consultants will be supervised by the international team.

93. About 15 person-months of international and 20 person-months of domestic consulting services will be needed to carry out TA activities. The consulting services should include expertise in (i) TEST organization and policy (8 person-months, international); (ii) TEST financing (4, international); (iii) private sector and enterprise-based TEST (3, international); and (iv) research, surveys, and data gathering on TEST (two domestic consultants for 10 person-months each). The TA will emphasize close cooperation among international consultants, domestic consultants, and counterpart staff in EPU. The TA will finance the cost of the international consultants.

94. The total cost of the TA is estimated to be \$824,000 equivalent, of which \$466,000 is the foreign exchange cost and \$358,000 equivalent is the local currency cost. The Bank will provide \$500,000 equivalent covering the entire foreign exchange cost and \$34,000 equivalent in local currency costs. The TA will be financed by the Bank on a grant basis from the Japan Special Fund, funded by the Government of Japan. It is proposed that the Government of Malaysia meet the remaining cost of \$324,000 equivalent, which represents expenditures (in cash or in kind) for domestic consultants, remuneration of counterpart staff, one national workshop, administrative support, and office space. The terms of reference and detailed cost estimates for the TA are in Appendix 19.

V. PROJECT JUSTIFICATION

A. Financial and Socioeconomic Analysis

1. Project Benefits

95. The Project will improve the quality and increase the graduate output of the upper secondary STS system, thus contributing to strengthening the capacity of the TVE system at subsequent levels (postsecondary and tertiary). An estimated 60 percent of STS graduates feed into further education, mainly in polytechnics and universities, and are a principal source of technical diploma and degree level graduates in technical subjects. SVS/STS graduates are also

a major source of skilled production workers. By strengthening upper secondary technical education, the Project will strengthen the capacity of the overall TVE system to address critical shortages of engineers and production workers with advanced technical skills.

96. The enrollment capacity of the STS system in 1996 was about 48,000, with an annual graduate output of about 22,600. By 2002, with the support of TVEP and the proposed Project, the STS system is expected to have an enrollment capacity of about 92,600 and an annual output of about 43,700 graduates. The Project will expand the enrollment capacity of the STS system by about 17,440 student places, and annual graduate output by about 8,200. At Project completion, the four new STSs will have a total of 4,800 new student places, and the total enrollment capacity of the 17 upgraded STSs will have increased from 11,616 in 1996 to 24,260. Compared with the baseline capacity of the STS system in 1996, the Project will increase total capacity and graduate output by 36 percent. The expansion of the STS system will contribute significantly to meeting the demand for skilled production workers and, indirectly, engineers, by better preparing secondary graduates for entry into polytechnic and university-level engineering programs. However, given that estimated annual demand during the 7MP period is for 100,000 additional production workers and 56,000 professional workers, a continued shortfall between labor market demand and the output of the TVE system can be expected.

97. In addition to increasing the output of the STS system, the Project will raise the quality of graduates from both vocational and technical streams. The new contextual approach will facilitate learning in particular of mathematics and science subjects. Increased provision of computers for both core subjects and technical/vocational electives will raise overall standards of computer literacy. The introduction of "smart" school technology will expose students to up-to-date IT of direct relevance to the workplace and further technical studies. The new teaching and learning methodologies will improve students' comprehension of and ability to apply knowledge and skills. The Project is expected to help improve internal efficiency as reflected in academic performance. Grades and pass rates attained by students at the MCE and MCE(V) are expected to improve. In 1996, the overall MCE pass rate in the nine existing STSs was 98 percent, and 60 percent of students obtained a first grade pass. In the SVSs being upgraded to STSs, only 21 percent of students obtained a first grade pass at the MCE(V).

98. The Project will improve the quality of teachers and teaching in the STS system, and will ensure that teachers' knowledge and skills keep pace with educational and technological developments and the needs of industry and commerce. At Project completion, teacher trainers will have been trained in pedagogical aspects of contextual learning and "smart" school applications as well as recent technical developments, in-service training programs will be further developed, and about 1,800 teachers will have received pedagogical and technical upgrading.

99. The Project will strengthen the management of the STS system in TED and at the school level, thus enhancing the efficient use of resources. The upgrading of 69 SVSs to STSs, including the introduction of the technical stream in SVS/STSs that previously offered only vocational courses; the introduction of contextual learning; and the piloting of "smart" school technology entail major changes in management at the school level. The Project will introduce new management training programs for STS principals, senior assistants, and support staff designed to address the new and changing aspects of their work. Maintenance management of advanced IT equipment will be given particular prominence. Training will also be provided to MOE and STS staff to improve the analytical use of EMIS and BME data.

100. The Project is expected to improve the external efficiency of the STS system, measured in terms of graduate placement in further technical education (mainly polytechnics and universities) and employment. Graduates proceeding to further education are ultimately expected to become production or R&D engineers, thus contributing to developing the qualitative capacity of industry. Graduates entering employment are expected to take up jobs requiring advanced technical skills. By improving the quality and strengthening the flow of engineers and skilled workers, the Project will ultimately benefit industry and commerce, both in areas near the locations of the new and upgraded STSs and throughout the country.

101. The immediate beneficiaries of the Project will be the 29,060 students enrolled in the four new and 17 upgraded STSs at Project completion. The beneficiaries also include approximately 1,800 teachers who will receive in-service training; 180 STS principals and senior assistants who will receive management training; about 320 teacher trainers; about 560 school technicians, laboratory assistants, and other support staff; and about 460 educational planners and other staff to be trained in external and domestic programs. By supporting qualitative improvements in the curriculum, teaching/learning methods, and instructional and teaching materials more broadly, the Project will also benefit all students enrolled in TVE courses, estimated to total 92,640 at Project completion.

2. Financial Sustainability

102. The Project is expected to improve the cost effectiveness of the STS system by reducing unit costs and by strengthening the management of the STS system at the Central and school levels. In 1996-1997 unit costs (annual operational costs per enrolled student) were about 12 percent lower for students enrolled in the technical than in the vocational stream.¹ The difference is due mainly to the fact that costs for consumables and the O&M of equipment are generally lower for technical than for vocational subjects.

103. The Project will increase the total enrollment and annual graduate output capacity of the Project schools, including the four new schools, by about 150 percent. At Project completion in 2002, O&M costs for the Project schools will have increased by about 127 percent, and are estimated to be about 0.3 percent of the projected MOE budget for that year. These estimates reflect a reduction in unit costs of about 9 percent, achieved by expanding technical enrollments, but do not take into consideration further reductions expected to result from improved administrative and managerial efficiency. As the proportion of technical students enrolled in the STS system increases, further reductions in unit costs can be expected in the medium and longer term.

3. Project Risks

104. MOE and the PIU have the technical and administrative experience necessary to implement the Project. The PIU has implemented three Bank-financed vocational education projects, is currently implementing TVEP, and is fully familiar with Bank policies and procedures for project implementation. The Government has consistently demonstrated the high priority it accords to the development of the STS system through the timely and adequate provision of local funds for these projects. The advanced status of Government plans to upgrade the STS

¹ Annual operational costs in 1996-1997 for a technical student were about RM3,405 (\$1,362) compared with RM3,883 (\$1,553) for a vocational student.

system under the 7MP was recognized at the start of Project processing and has been taken into careful consideration by the Bank and the Government in planning the civil works and equipment inputs, to minimize the risk of implementation delays. No significant risks are foreseen in the implementation arrangements.

105. Because Malaysia has virtually full employment and a shortage of skilled and professional labor in the sectors to be addressed by the Project, there is little risk that the graduates of schools included in it will be unable to find relevant employment. The smooth functioning of the labor market will also be supported by the Bank-funded TA to upgrade labor market information (see para. 49). The 7MP envisages an eventual shift of the institutional responsibility for vocational education and skill programs currently under the STS system to other Government agencies. The proposed changes will require careful analysis and review to ensure that full account is taken of the TEST system more broadly, and of the inputs and support being provided to the STS system under TVEP and the Project. The issue is being addressed through policy dialogue (see paras. 49-52) and the provision of TA for strategic review of TEST (see paras. 91-94).

B. Social Dimensions

106. The Project will promote equitable access to TVE for students from across the country, including those from remote rural areas and low-income families, through the continued Government provision of free tuition, hostel accommodation for those who are unable to register as day students, and food and health care subsidies. The Project will support female participation in TVE by further expanding hostel accommodation, for both the new and upgraded schools. The Project will support the development of curriculum and training materials using nongender-specific examples and illustrations. Given that female enrollments have been higher in the technical than in the vocational stream, it is also expected that the upgrading of SVSs to STSs will in itself encourage increased participation of female students.

VI. ASSURANCES

107. The Government has given the following assurances, in addition to the standard assurances, which have been incorporated in the legal documents:

- (i) The Government will ensure timely and regular release of adequate budgetary allocations for all counterpart funds required for Project implementation, including provision for such amounts of foreign exchange as may be required for payment of interest and other charges during construction of Project facilities, contingency allowances and related expenditure.
- (ii) Guidelines will be issued and procedures established for the leasing of computer equipment, and all computer equipment required in the new "smart" STSs being established under the Project will be leased by the Government in a timely manner.
- (iii) To strengthen institution-industry linkages, MOE will, within one year after the loan effectiveness date, establish school advisory committees and career guidance, industrial liaison, and placement units in those of the 17 schools to be upgraded that do not already have such committees and units; will establish such

committees and units in the four new schools within one year of commencement of classes; and will ensure that these units are fully operational.

- (iv) MOE will continue to develop EMIS as a framework for the BME system for TVE being established under TVEP and to be further developed under the Project.
- (v) The Bank will be kept fully informed of any decisions related to the future of the vocational programs and skill programs currently being offered by SVS/STSs.
- (vi) All land, and rights in land, required for the sites selected for the four new STSs will be promptly acquired or otherwise made available to ensure timely Project implementation.
- (vii) MOE will ensure that, in connection with civil works to be completed under the Project, approved standard and modular designs (developed under previous vocational education projects and TVEP) are used wherever appropriate.
- (viii) MOE and the Bank will agree on the types and timing of external fellowships, and MOE will select all candidates for such fellowships in accordance with procedures satisfactory to the Bank.
- (ix) The recipients of external fellowships under staff development programs will be required to continue their service with MOE for an appropriate period after such training in a capacity relevant to the training provided.
- (x) The Government is reviewing and finalizing its "smart" STS specifications and will keep the Bank informed of any changes.

VII. RECOMMENDATION

108. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Bank and recommend that the Board approve the loan of \$40.0 million to Malaysia for the Technical Education Project from the Bank's ordinary capital resources, with interest to be determined in accordance with the Bank's pool-based variable lending rate system for US dollar loans and with an amortization period of 20 years, including a grace period of 5 years, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board.

MITSUO SATO
President

21 November 1997

APPENDIXES

Number	Title	Page	Cited on (page,para.)
1	Project Framework	29	2,4
2	Organizational Structure of the Ministry of Education	31	2,5
3	Enrollment in SVS and STS Courses	32	3,12
4	Participation of Women in TVE and Employment	33	3,12
5	Trends in Education Expenditure	35	4,15
6	Employment by Major Occupational Group and Sector 1990-2000	36	5,18
7	External Assistance to the Education Sector	37	10,42
8	Implementation Status of the Technical and Vocational Education Project	38	11,46
9	Project Components	40	14,56
10	Project Institutions, Fields of Study, and Enrollments	43	15,64
11	Project Cost Estimates	45	16,65
12	Proposed Financing Plan	46	17,66
13	Project Implementation Schedule	47	18,71
14	Outline Terms of Reference for Consultants	48	18,73
15	Research and Development Program	54	19,74
16	Staff Development Program	55	19,75
17	Procurement Arrangements	60	19,76
18	Framework for Benefit Monitoring and Evaluation	62	21,82
19	Technical Assistance for Strategic Review of Technical Education and Skill Training	64	23,94

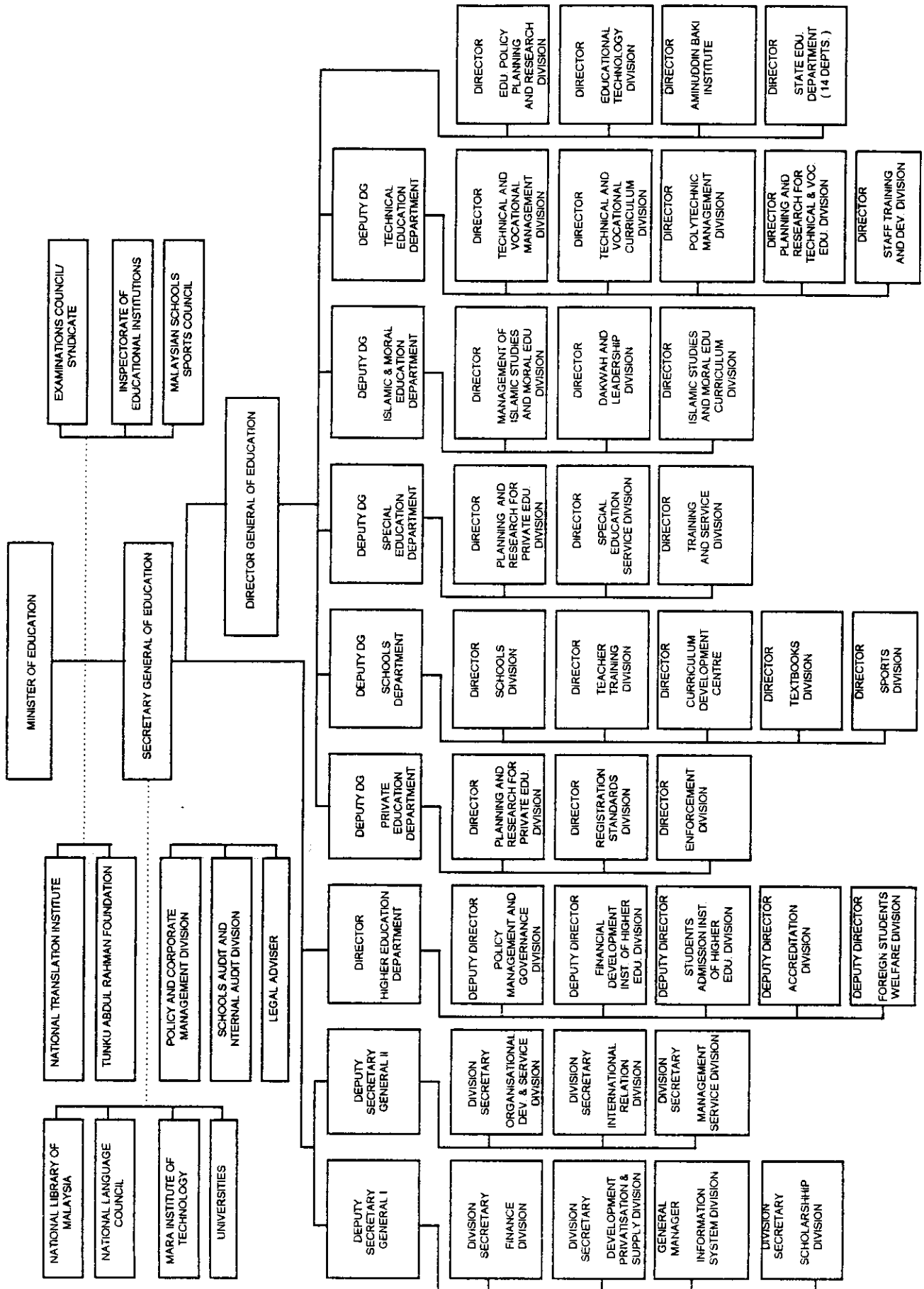
PROJECT FRAMEWORK

Design Summary	Targets/Outputs	Means of Verification	Important Assumptions
1. Development Objective To improve the quality and expand the capacity of the technical education (TE) system in support of increasing the capital intensity of production	1.1. Improved placement of graduates in further TE and the labor market 1.2. Improved employer satisfaction with performance of TE system graduates 1.3. Expanded enrollment capacity of TE system	1.1. MOE and TED reports, and tracer studies	– Employment and demand for skilled labor remain high. – EMIS is further developed.
2. Immediate Objectives 2.1. To improve the quality of TE, including management, curriculum, and delivery methodologies 2.2. To strengthen staff development and teacher training 2.3. To expand and upgrade facilities and equipment for TE in general and information technology (IT) education in particular	2.1.1. Modified TE curriculum being introduced in STSs 2.1.2. TE management systems strengthened 2.2.1. Management training for STS principals strengthened 2.2.2. Teacher training strengthened, and 1,800 key teachers and 1,520 other staff trained 2.3.1. Four new STSs built and equipped 2.3.2. 17 SVSs upgraded into STSs and equipped 2.3.3. Four new STSs provided with advanced IT equipment as pilot "smart" schools	2.1.–2.3. PIU, MOE, and TED reports	– MOE continues to implement curriculum and teaching methodology reform. – Policies for retention and training of TE system staff and teachers are maintained. – EMIS is further developed.
3. Project Components 3.1. Strengthening TE management, organization, and delivery 3.2. Strengthening staff development 3.3. Establishing and upgrading STS facilities and equipment	3.1.1. Studies prepared, reviewed, and used as inputs in revising the TE curriculum and teaching methodology 3.1.2. Learning materials for "smart" STSs developed 3.1.3. Information systems for BME further developed 3.2.1. Teacher training programs for contextual learning and "smart" schools developed 3.2.2. Training programs for headmasters and administrative staff developed 3.2.3. 1,800 teachers and 1,520 other staff trained in in-country training programs 3.2.4. 70 planners and teachers trained on external training programs 3.3.1. Four new STSs established and fully operational 3.3.2. 17 existing SVSs upgraded to STSs and fully operational 3.3.3. Four STSs provided with "smart" school IT equipment	3.1.–3.4. PIU, MOE, TED, and principals' reports	– MOE continues to implement curriculum and teaching methodology reform. – Institutional responsibilities for teacher training are clarified.

Design Summary	Inputs/Activities	Means of Verification	Important Assumptions
4. Project Components			
4.1. Strengthening TE management, organization, and delivery	4.1.1. International consultants 4.1.2. Domestic consultants 4.1.3. Learning materials development 4.1.4. Research and studies	4.1. – 4.3. PIU, MOE, and TED reports	– Appropriate consultants are identified, in particular, for learning materials development and BME.
4.2. Strengthening staff development	4.2.1. Training programs development 4.2.2. In-country training programs 4.2.3. External training programs		– Policies for retention and training of TE system staff and teachers are maintained .
4.3. Establishing and upgrading STS facilities and equipment	4.3.1. Civil works for 4 new STSs and upgrading of 17 SVSs 4.3.2. Equipment procurement		– PIU uses established designs for facilities and applies established Government and Bank procedures.

BMIS – Benefit Monitoring and Evaluation
 EMIS – Educational Management Information System
 IT – Information Technology
 MOE – Ministry of Education
 PIU – Project Implementation Unit
 STS – Secondary Technical School
 SVS – Secondary Vocational School
 TE – Technical Education
 TED – Technical Education Department

ORGANIZATIONAL STRUCTURE OF THE MINISTRY OF EDUCATION



ENROLLMENT IN SVS AND STS COURSES

Course	1990	1991	1992	1993	1994	1995	1996 ^a
SVS							
Engineering Trades	18,138	19,146	20,112	16,368	22,332	23,620	20,843
Home Economics	1,831	2,072	2,258	1,961	2,477	2,632	2,734
Commerce	3,818	3,972	4,359	3,639	4,483	4,486	4,580
Agriculture	724	795	775	604	768	756	740
Total MCE(V) ^b	24,511	25,985	27,504	22,572	30,060	31,494	28,897
Skill Courses ^c	546	516	458	13,630	11,747	10,686	8,752
Total SVS	25,057	26,501	27,962	36,202	41,807	42,180	37,649
STS							
Mechanical Engineering					617	1,372	2,866
Civil Engineering					645	1,341	2,807
Electrical Engineering					695	1,419	3,092
Technical Studies	3,836	3,772	3,600	3,643	1,872		
Commerce	1,025	1,083	1,044	1,060	1,115	1,172	1,177
Agriculture	426	410	355	357	300	275	338
Others	597	475	435	411	455	303	144
Total STS	5,884	5,740	5,434	5,471	5,699	5,882	10,424
Grand Total	30,941	32,241	33,396	41,673	47,506	48,062	48,073

^a Due to the upgrading of some SVSs in 1996, there is a reduction in SVS enrollments and an increase in STS enrollments.

^b Figures for 1990–1992 include skill courses.

^c Figures for 1990–1992 reflect only short courses; those for 1993–1996 include both skill and short courses.

Source: MOE.

PARTICIPATION OF WOMEN IN TVE AND EMPLOYMENT

1. Female participation in TVE increased steadily in the 1970s and 1980s, as reflected in enrollments and the proportion of female teachers employed in SVSs and STSs. In the early 1990s, female participation continued to increase in real terms but levelled out proportionately. Trends in female enrollments in TVE and the proportion of female teachers in TVE are in Tables 1-3.

Table 1: Female Enrollment in TVE (percent of total)

Type	1970	1980	1990	1991	1992	1993	1994	1995	1996
SVS	16.3	30.4	23.1	23.6	25.5	25.1	24.0	24.1	25.5
STS	4.3	27.1	36.1	37.2	38.4	40.2	39.0	39.5	32.2

Source: MOE.

Table 2: Female Enrollment in TVE

Type	1990	1991	1992	1993	1994	1995	1996
SVS	5,777	6,260	7,122	9,076	10,054	10,184	9,614
STS	2,125	2,135	2,089	2,199	2,223	2,324	3,352
Total	7,902	8,395	9,211	11,275	12,277	12,508	12,966

Source: MOE.

Table 3: Female Teachers in TVE (percent of total)

Type	1990	1991	1992	1993	1994	1995	1996
SVS	35.0	35.0	35.0	35.0	35.0	35.0	35.0
STS	65.1	65.1	64.6	65.1	65.0	65.0	65.1
Total	39.5	39.6	38.8	38.8	38.6	37.8	37.7

Source: MOE.

2. Female participation as a proportion of total enrollment is higher in the technical stream than in the vocational stream, while a very small proportion participated in skill courses. Female students account for a high proportion of commerce and home economics enrollments, and a relatively low proportion of engineering courses. While female participation in engineering subjects has been low, it has increased significantly in absolute terms. In 1993, only 922 women in STSs (42 percent of female enrollment) were enrolled on engineering courses; in 1996, the corresponding figure was 2,095 (63 percent of female enrollment). Female participation in different STS, SVS, and skill courses is given in Table 4.

Table 4: Female Enrollment in TVE Courses (percent of total)

Course	1990	1991	1992	1993	1994	1995	1996
STS courses							
Engineering Courses	23.6	22.6	24.4	25.3	26.3	25.4	23.9
Commerce	71.4	73.5	72.9	77.6	72.5	77.9	77.6
Agriculture	55.9	62.4	65.6	59.4	62.7	70.2	72.2
Others	41.7	48.2	49.9	58.9	48.6	55.8	69.4
Total STS	36.1	37.2	38.4	40.2	39.0	39.5	32.2
SVS Courses							
Engineering Trades	n.a.	n.a.	n.a.	6.2	7.9	8.9	9.2
Home Economics	n.a.	n.a.	n.a.	92.6	92.1	90.9	89.9
Commerce	n.a.	n.a.	n.a.	76.0	82.4	83.1	83.8
Agriculture	n.a.	n.a.	n.a.	34.4	44.0	49.3	44.7
Skill Courses	n.a.	n.a.	n.a.	24.0	16.9	14.9	12.2
Total SVS	23.1	23.6	25.5	25.1	24.0	24.1	25.5
Total TVE	25.5	26.0	27.6	26.9	25.8	26.0	27.0

Source: MOE.

3. Between 1990 and 1995, the proportion of women of the total employed increased from 31.4 to 33.7 percent. The female labor force participation rate¹ was 47.1 percent in 1996 and is expected to be 47.5 percent by 2000. Between 1990 and 1995, the proportion of the female labor force employed in manufacturing declined somewhat (from 46.4 to 43.4 percent), while the corresponding proportion increased significantly for services (from 25.9 to 38.7 percent) and construction (from 6.9 to 12.4 percent). Women's employment by industry is given in Table 5.

Table 5: Women's Employment by Industry (percent of total)

Industry	1990	1995
Agriculture, Forestry, Livestock, and Fishing	34.4	28.4
Mining and Quarrying	12.9	11.9
Manufacturing	46.4	43.4
Construction	6.9	12.4
Electricity, Gas, and Water	4.3	7.8
Transport, Storage, and Communication	36.6	11.2
Wholesale and Retail Trade, Hotel, and Restaurants	11.1	37.6
Finance, Insurance, Real Estate, and Business Services	34.2	40.3
Other Services	37.9	39.2
Total	31.4	33.7

Source: Seventh Malaysia Plan.

¹ The proportion of the total female working age population, in the age group 15-64 years, in salaried employment.

TRENDS IN EDUCATION EXPENDITURE (RM million)

GNP and Expenditure	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
1. GNP	74,679	85,777	95,560	110,637	122,581	138,731	153,523	176,364	202,389	227,366
2. Government Expenditure	28,576	30,359	34,607	39,485	43,750	52,237	52,086	55,814	63,521	66,262
3. Education Expenditure	4,672	4,980	5,649	6,596	7,067	8,059	8,478	10,108	10,794	11,348
4. Technical Education Expenditure	854	590	1,092	1,568	1,162	1,267	1,143	1,683	1,983	2,119
Annual Growth (percent)										
1. GNP		14.9	11.4	15.8	10.8	13.2	10.7	14.9	14.8	12.3
2. Government Expenditure		6.2	14.0	14.1	10.8	19.4	-0.3	7.2	13.8	4.3
3. Education Expenditure		6.6	13.4	16.8	7.1	14.0	5.2	19.2	6.8	5.1
4. Technical Education Expenditure		-30.9	85.1	43.6	-25.9	9.0	-9.8	47.2	17.8	6.9
Ratios (percent)										
2. Government Expenditure	38.3	35.4	36.2	35.7	35.7	37.7	33.9	31.6	31.4	29.1
2. Education Exp./GNP	6.3	5.8	5.9	6.0	5.8	5.8	5.5	5.7	5.3	5.0
3. Education Exp./Government Exp.	16.3	16.4	16.3	16.7	16.2	15.4	16.3	18.1	17.0	17.1
4. Technical Exp./Education Exp.	18.3	11.8	19.3	23.8	16.4	15.7	13.5	16.7	18.4	18.7

Note: GNP at current market prices.

Source: Economic Report 1991/92 and 1995/96, Ministry of Finance.

Technical Education Department expenditure from Ministry of Education.

EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP AND SECTOR, 1990-2000 (^{'000 persons and percent})

Sector	1990	1995	1996	1997	2000	Net Job Creation (1995-2000)	
						percent	percent
Agriculture, Forestry, and Fishing	1,738.0	1,428.7	1,375.9	1,344.6	1,187.7	-241.0	-20.9
Mining and Quarrying	37.0	40.7	41.8	42.3	44.5	3.8	0.3
Manufacturing	1,333.0	2,051.6	2,209.0	2,325.3	2,616.3	564.7	49.1
Construction	424.0	659.4	705.1	746.8	845.4	186.0	16.2
Finance, Insurance, Business Services, and Real Estate	258.0	378.5	394.5	413.8	479.0	100.5	8.7
Transport, Storage, and Communication	302.0	395.2	420.4	443.9	506.9	111.7	9.7
Government Services	850.0	872.2	876.6	880.9	894.2	22.0	1.9
Other Services ^a	1,744.0	2,089.0	2,157.5	2,245.0	2,492.2	403.2	35.0
Total Employment	6,686.0	7,915.4	8,180.8	8,442.6	9,066.2	1,150.8	100.0
Total Labor Force	7,042.0	8,140.0	8,398.2	8,663.2	9,327.1		
Local	6,752.0	7,490.0	-	-	8,546.1		
Foreign	290.0	650.0	-	-	781.0		
Unemployment	356.0	224.6	217.4	220.6	260.9		
(percent)	5.1	2.8	2.6	2.5	2.8		

^a Includes electricity, gas, and water; wholesale and retail trade; hotels, restaurants, and other services.
Source: Seventh Malaysia Plan and Economic Report 1996/97, Ministry of Finance.

EXTERNAL ASSISTANCE TO THE EDUCATION SECTOR

Table 1: Multilateral Lending

Year	World Bank		Asian Development Bank	
	Project	Amount (\$ million)	Project	Amount (\$ million)
1969	Education	8.8		
1972	Second Education	15.5		
1974	Third Education	19.0		
1976	Fourth Education	28.5		
1979	Fifth Education	26.8		
1980			Vocational Education	20.0
1982	Industrial Training	40.6		
1983			Second Vocational Education	58.0
1985	Second Industrial Training	73.3		
1986	Primary and Secondary Education	127.0		
1987	University Development	48.2	Third Vocational Education	68.8
1988	Second Primary and Secondary Education	58.8		
1992	Third Primary and Secondary Education	141.0		
1993	Polytechnic Development	107.0		
1995			Technical and Vocational Education	72.0
Total		694.5		146.8

Source: IBRD, Statement of Loans, Jan. 31, 1995 and ADB.

Table 2: TAs Financed by the Bank

Year	TA	Type	Amount (\$)
1990	Technical and Vocational Education and Industrial Training Study	PP	468,000
1990	Study on Key Issues Relating to Human Resource Development in Sabah and Sarawak	A&O	99,500
1996	Upgrading the Labor Market Information System	A&O	560,000
1997	Technical Education Project	PP	100,000
Total			1,227,500

A&O=advisory and operational, PP=project preparatory.

IMPLEMENTATION STATUS OF THE TECHNICAL AND VOCATIONAL EDUCATION PROJECT

A. Background, Objectives, and Scope

1. The Bank has assisted the Government of Malaysia in strengthening vocational education at the upper secondary level since 1980 through three vocational education projects,¹ which supported qualitative improvement and quantitative expansion of the vocational education system by upgrading existing secondary vocational schools (SVSs) and establishing new SVSs in selected locations. All three projects have been completed. The project completion reports concluded that they achieved their objectives and enhanced the status of vocational education in Malaysia. The project performance audit reports for the Vocational Education Project and the Second Vocational Education Project concluded that they were successful in laying the foundations for implementing qualitative improvements in vocational education in the country, enhancing staff competencies, and increasing the efficiency of the SVSs.

2. The Technical and Vocational Education Project (TVEP)² is designed to build on the achievements of the first three projects by strengthening technical and vocational education (TVE), including both SVSs and secondary technical schools (STSs). The Bank is providing a loan of \$72.0 million for TVEP. The loan was approved in May 1995 and became effective in January 1996. The executing agency is the Ministry of Education (MOE).

3. The principal objective of the Project is to improve the quality of TVE, to prepare students for further engineering and business education, and to meet the emerging manpower needs of industry and commerce. The second objective is to increase access to TVE throughout the country by expanding the capacity of the TVE system. Particular emphasis is placed on improving access for low income groups and female students. The third objective is to enhance the internal efficiency and cost effectiveness of TVE by strengthening management systems and staff development.

4. The Project includes the following components:

- (i) constructing eight new STSs;
- (ii) upgrading and expanding nine STSs and 31 SVSs;
- (iii) upgrading and strengthening the Technical Teachers Training College;
- (iv) strengthening four existing equipment repair centers; and
- (v) other measures to support policy reforms and strengthening management capacity, including (a) creating school advisory committees, and establishing career guidance, industrial liaison, and placement units in SVSs and STSs to

¹ Loan No. 476-MAL: *Vocational Education Project*, for \$20.0 million, approved on 30 October 1980; Loan No. 673-MAL: *Second Vocational Education Project*, for \$58.0 million, approved on 20 December 1983; and Loan No. 840-MAL: *Third Vocational Education Project*, for \$68.0 million, approved on 1 September 1987.

² Loan No. 1355-MAL: *Technical and Vocational Education Project*, for \$72.0 million, approved on 30 May 1995.

strengthen linkages with industry and enhance career guidance for students; (b) assisting MOE in reviewing and evaluating the integrated secondary TVE curriculum; (c) promoting female participation in TVE; (d) reviewing and strengthening the new secondary TVE curriculum to enhance its content on environmental awareness and occupational safety and health; (e) strengthening the educational management information system and benefit monitoring and evaluation and supporting educational studies; and (f) institutional strengthening and staff development.

B. Initial Implementation Experience

5. The Project is being implemented by the Project Implementation Unit (PIU) in the Development, Privatisation and Supply Division of MOE, which is responsible for all MOE development projects and has extensive experience in the implementation of Bank-financed projects. Implementation arrangements are fully in line with those envisaged at appraisal. A qualified Project Director and Project Manager were appointed prior to implementation, and the PIU has been fully staffed and operational since inception. The Project Coordination Committee, which provides policy guidance and coordinates all implementation activities, has convened regularly twice a year.

6. The most recent implementation review was completed in September 1997. It noted that overall progress in implementation is satisfactory. Progress on civil works was generally on schedule. Of a total of 49 schools and institutions, contracts had been awarded and construction was under way at 36 sites and was fully on schedule. Tendering for the remaining 13 contracts was in progress, all contracts were expected to be awarded by the end of 1997, and only minor delays (not more than six months) were anticipated. Procurement of equipment, furniture, and instructional materials was under preparation and will follow civil works, generally on schedule. External fellowships were ahead of schedule and are expected to be 85 percent completed by the end of 1997. This will facilitate the early implementation of in-country training programs and the effective implementation of the educational changes supported by the Project.

7. Delays were encountered in implementing the consulting services, which were five months behind schedule. The terms of reference and draft contract for the consulting services component had been finalized, and the Bank reviewed with the Government the steps necessary to accelerate the selection and appointment of consultants. Contract award was only slightly below projections (\$10.2 million as of 30 September 1997, compared with projections of \$10.9 million), but disbursements were below projections (\$3.3 million as of 30 September 1997, compared with projections of \$7.5 million). The cause was identified as the delayed submission of vouchers and other supporting documents from the state to the Central level within the Public Works Department. Remedial action has been reviewed with the Government to avoid similar delays in the future.

8. Initial lessons learned were reviewed with the PIU and selected schools. They include (i) the need to ensure that teacher training keeps pace with changes in the TVE curriculum and programs, particularly given the relatively rapid pace of development and change; (ii) the importance of benefit monitoring and evaluation and labor market information as management tools, to enhance the efficiency of TVE; and (iii) the need for the Bank and the Government to coordinate closely in procurement of civil works contracts and to ensure full mutual understanding of procurement policies, procedures, and practices, to avoid implementation delays.

PROJECT COMPONENTS

1. The Project consists of three components, which are described below.

- A. **Component 1: Strengthening Technical Education Organization, Management, and Delivery**

2. This component will support the effective planning and implementation of key changes in the technical and vocational education (TVE) system, in particular the introduction of contextual learning; the piloting of "smart" secondary technical schools (STSs); related curriculum development, including the review of vocational programs and technical electives; teaching and learning materials development; and related capacity building and management information systems development in the Ministry of Education (MOE). It will be supported by the broader policy review of technical education and skill training being undertaken by the associated technical assistance. The component is split into three subcomponents, which will be implemented through a coordinated program of international consultants, domestic consultants, research and development, external fellowships, and in-country training seminars and workshops.

1. **Development of Contextual Learning and "Smart" School Programs**

3. The subcomponent will support the Technical Education Department (TED) and the STS system in developing and implementing contextual learning as the principal strategy for imparting technical education, reviewing the initial implementation of the approach, and recommending adjustments and planning its further development. Initially contextual learning will be developed for teaching mathematics and science subjects; in the light of initial experience gained, its wider use for other subjects and the vocational stream will be considered.

4. The Project will provide external fellowships for key MOE and STS system staff to review the experience of other countries with various forms of contextual learning, and for industry representatives accompanied by MOE staff to review the experience of enterprises in selected countries currently using contextual learning (e.g., Australia, Germany, Republic of Korea, Netherlands, United Kingdom, United States). The Project will provide resources for international and domestic consultants, supported by research studies in selected areas, to assist MOE in the development and review of different aspects of contextual learning, including the broader implications of the approach for the TVE system, the subjects to be covered by contextual learning, teacher comprehension and assessment, cooperation with industry, and the need for review and adjustment as a basis for further development.

5. The subcomponent will support TED and the MOE task force on "smart" schools in the initial implementation of the "smart" school approach in four pilot STSs, the review and assessment of the initial experience gained, and the broader introduction of the approach in the STS system. The Project will provide for external fellowships for key MOE and TED officials to review the experience gained in educational approaches using advanced information technology in other countries (e.g., Australia, Germany, Japan, New Zealand, United Kingdom, United States). The Project will provide international and domestic consultants, supported by research studies in selected areas, to review the educational implications of "smart" STSs, review cost implications and propose the most cost effective approaches, and review the further development of "smart" school equipment.

2. Curriculum and Learning Materials Development

6. The upgrading of the STS system has brought into focus the question of the longer term future of vocational programs under the Malaysian Certificate of Education (MCE, Vocational), and the need to expand the technical electives offered under MCE. The Project will support MOE in reviewing both issues and further developing the technical curriculum. Provision is made for external fellowships to review TVE curricula in other countries; external training in curriculum development; and international and domestic consultants to assist TED in curriculum planning, review of vocational and technical electives, and developing new technical electives.

7. The effective introduction of contextual learning and "smart" schools will require the comprehensive development of new learning materials of a high technical standard. The development, validation, and production of learning materials to support these changes will take place over several years. The Project will support MOE and TED in (i) preparing a master plan and detailed implementation program for learning materials development, and (ii) developing a comprehensive set of core learning materials designed to meet the needs of a revise STS curriculum built around contextual learning and "smart" technology. Provision is made for external fellowships for key curriculum development staff to review curriculum models and learning materials approaches in other countries, as an input to the preparation of the master plan. The Project provides resources for the development of multimedia learning materials for key academic, mathematics and science subjects, and for contextual learning materials for engineering subjects. The learning materials development will be carried out by international and domestic consultants from one or several specialized firms.

3. Management Development

8. The Project will strengthen the capacity of MOE and TED to plan and manage STS programs. The use of the benefit monitoring and evaluation (BME) for policy development and program management will be further developed. Provision is made for external fellowships in human resource planning; international and domestic consultants to assist in the further development of the educational management information system and BME, carry out tracer studies, and conduct staff training for data analysis for educational management; and the training of about 160 staff from TED and educational institutions in data analysis and the conduct of tracer studies. Provision is made to strengthen the research and development activities of TED, in support of program development. Provision is also made for external training in civil works project management for staff of MOE and the Public Works Department.

B. Component 2: Strengthening Staff Development

9. The Project will strengthen the capabilities of the TED Staff Development Division and the network of STSs and polytechnics under TED to provide in-service staff and teacher training. The Project also provides resources for a study to review the longer term staff development and teacher training needs of the STS system, including in-service training and upgrading of teachers' academic qualifications.

1. Strengthening Teacher Training

10. The Project will provide external fellowships for selected teachers and teacher trainers in pedagogical and technical aspects of contextual learning and "smart" school applications, teacher training, and testing and examination; and international and domestic consultants for teacher training planning and the development of short-term in-service training programs to upgrade teachers' curriculum, technical, and pedagogical skills. Based on these activities, domestic fellowships will be provided for about 150 teachers/teacher trainers, and in-service workshops will be organized to upgrade pedagogical skills (750 teachers), curriculum and technical skills (870 teachers), and technical English (180 teachers).

2. Strengthening School Management Training

11. The Project will strengthen management and staff training at the school level. The subcomponent will focus on training to support the changes taking place in the STS system, in particular for financial and resource management, facilities, and equipment maintenance management, and "smart" technology management. Twelve STS principals and senior assistants will receive external training in school management and will participate in planning and implementing in-country management training; an international consultant will assist in the preparation of a school management training module; and 180 principals and senior assistants will receive management training. The project includes domestic consultants to prepare training programs for STS support staff; domestic fellowships to train 170 trainers; and seminars/workshops to train about 320 technicians and laboratory assistants, 60 equipment maintenance and repair staff, and 180 wardens. Periodic short-term training will also be provided to update about 300 principals' and teachers' familiarity with "smart" school technology.

C. Component 3: Establishing and Upgrading STS Facilities and Equipment

12. Four new STSs will be constructed and equipped. The STSs will offer three technical engineering subjects and will pilot the "smart" STS concept. They will be located strategically in Peninsular Malaysia, including one built in Sepang adjacent to the newly designated multimedia super corridor. The STSs will be built in accordance with new criteria established for "smart" STSs, with specially designed facilities for academic subjects; laboratories and workshops for mechanical, electrical, and civil engineering; and resource areas, administrative facilities, and hostels. They will be provided with furniture and equipment to "smart" STS specifications, including computers and other information technology equipment. They will also be provided with relevant teaching and learning resource materials, including communications software and interactive programs. Each new STS has a projected enrollment at Project completion of 1,200.

13. The facilities and equipment of 17 recently redesignated STSs will be upgraded to provide them with the physical facilities to accommodate technical electives. The STSs will be provided with some new construction; alterations to existing workspaces to accommodate the new laboratories, resource areas, and classrooms; and additional student hostel accommodation. New equipment and furniture necessary for the technical subjects will be provided, together with teaching and learning materials. The schools will be provided with computer classrooms, but will not be upgraded to "smart" STS specifications. The 17 STSs will increase their enrollment capacity from 11,616 students in 1996 to 24,260 students at Project completion.

PROJECT INSTITUTIONS, FIELDS OF STUDY, AND ENROLLMENTS

Table 1: Fields of Study and Current and Projected Enrollment at Project Institutions

I. New STSs		Field of Study				Projected Enrollment (2002)	
No. State	Name/Location	Civil Engineering	Electrical Engineering	Mechanical Engineering			
1 Johor	STS Pontian	X	X	X		1,200	
2 Kedah	STS Pendang	X	X	X		1,200	
3 Pahang	STS Jengka	X	X	X		1,200	
4 Selangor	STS Sepang	X	X	X		1,200	
Total						4,800	

II. Existing SVSs for Upgrading		Field of Study				Enrollment	
No. State	Name/Location	Civil Engineering	Electrical Engineering	Mechanical Engineering	Current (1996)	Projected Technical (2002)	Projected Vocational (2002)
1 Johor	Kluang	X	X	X	835	960	520
2 Johor	Muar	X	X	X	1,031	1,040	560
3 Johor	(Trade) Johor Bahru	X	X		648	640	360
4 Kedah	Langkawi	X	X	X	568	1,200	370
5 Kedah	Sungai Petani 2	X	X	X	836	800	580
6 Kelantan	Pengkalan Chepa	X	X	X	696	800	360
7 Kelantan	Tanah Merah	X	X	X	1,002	800	840
8 Negeri Sembilan	(Agriculture) Rembau	X	X	X	162	1,200	180
9 Pahang	(Agriculture) Chenor	X	X	X	155	1,200	160
10 Pahang	(Trade) Temerloh	X	X	X	717	1,040	400
11 Perak	Taiping	X	X	X	879	1,200	440
12 Perak	(Agriculture) Teluk Intan	X	X	X	212	1,200	200
13 Perlis	Kangar	X	X	X	899	1,200	410
14 Pulau Penang	Butterworth	X	X	X	673	800	580
15 Pulau Penang	Batu Lanchang	X	X	X	486	1,040	220
16 Selangor	Klang	X	X	X	994	1,200	400
17 Terengganu	Kuala Terengganu	X	X	X	823	800	560
Total					11,616	17,120	7,140
							24,260

Total Enrollment in New STSs and Upgraded SVSs to be Assisted by the Project	1996	2002
Projected Increase in Enrollment (1996 - 2002)	11,616	29,060
Percentage Increase (1996 - 2002)		17,444
		150

Table 2. Enrollment Profile of Proposed Project Institutions
(as of 30 June 1996)

No.	State	Name/Location	Enrollment					
			By Gender			By Stream		
			Male	Female	Total	Percent	Male	Percent
1	Johor	Kluang	581	254	835	70	661	79
2	Johor	Muar	727	304	1,031	71	804	78
3	Johor	(Trade) Johor Bahru	640	8	648	99	471	73
4	Kedah	Langkawi	379	189	568	67	496	87
5	Kelantan	Pengkalan Chepa	597	99	696	86	460	66
6	Kedah	Sungai Petani 2	627	209	836	75	587	70
7	Kelantan	Tanah Merah	704	298	1,002	70	762	76
8	Negeri Sembilan	(Agriculture) Rembau	80	82	162	49	162	100
9	Pahang	(Agriculture) Chenor	94	61	155	61	155	100
10	Pahang	(Trade) Temerloh	517	200	717	72	584	81
11	Perak	Taiping	645	234	879	73	682	78
12	Perak	(Agriculture) Teluk Intan	100	112	212	47	193	91
13	Perlis	Kangar	639	260	899	71	703	78
14	Pulau Penang	Butterworth	543	130	673	81	482	72
15	Pulau Penang	Batu Lanchang	469	17	486	97	392	81
16	Selangor	Klang	719	275	994	72	746	75
17	Terengganu	Kuala Terengganu	601	222	823	73	689	84
Total			8,662	2,954	11,616	75	9,029	78

Source: MOE.

PROJECT COST ESTIMATES (\$ '000)

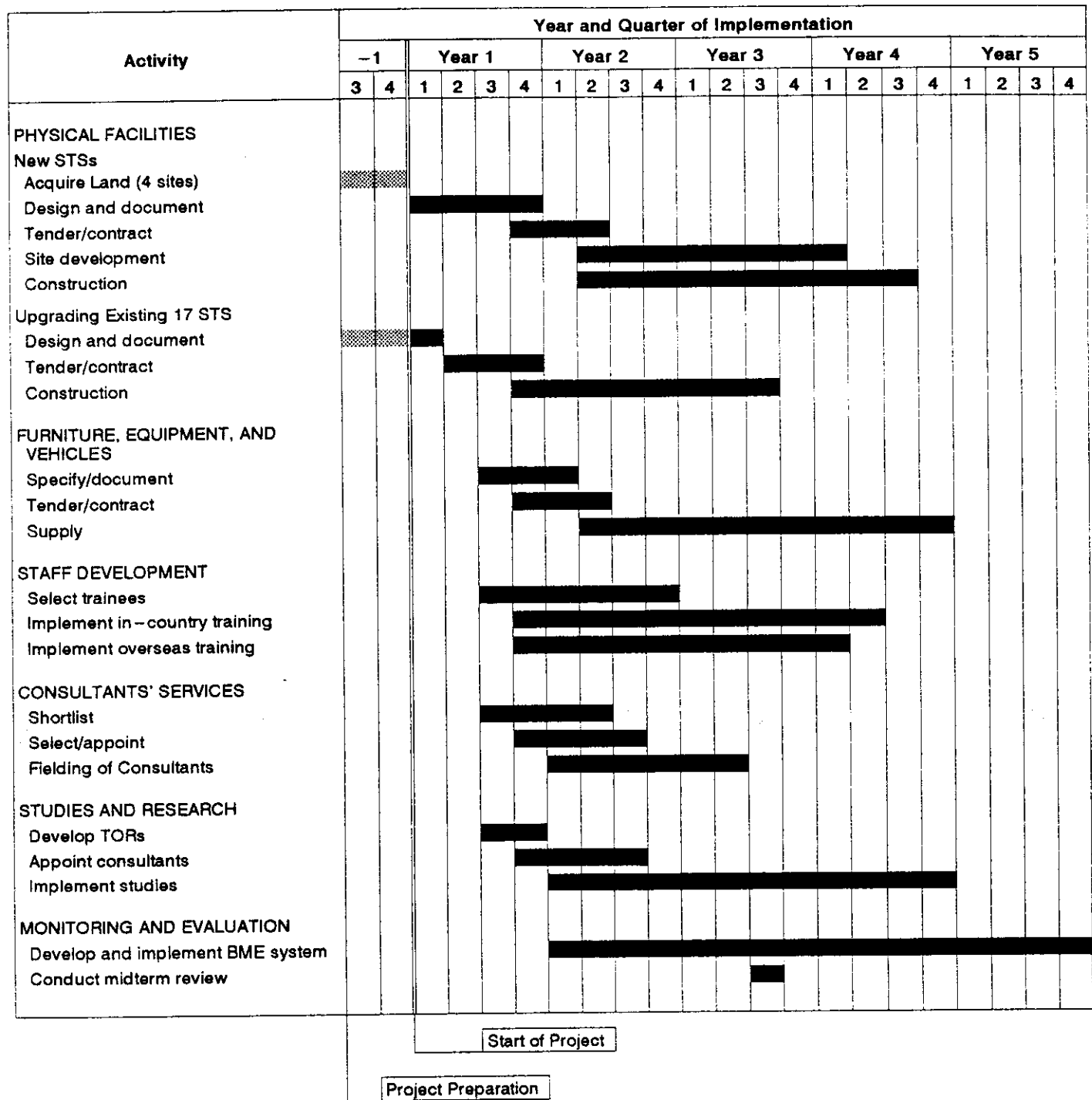
Item	Foreign Exchange	Local Currency	Total Cost
A. Base Cost			
1. Physical Facilities			
a. Construction—New STSs	16,558	27,016	43,575
b. Construction—Upgrading	13,157	21,467	34,624
Subtotal (1)	29,716	48,483	78,199
2. Furniture and Equipment			
a. Furniture	774	1,806	2,581
b. Equipment	5,875	581	6,457
c. Vehicles	384	0	384
d. Books and Instructional Materials	163	41	204
Subtotal (2)	7,196	2,428	9,625
3. Staff Development			
a. In-country Fellowships		1,851	1,851
b. Overseas Fellowships		0	1,755
Subtotal (3)	1,755	1,851	3,606
4. Consultant Services			
a. Domestic Consultants			
i. Civil Works Design and Supervision	0	2,581	2,581
ii. Academic	0	590	590
b. International Consultants	1,297	324	1,621
Subtotal (4)	1,297	3,495	4,792
5. Research and Development	36	144	180
6. Taxes and Duties	0	7,820	7,820
Total Base Cost	40,000	64,221	104,220
B. Contingencies			
1. Physical Contingency	2,690	3,967	6,657
2. Price Escalation	2,266	4,632	6,918
Total Contingencies	4,956	8,599	13,575
C. Interest and Other Charges			
	9,195	0	9,195
Total Project Cost	54,151	72,820	126,990

- Notes: 1. Base costs are as of June 1997.
2. Taxes and duties are calculated at 10 percent of civil works.
3. Physical contingencies are computed at 5 percent for new school construction, 10 percent for upgrading construction, and 5 percent for furniture and equipment.
4. Price escalation is calculated at 2.7 percent.
5. Some figures do not tally because of rounding.

PROPOSED FINANCING PLAN
(\$'000)

Cost Component	Total Cost			Bank Financing			Government Financing		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Base Cost									
1. Physical Facilities									
a. Construction—New STSs	16,558	27,016	43,575	16,558	0	16,558	0	27,016	27,016
b. Construction—Upgrading	13,157	21,467	13,157	13,157	0	13,157	0	21,467	21,467
Subtotal (1)	29,716	48,483	78,199	29,716	0	29,716	0	48,483	48,483
2. Furniture and Equipment									
a. Furniture	774	1,806	2,581	774	0	774	0	1,806	1,806
b. Equipment	5,875	581	6,457	5,875	0	5,875	0	581	581
c. Vehicles	384	0	384	384	0	384	0	0	0
d. Books and Instructional Materials	163	41	204	163	0	163	0	41	41
Subtotal (2)	7,196	2,428	9,625	7,196	0	7,196	0	2,428	2,428
3. Staff Development									
a. In-country Fellowships	0	1,851	1,851	0	0	0	0	1,851	1,851
b. Overseas Fellowships	1,755	0	1,755	1,755	0	1,755	0	0	0
Subtotal (3)	1,755	1,851	3,606	1,755	0	1,755	0	1,851	1,851
4. Consultants' Services									
a. Domestic Consultants									
i. Civil Works Design and Supervision	0	2,581	2,581	0	0	2,581	0	2,581	2,581
ii. Academic	0	590	590	0	0	590	0	590	590
b. International	1,297	324	1,621	1,297	0	324	0	324	324
Subtotal (4)	1,297	3,495	4,792	1,297	0	3,495	0	3,495	3,495
5. Research and Development	36	144	180	36	0	144	0	144	144
6. Taxes and Duties	0	7,820	7,820	0	0	7,820	0	7,820	7,820
Total Base Cost	40,000	64,221	104,220	40,000	0	64,221	0	64,221	64,221
B. Contingencies									
1. Physical Contingencies	2,690	3,967	6,657	0	0	0	2,690	3,967	6,657
2. Price Contingencies	2,286	4,632	6,918	0	0	0	2,286	4,632	6,918
Total Contingencies	4,977	8,599	13,575	0	0	0	4,977	8,599	13,575
C. Interest and Other Charges									
	9,195	0	9,195	0	0	0	9,195	0	9,195
Grand Total	54,171	72,820	126,990	40,000	0	40,000	14,171	78,820	86,991

PROJECT IMPLEMENTATION SCHEDULE



OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The Project provides for 96 person-months of international and 236 person-months of domestic specialist services (see Table 1). The outline terms of reference for the specialist services are provided below.

A. Development of Contextual Learning and "Smart" School Programs

1. **Experts in Contextual Learning Approaches** (International; 2 experts for 6 person-months each)

2. The experts will (i) review Technical Education Department (TED) policies and the progress made in introducing contextual learning; (ii) assist in further developing an appropriate contextual approach for the secondary technical school (STS) system; (iii) review the impact and success of contextual learning, in particular the curriculum and related materials, their comprehension and use by teachers and students, and their effect on overall standards; and (iv) review the broader implications for the STS and technical and vocational education (TVE) system, including benefits, costs, and internal and external efficiency, and make recommendations for further development. The experts will work in close cooperation with the domestic consultants on contextual learning and "smart" school applications.

2. **Experts in "Smart" School Design and Implementation** (International; 2 experts for 4 person-months each)

3. The experts will (i) review TED policies and progress made in developing and introducing the "smart" school curriculum; (ii) in consultation with the team of domestic experts, design an approach for "smart" STS evaluation; (iii) assess the impact of the "smart" school approach by evaluating the curriculum, related materials, their comprehension and use by teachers and students, and their effects on overall educational standards; (iv) compare experiences with other "smart" schools in the general school system; and (v) review the broader implications for the STS and TVE system, including benefits, costs, and internal and external efficiency, and make recommendations for further development. The experts will work in close cooperation with the domestic consultants on "smart" school development, and the Ministry of Education task force on "smart" schools.

3. **Expert in "Smart" School Equipment** (International; one person-month)

4. The expert will (i) review the design of the four pilot "smart" STSs and their equipment schedules, and assess the use of equipment and facilities by teachers and students; (ii) assess the maintenance of equipment and facilities; and (iii) make recommendations regarding the appropriateness of "smart" STS equipment, facilities, maintenance, and related training, as a basis for the further development of "smart" STSs. The expert's report will be presented together with that of the experts on "smart" school design and implementation.

4. **Expert in STS-Industry Relations** (International; 3 person-months)

5. The expert will assist TED in developing a strategy, at the national and local enterprise levels, for strengthening cooperation between the STS system and industry and commerce to support the new educational approaches. The expert will work closely with the Planning and Research Division and will (i) plan and accompany a study visit of human resource

managers from key industries and senior TED staff to review working examples of contextual learning and "smart" school environments; (ii) prepare a national strategy aimed at increasing employers' awareness of the productivity benefits to be gained from these approaches; and (iii) develop policies for TED to accommodate increased industry contacts at the national and school levels.

5. Experts in Contextual Learning and "Smart" School Applications (Domestic; 5 experts for 6 person-months each)

6. The international consultants will cooperate closely with a team of five domestic consultants in reviewing the initial experience gained in contextual learning and "smart" school applications making recommendations and detailed proposals for their further development. The team of domestic consultants will include (i) an expert in technical education standards, to assess student achievements under the new approaches compared with traditional STS student performance; (ii) an expert in educational technology, including computer-assisted learning, to review the installation, use, and maintenance of equipment, and the suitability of the equipment provided; (iii) an expert in teacher training and assessment, to review teacher comprehension and the use of the new approaches, identify gaps, and propose necessary adjustments; (iv) an expert in curriculum materials, to assess the relevance of teaching and learning materials in use; and (v) an expert in educational planning to gather and review data on the financial and efficiency implications of the new approaches.

B. Curriculum and Learning Materials Development

1. Expert in Technical Curriculum Planning (International; 3 person-months)

7. The expert will work closely with TED to (i) review the system for selecting new technical electives and recommend any necessary improvements to the system; (ii) review changes in the technical and vocational streams and the need for curriculum changes, including the introduction of new technical electives; and (iii) prioritize new areas for technical curriculum development and prepare detailed terms of reference for the work.

2. Experts in Curriculum Development for new Electives (2 international experts for 5 person-months each; and 4 domestic experts for 4 person-months each)

8. Once TED has defined the specific areas in which new technical electives will be developed (possible areas include biotechnology, horticulture, computer-aided design and manufacture, robotics, and total quality management) or existing electives strengthened, a team of experts will review curriculum needs and develop new curricula in the specified areas. The experts will (i) review current curriculum models and prepare new outlines in similar format using contextual learning as the curriculum approach; (ii) review experience gained from related vocational or technical curriculum by STSs, industry committees, the private sector, and academic institutions; (iii) prepare curricula and determine necessary learning materials and teachers guides; and (iv) validate new curricula in STSs, and prepare necessary modifications.

3. Experts in Learning Materials Development (International/Domestic; a team of experts, 36 person-months international and 36 person-months domestic)

9. The team of international and domestic experts will be provided under a contract with a firm specialized in learning materials development. The team will develop, test, and finalize

a comprehensive set of core learning materials designed to meet the needs of a revised STS curriculum based on contextual learning and "smart" technology. The learning materials will include multimedia materials, will reflect Malaysian culture and values, and will use gender-neutral illustrations and examples. The team will work closely with the Technical and Vocational Curriculum Division, the Curriculum Development Center, and the MOE task force on "smart" schools. Specific activities include (i) reviewing the curriculum needs, approaches, and standards of the STS system as a basis for learning materials development; (ii) identifying key learning principles for preparation of multimedia materials for STSs; (iii) developing a core set of multimedia materials for general and technical subjects in STSs; (iv) field testing materials in selected STSs in conjunction with TED and incorporating feedback; and (v) packaging the final product with teachers guides and learning materials.

C. Management Development

1. Experts in Educational Management Information Systems

(International/Domestic; 1 international expert for 3 person-months, and 2 domestic experts for 5 person-months each)

10. The experts will advise managers and senior staff of TED in the analysis of educational management information system (EMIS) and benefit monitoring and evaluation (BME) data for policy planning, management, and STS administration, and will assist in the further development of the system to enhance its analytical use. Under the responsibility of the Planning and Research Division the experts will (i) review the available data systems and report formats and assist in preparing a plan for additional data or reporting needed to enhance the analytical use of EMIS and BME; (ii) prepare model analyses and reports on priority issues (iii) assess the training needs of TED senior staff and prepare a staff training package consisting of group and individual learning materials; and (iv) conduct a series of short seminars on the EMIS data analysis for TED staff. The expert will work in close cooperation with the two domestic consultants assigned to TED and the Educational Planning and Research Division (EPRD).

2. Experts in Tracer Studies (Domestic; two experts for 5 person-months each)

11. The experts will work closely with the Planning and Research Division to further develop TED's tracer and reverse tracer study system. The experts will (i) review the current system for establishing baseline data and initiating tracer studies, and TED's experience in recent tracer studies, to identify gaps and weaknesses in design and implementation; (ii) prepare and validate questionnaire design for reverse tracer studies to be conducted at universities, polytechnics, and among employees of selected industries; (iii) undertake tracer studies; (iv) make recommendations regarding the strengthening of mechanisms for the conduct of tracer studies of STS graduates on a regular basis in the context of BME; and (v) analyze data and prepare an integrated report on findings for TED. The experts will cooperate with the management information systems experts in conducting workshops and seminars. The experts will also consult closely with EPRD and EMIS.

D. Staff Development

1. Expert in Planning of Technical Teacher Training (International; 6 person-months)

12. The expert will work under the auspices of the Staff Development Division to

prepare a revised strategy for teacher education and training, based on an assessment of changing needs. The expert will also coordinate with other TED units, Institut Aminuddin Baki, Technical Teachers Training College, and Universiti Teknologi Malaysia. The expert will (i) assess the need for different types of training among all categories of serving teachers, including of the need for degrees, diplomas, technical curriculum, and pedagogical upgrading; (ii) review training needs arising from ongoing and anticipated organizational, curriculum, and pedagogical changes; (iii) review and assess the various options for preservice and in-service training for all categories of STS teachers; and (iv) prepare a master plan for STS teacher education and training; and (v) prepare outline recommendations on teacher recruitment, career planning, incentives, and professional recognition.

2. Expert in Pedagogical Teacher Training (International; 5 person-months)

13. The expert will work under the Staff Development Division, and will cooperate closely with the team of seven domestic experts in pedagogical teacher training. The expert will (i) review the provisions and levels of preservice and in-service pedagogical training for STS teachers, including the recommendations of the international consultant on teacher training planning; (ii) design the formats for one-week training packages to upgrade teachers in pedagogical skills with particular reference to contextual learning and "smart" STS technology as a basis for the work of the team of domestic consultants in pedagogical training; (iii) review the framework for preservice technical teacher training to ensure that pedagogical aspects are fully covered; (iv) assist with the staff development of preservice technical teacher trainers; and (v) participate in workshops and seminars on all aspects of preservice and in-service technical teacher training, monitor progress, and ensure that feedback is used to modify plans and programs.

3. Experts in Pedagogical Teacher Training (Domestic; 7 experts for 8 person-months each)

14. The domestic experts will work closely with the international expert to design, deliver, and revise a packaged program for upgrading pedagogical skills of STS teachers (technical and vocational) to meet the demands of contextual learning and "smart" STS technology. These upgrading packages will be delivered at one-week workshops at selected locations throughout the country. In their respective technical fields, the experts will (i) assess the pedagogical needs of teachers in the context of their new learning environments; (ii) develop appropriate pedagogical learning modules for use in a teaching environment; (iii) develop and apply practical tests for the assessment of teachers in the new techniques; (iv) conduct a series of training workshops and revise pedagogical modules based on feedback obtained; and (v) conduct follow-up assessments and provide assistance to STS teachers as required.

4. Expert in Technical Teacher Training (International; 5 person-months)

15. The expert will work under the Staff Development Division and will cooperate closely with a team of seven domestic experts in technical teacher training for different electives. The expert will (i) review the provision and level of preservice and in-service training for STS teachers with respect to curriculum development processes and implementation; (ii) design the formats for one-week training packages to upgrade teachers in curriculum/technical skills with particular reference to contextual learning and "smart" STS technology as a basis for the work of the team of domestic consultants in technical teacher training; (iii) review the framework for preservice technical teacher training to ensure that curriculum aspects are fully covered; (iv)

assist with the staff development of preservice technical teacher trainers; and (v) participate in workshops and seminars on all aspects of preservice and in-service technical teacher training, monitor progress, and ensure that feedback is used to modify plans and programs.

5. Experts in Technical Teacher Training (Domestic; 7 experts for 8 person-months each)

16. The domestic experts will have expertise in different technical electives, and will work closely with the international expert in technical teacher training to design, deliver, and revise modular programs in their respective electives designed to reflect new curriculum modalities and content. The modules will be delivered at one-week workshops at selected locations throughout the country. In their respective technical fields the experts will (i) assess the curriculum/technical upgrading needs of teachers in the context of recent learning and technological development; (ii) develop/revise appropriate curriculum modules, learning materials, and teachers guides under the direction of the Technical/Vocational Development Division; (iii) conduct a series of workshops and revise curriculum modules on the basis of feedback obtained; and (iv) conduct follow-up assessments and provide assistance to STS teachers as required.

6. Expert in Management Training for Principals (International; 4 person-months)

17. The expert will work with the Staff Development Division and will (i) assess the management skills required by STS principals and senior assistants in the context of recent and anticipated developments in the STS system; (ii) prepare a specialized management training module with particular emphasis on resource and financial management, maintenance management, and technology management; (iii) train trainers and assist TED and STSs in the initial implementation of the management training programs; and (iv) review and make recommendations regarding the preappointment training of STS principals.

7. Experts in Technician and Support Staff Training (Domestic; 4 experts for 6 person-months each)

18. The team of experts will work under the supervision of the Staff Development and Management Divisions of TED to upgrade the administrative and management skills of STS support staff relating to new equipment, technology, and changes in teaching methods in workshops and laboratories. Basic elements of maintenance management and cost accounting will also be included in the training programs. The experts will (i) review and assess the in-service training needs of technicians, laboratory assistants, equipment maintenance staff, and wardens in the light of changing learning environments, equipment, and teaching methods; (ii) develop training plans, modules, and associated learning materials; (iii) organize workshops for the training of trainers; (iv) design and conduct practical tests that ensure individual competency; and (v) conduct follow-up programs and provide advice at STSs as required.

Table 1. Summary of Consulting Services

Subcomponent/Specialization	International		Domestic		Counterpart Units
	Number of Persons	Total Person- Months	Number of Persons	Total Person- Months	
A. Development of Contextual Learning and "Smart" School Programs					Research and Planning Division, TED, TVCD,
Development and review of:					MOE "Smart" School Task Force
– Contextual learning	2	12			
– "Smart" school design	2	8			
– "Smart" school equipment	1	1			
– STS–Industry relations	1	3			
Development of contextual learning and "smart" school applications			5	30	
B. Curriculum and Learning Materials Development					TVCD, CDC
Technical curriculum planning	1	3			
Curriculum development for new electives	2	10	4	16	
Learning materials development	3	36	3	36	
C. Management Development					EPRD, Research and Planning Division, TED
Educational management information systems	1	3	2	10	
Tracer studies			2	8	
D. Staff Development					Staff Development Division, Teacher Education Division, TVCD, IAB
Planning of technical teacher training	1	6			
Pedagogical teacher training	1	5	7	56	
Technical teacher training	1	5	7	56	
Management training for principals	1	4			
Technician and support staff training			4	24	
Total	17	96	34	236	

Abbreviations:

CDC – Curriculum Development Centre
 EPRD – Education Planning and Research Division
 MOE – Ministry of Education
 IAB – Institut Aminuddin Baki
 TED – Technical Education Department
 TVCD – Technical and Vocational Curriculum Division

RESEARCH AND DEVELOPMENT PROGRAM

1. **Research Studies**
Research workshops on methodology and data analysis for educators in the technical education system to equip them with the fundamentals to conduct research projects.
2. **Action Research**
Workshops to introduce action research to practitioners in STSs and Polytechnics. Projects will be aimed at improving instructional delivery, curriculum, and educational planning by indentifying and generating solutions to problems of the institutional setting.
3. **Research and Development**
Development of innovative educational products for the technical education system using multimedia technology with emphasis on multimedia content development.
4. **Dissemination Workshops**
National level workshops to disseminate current developments and consultants' findings:
 - (i) Participation of women in technical education
 - (ii) Current issues in technical education
 - (iii) Occupational safety and health
 - (iv) ISO 9000
5. **Independent Research Studies**
The services of domestic consultants will be engaged to conduct research studies on specific areas that are necessary for medium – and long – term improvement of the technical education system, including distance education, new areas of potential demand in technical education (e.g., hospitality sector, health services, design and technology) and other priority areas to be determined during project implementation.

Total cost

\$ 180,000

STAFF DEVELOPMENT PROGRAM

Type of Training/Study Program	Duration	Number of Persons	Participants from ^a
External Training			
1. Further Development of Contextual Learning	4 weeks	8	TVCD, STD, STS Industry
2. "Smart" School Experiences	3 weeks	10	PRD, TVCD, STD, DPSD, STS, Ind.
3. "Smart" School Testing	8 weeks	6	TVCD, ES
4. "Smart" School Curriculum, Instructional and Learning Materials	8 weeks	12	TVCD, STS
5. Multimedia Learning Materials Development	12 weeks	8	TVCD, ETD, STS
6. Management Training for STS Principals and Senior Assistants	8 weeks	12	STS
7. Curriculum Development Policy/Planning	12 weeks	2	TVCD
8. Skills Upgrading and Curriculum Development for Apparel, Catering, and Entrepreneurship	6 weeks	12	TVCD, MD, STS
9. Policies for the Future of Vocational Programs	4 weeks	4	PRD, EPRD, EPU
10. Civil Works Project Management	4 weeks	6	DPSD, PWD
11. Human Resource Planning	4 weeks	3	STD
Subtotal		83	
In-country Training			
1. Training of Teacher Trainers (Curriculum)	3 weeks	75	STSs
2. Training of Teacher Trainers (Pedagogy)	3 weeks	75	STSs
3. Training of Trainers (Support Staff and Wardens)	1-2 weeks	170	STSs
4. Training of STS Principals/Senior Assistants in School Management	3 weeks	180	STSs
5. Training of TED Staff in Advanced Data Analysis	2 weeks	10	PRD
6. Training of Teachers (Technical English)	3 days	180	STSs
7. Training of Teachers (Pedagogy)	1 week	750	STSs
8. Training of Teachers (Curriculum)	1 week	750	STSs
9. Upgrading Teachers in New MCE Studies	1 week	120	STSs
10. Update on Contextual Learning/"Smart" Schools	3 days/yr	150	STSs
11. "Smart" School Management for Principals	3 days	150	STSs
12. Upgrading Support Staff and Wardens Training ^b	1 week	560	STSs
13. Conducting Tracer Studies	3 days	150	PRD, Poly, Univ
Subtotal		3,320	
Total		3,403	

^a Abbreviations: DPSD – Development, Privatisation and Supply Division
 EPRD – Education Planning and Research Division
 EPU – Economic Planning Unit
 ES – Examination Syndicate
 ETD – Educational Technology Division
 MCE – Malaysian Certificate of Education
 MD – Management Division
 PRD – Planning and Research Division
 PWD – Public Works Department
 STD – Staff Training and Development Division
 STS – Secondary Technical School
 TVCD – Technical and Vocational Curriculum Division

^b Includes laboratory technicians and equipment maintenance and repair staff

External Training Programs

1. Further Development of Contextual Learning

Number of participants	:	8
Duration	:	4 weeks
Tentative venue	:	Australia, Germany, Republic of Korea, Netherlands, UK, USA

1. The course will provide the participants with an advanced understanding of educational programs adopting the contextual learning approach based on (i) initial experience gained in its implementation in Malaysia, (ii) experiences in one or several other countries, and (iii) strengthened links between schools and industry. At the end of the course, participants will (i) be familiar with major issues and problems in the management of these programs, (ii) have acquired an insight into the theoretical perspectives and practical realities of managing the program; (iii) be able to compare and base decisions on the local technical education model and experiences in other countries, and (iv) have acquired techniques and methods in program evaluation.

2. "Smart" School Experiences

Number of participants	:	10
Duration	:	3 weeks
Tentative venue	:	Australia, Germany, Japan, New Zealand, UK, USA

2. The course will familiarize the participants with the use of "smart" delivery technology through attachments to institutions and organizations that are implementing "smart" teaching/learning approaches and review of relevant experience in school-industry cooperation. At the end of the course, participants will (i) be familiar with working examples of "smart" school experiences in other countries, (ii) have identified models that could be adopted for the Malaysian technical educational environment, (iii) be aware of advantages and constraints in various methodological approaches, and (iv) be able to manage and implement this approach to teaching-learning methodology.

3. "Smart" School Testing

Number of participants	:	6
Duration	:	8 weeks
Tentative venue	:	Australia, Germany, Japan, New Zealand, UK, USA

3. The course will train participants in developing and conducting testing and examinations for a curriculum based on "smart" technology, including assessing students' learning abilities. At the end of the course, participants will (i) understand learner-centered assessment; (ii) understand the use of technology as a tool to facilitate assessment; (iii) differentiate among various assessment methods, i.e., classroom, school-based, and centralized; and (iv) be able to use multiple approaches and instruments to conduct performance assessment.

4. **"Smart" School Curriculum, Instructional and Learning Materials**

Number of participants	:	12
Duration	:	8 weeks
Tentative venue	:	Australia, Germany, Japan, New Zealand, UK, USA

4. The course will provide planners of curriculum, instructional, and learning materials with a comprehensive understanding of key issues related to curriculum planning and development, and instructional and learning materials development using advanced information and communication technology. At the end of the course, participants will be familiar with (i) key curriculum issues related to "smart" schools and experience gained in other countries; (ii) instructional materials development issues and comparative strategies adopted in other countries; and (iii) how to develop learning materials using a variety of advanced information technologies, techniques, and methodologies.

5. **Multimedia Learning Materials Development**

Number of participants	:	8
Duration	:	12 weeks
Tentative venue	:	Australia, Germany, Japan, UK, USA

5. The course will expose the participants to the planning, design, and application of modern multimedia in the teaching/learning processes for technical education courses. At the end of the course, participants will be familiar with (i) the application of multimedia in technical education, including hands-on activities in incorporating multimedia for courseware development; (ii) multimedia planning, design, and production processes, including script writing and creation of storyboards; (iii) various computer multimedia systems; and (iv) production of multimedia resources for institutions involved in technical education, including prototype development of multimedia applications in technical education courses.

6. **Management Training for STS Principals and Senior Assistants**

Number of participants	:	12
Duration	:	8 weeks
Tentative venue	:	Australia, Germany, Japan, Thailand, UK, USA

6. The course will provide STS principals and senior assistants with training for the management of advanced, high-technology technical schools. This will enable the trainees to assist a consultant in developing a training module for STS principals/senior assistants and participate in providing such management training. At the end of the course, the participants will be fully familiar with (i) key management training issues for STSs; (ii) course content of management training used for technical school principals in other countries; and (iii) course development and delivery issues, methodologies, and techniques for management training.

7. Curriculum Development Policy/Planning

Number of participants	:	2
Duration	:	12 weeks
Tentative venue	:	Australia, UK, USA

7. The course will provide the trainees with comparative studies on advanced technical education systems in other countries and with major issues in technical education curriculum development through attachment to curriculum development centers in the education ministries of the countries chosen for the training. At the end of the course, the participants will be familiar with (i) advantages and constraints in the technical educational systems of the various countries visited; (ii) concepts and methodologies in curriculum development and review, including the modular concept and testing and evaluation as they relate to curriculum development; (iii) matching the curriculum to local social and labor market needs; and (iv) modern techniques in the effective management of a curriculum center, including budgeting, teacher training, and curriculum resources management.

8. Skills Upgrading and Curriculum Development for Apparel, Catering, and Entrepreneurship

Number of participants	:	12
Duration	:	6 weeks
Tentative venue	:	Australia, Germany, New Zealand, Switzerland, UK, USA

8. The course will provide the participants with the expertise to develop new and innovative curricula in technical education, in response to the rapidly changing labor market needs of the economy, through visits to institutions and agencies responsible for curriculum development in these areas in other countries. At the end of the course, the participants will be familiar with (i) creativity and innovation in curriculum development, (ii) concepts and methodologies in curriculum development and review, (iii) issues related to implementation of new vocational subjects, and (iv) testing and evaluation methods.

9. Policies for the Future of Vocational Programs

Number of participants	:	4
Duration	:	4 weeks
Tentative venue	:	Australia, Germany, Sweden, UK, USA

9. The course will equip the participants to review major issues and constraints in the broad development of technical and vocational education in the light of the needs of the economy, through studies comparing the Malaysian technical and vocational education with systems of selected other countries. At the end of the course, the participants will be (i) familiar with the technical and vocational education systems of the countries visited (ii) able to review relevant policy developments and directions, (iii) able to review different approaches to organizing the delivery of both formal technical education and skill training, (iv) equipped to carry out comparative studies of education systems with emphasis on national strategies and skill training, and (v) equipped to review the policy directions for the future development of technical and vocational education in Malaysia.

10. Civil Works Project Management

Number of participants	:	6
Duration	:	4 weeks
Tentative venue	:	Thailand, UK, USA

10. The course will provide the participants with management techniques for the design and supervision of civil works projects, including project planning, scheduling and monitoring negotiations with contractors, budgeting, financial control, and procurement. At the end of the course, the participants will be familiar with (i) the use of project management tools and techniques, including computer software; (ii) project monitoring tools for financial inventory and resource control; (iii) recent developments in the design and construction of education facilities; and (iv) requirements of total quality management and International Standards Organization standards as applied to civil works project management.

11. Human Resource Planning

Number of participants	:	6
Duration	:	4 weeks
Tentative venue	:	Australia, New Zealand, Sweden, UK, USA

11. The course will provide the participants with skills relevant to human resource planning, including identification of major issues and constraints in the education and training cycle, training needs analysis, evaluation of training proposals, and the design and development of effective training programs. At the end of the course, the participants will be able to (i) identify major issues and constraints in human resource development, (ii) improve the training and human resource development function within their organizations, (iii) conduct training needs analysis, (iv) appraise and evaluate specific training proposals, (v) plan and administer training programs, and (vi) evaluate the effectiveness of the training programs.

PROCUREMENT ARRANGEMENTS

Table 1: Civil Works

	State	Location	Cost Estimates (\$ million)	Mode of Procurement
A. New STSs				
1.	Johor	Pontian	12.0	ICB
2.	Kedah	Pendang	12.0	ICB
3.	Pahang	Jengka	12.0	ICB
4.	Selangor	Sepang	12.0	ICB
B. Upgrading Existing SVSs				
1.	Johor	Kluang	1.3	LCB
2.	Johor	Muar	2.3	LCB
3.	Johor	(Trade) Johor Bahru	2.7	LCB
4.	Kedah	Langkawi	2.8	LCB
5.	Kedah	Sungai Petani 2	1.8	LCB
5.	Kelantan	Pengkalan Chepa	1.9	LCB
7.	Kelantan	Tanak Merah	2.5	LCB
8.	Negeri Sembilan	(Agriculture) Rembau	2.8	LCB
9.	Pahang	(Agriculture) Chenor	3.5	LCB
10.	Pahang	(Trade) Temerloh	2.0	LCB
11.	Perak	Taiping	2.2	LCB
12.	Perak	(Agriculture) Teluk Intan	2.5	LCB
13.	Perlis	Kangar	2.4	LCB
14.	Pulau Pinang	Butterworth	1.5	LCB
15.	Pulau Pinang	Batu Lanchang	1.7	LCB
16.	Selangor	Klang	1.7	LCB
17.	Terengganu	Kuala Terengganu	2.4	LCB
Total			86.0	

Table 2: Procurement of Equipment

Equipment Specifications		Cost Estimates (\$ million)	Mode of Procurement ^a
1.	Electrical/Electronics Engineering Studies Electrical and electronics training kits, measuring devices, power meters, insulation and continuity testers, regulated DC power supplies, handtools and basic workshop materials, and audio–visual equipment	0.34	IS
2.	Mechanical Engineering Studies Bench drills, bench grinders, portable arc welding machines, basic handtools, basic laboratory test sets, micrometers, and audio–visual equipment	0.29	IS
3.	Civil Engineering Studies Soil investigation equipment, hand operated compression testing machines, tensile test machines, basic safety equipment, surveying equipment, water pipe and drainage fittings, and audio–visual equipment	0.85	ICB/IS
4.	Engineering Drawing Basic drawing studio equipment and computer–aided design equipment and plotters	0.57	IS
5.	Physics Laboratory Basic physics laboratory apparatus and supplies	1.27	ICB/IS
6.	Chemistry Laboratory Basic equipment, laboratory apparatus and supplies	1.32	ICB/IS
7.	Mathematics Laboratory Printers, peripherals and software, audio–visual equipment and projectors	0.54	IS
8.	Library Materials Reference books, textbooks, scientific and technical journals and magazines	0.20	IS/DP
9.	Administration, Canteen, Hostels, and Multipurpose Hall Office and essential communication equipment, kitchen equipment, cooking utensils, crockery, audio systems, dormitory equipment, and audio–visual equipment	1.17	LCB/DP
10.	Sports Equipment Prescribed sports equipment for schools	0.13	LCB/DP
Total		6.68	

^a The equipment will be grouped in packages linked to the schedule for the completion of the schools. Procurement will follow international competitive bidding (ICB), international shopping (IS), local competitive bidding (LCB), direct purchase (DP), or other procedures as appropriate.

FRAMEWORK FOR BENEFIT MONITORING AND EVALUATION

1. The Education Planning and Research Division (EPRD) of the Ministry of Education (MOE) has designed and commenced installation of an educational management information system (EMIS) to provide data required for policy formulation, planning, administration, and management of the education system in Malaysia. The EMIS is designed to accommodate information systems for the different subsectors of the educational system, including that of the Technical Education Department (TED). Under the Bank-financed Technical and Vocational Education Project, TED initiated the establishment of a benefit monitoring and evaluation (BME) information system for technical and vocational education (TVE). Further assistance will be provided under the Project to improve the quality of baseline data and ensure that a working interface exists with the EMIS developed by MOE. This will enable the full implementation of the system for BME of TVE. Design and implementation of the BME system are the responsibility of the Research and Planning Division of TED in cooperation with the Management Division of TED. Both work closely with EPRD.

2. Data on each secondary technical school (STS) have been entered into the system together with additional information gathered through tracer studies conducted by STS staff. These activities will continue to be supported by the Project. The BME system will provide baseline data at the start of the Project, be used for the midterm review, and measure achievements at Project completion. Once the Project is completed the data gathered will continue to be used as an integral part of the EMIS developed for TED.

3. The BME system will provide basic data on the internal and external efficiency of the TVE system and its socioeconomic impact. The data will be entered on the standard EMIS data base designed by TED and its format will be coordinated by the Research and Planning Division of TED together with the Management Division of TED and EPRD. Data will be gathered under the following headings:

(i) Internal Efficiency

- (a) student flows, admission rates, enrollments, gender participation rates, progression rates, dropout rates, repetition rates, pass/fail rates, and gradings
- (b) efficiency indexes, output/input ratios
- (c) staff load, student/staff ratios, average class size, and teacher workloads

(ii) Cost-Effectiveness and Unit Costs

total costs, numbers of students/graduates, annual costs per student/graduate, breakdown of school costs by budget categories

(iii) External Efficiency

tracer studies (reverse and longitudinal) and surveys of graduates and employers

(iv) Social impact

The above data will be broken down by gender, income groups, and geographic origin of student to facilitate the analysis of access, equity, and social and geographical mobility.

4. The monitoring of external efficiency of STSs will be based on tracer studies of samples of graduates and will cover such issues as their performance in further educational programs; time taken to find employment—both by those going on to higher education and by those entering employment direct from STSs; the type and level of employment and associated income levels; and the evaluation of education and skills by employers.

5. The use of the indicators outlined above will provide MOE and TED with information for the more effective monitoring of the STS system, and will facilitate the development of more effective short-, medium-, and long-term policies and plans for the improvement of the TVE subsector. In particular the data will provide important information on the placement of STS graduates, the efficiency and effectiveness of contextual learning and "smart" schools, future teacher training needs, and the system's ability to provide qualified graduates for further education and the labor market.

TECHNICAL ASSISTANCE FOR STRATEGIC REVIEW OF TECHNICAL EDUCATION AND SKILL TRAINING

A. Background

1. The continued rapid pace of economic, industrial, and technological development in Malaysia places new and rapidly changing demands on the country's technical education and skill training (TEST) system. Present shortages of semiskilled and skilled labor, the Government's policy of increasing the capital-intensity of production, and the need to support industry in its efforts to expand its research and development capability all highlight the increasing importance of the TEST system, including both public and private providers, in supporting economic development in the medium and longer term. Given the rapid pace of development, the increasingly costly and sophisticated skills required in industry, and Government efforts to streamline and rationalize the provision of public services and increase the involvement of the private sector in education, the overall provision of TEST will require strategic review prior to the finalization of the Eighth Malaysia Plan (8MP) covering 2001-2005 and the Third Outline Perspective Plan (OPP3) covering 2001-2020. The key issues facing the TEST system are summarized below.

2. The ability of the TEST system to meet labor market demand needs review. the labor market is marked by significant shortages of production workers and engineers, an influx of foreign workers to meet shortages, and the need for an increasingly flexible workforce. Future developments, including the economy's rapid expansion into knowledge-based and high-technology industries and such projects as the multimedia super corridor, will continue to place new demands on the system and will require increasingly demand-driven public and private TEST provision.

3. The scope for rationalizing TEST needs careful review. At present, TEST provision is the responsibility of numerous ministries and other Government agencies, private institutions, and enterprises. Formal TEST is the responsibility of the Ministry of Education (MOE); skill training is provided by the Ministry of Human Resources (MOHR) and several other ministries; skill standards and certification are coordinated by the National Vocational Training Council (NVTC), and legislation concerning the regulation of skill training is under preparation; and private sector involvement is promoted through the Human Resources Development Fund (HRDF). The comparative advantages and relative cost-effectiveness of different providers and regulatory mechanisms need review, as a basis for rationalizing and improving the overall efficiency of the TEST system.

4. Private sector participation in TEST needs to be further developed. Recent measures to strengthen the role of the private sector in TEST include the establishment of the HRDF in 1992 and the introduction of a new apprenticeship scheme. Several state governments have collaborated with the private sector to establish skill development centers in connection with industrial zones to meet directly the skill development needs of advanced industries. There is a need to review the scope for further enhancing these measures, and for additional measures such as further developing enterprise-based training, establishing additional incentives, and privatizing or corporatizing selected skill training institutions.

5. The ability of the TEST system to meet social demand also needs review. As the TEST system develops to meet the needs of increasingly advanced industries, it is important to ensure that TEST programs, and the educational and career paths to which they lead, reflect the needs of different regions, income groups, and social groups, including female students and workers. Among other things, the structure of formal technical and vocational programs and the development of a technical career path are under review. The links between TEST programs, the economy's dependence on foreign workers, and the objective of gradually reducing this dependence also need to be examined.

6. Finally, the staffing of TEST requires review, including (i) projected requirements for teaching staff, and the necessary qualifications; (ii) the rationalization of teaching staff in line with organizational developments, and the need for redeployment and retraining programs; and (iii) the further development of teacher and instructor training in line with technological and labor market developments, and the rapidly changing needs of industry and commerce.

B. Objective

7. The objective of the technical assistance (TA) is to assist the Economic Planning Unit (EPU) of the Prime Minister's Office in undertaking a strategic review of TEST as a basis for policy review and planning, including the preparation of the 8MP and OPP3.

C. Scope of Services

8. About 15 person-months of international and 20 person-months of domestic consultants will be needed to carry out TA activities. The consulting services include expertise in (i) TEST organization and policy (8 person-months, international); TEST financing (4 person-months, international); (iii) cooperation between TEST and industry (3 person-months, international); and (iv) TEST research, surveys and data (2 domestic consultants for 10 person-months each). The TA will emphasize close cooperation among international consultants, domestic consultants, and counterpart staff in EPU. The TA will finance the cost of the international consultants.

D. Cost Estimates and Financing Plan

9. The total cost of the TA is estimated to be \$824,000 equivalent, of which \$466,000 is the foreign exchange cost and \$358,000 equivalent is the local currency cost. The Bank will provide \$500,000 covering the entire foreign exchange cost and \$34,000 equivalent in local currency costs. The TA will be financed by the Bank on a grant basis from the Japan Special Fund, funded by the Government of Japan. It is proposed that the Government of Malaysia meet the remaining cost of \$324,000 equivalent, which represents expenditures (in cash or in kind) for domestic consultants, remuneration of counterpart staff, one national workshop, administrative support, office space, and transport. The detailed cost estimates are in Table 1.

E. Implementation Arrangements

10. EPU will be the Executing Agency for the TA. EPU will convene and chair a Steering Committee, which will be the primary counterpart to and support group for the consultant team. The team will work under the supervision of the Director, Social Services Section. The steering committee will comprise representatives from MOE, MOHR, Ministry of Youth and Sports (MOYS), Majlis Amanah Rakyat (MARA) under the Ministry of Entrepreneurial

Development, other relevant agencies, and the private sector. EPU will appoint qualified counterparts to work closely with the individual team members in the preparation of technical reports and will facilitate communication with responsible Government agencies. EPU will also provide office accommodation and administrative support, including secretarial support.

11. The TA will be implemented by an international consulting firm selected in accordance with the Bank's *Guidelines on the Use of Consultants*. The simplified technical proposal procedure will be used in the selection of consultants. Shortlisted firms will be requested to submit proposals that include the domestic consultants. However, the domestic consultants will be paid directly by the Government under a separate contract to be negotiated between them and the Government. The Government reserves the right to engage other domestic consultants, acceptable to the Bank and the selected international consulting firm, if satisfactory agreement cannot be reached with the domestic consultants initially included in the proposal submitted by the international consulting firm. The domestic consultants will be supervised by the international team.

12. The TA will be implemented over a period of approximately 10 months and will involve a process of close consultation among EPU, Government agencies, the private sector, and the consultants. The international consultants will carry out an initial two-month assignment to gather data and prepare survey instruments for the domestic consultants to gather detailed data on TEST policies and provision. The consultants will submit an inception report, including detailed work plans for all team members, at the end of the first month. Following a gap of one to two months, the international consultants will return to review the data and prepare the draft report for the national workshop. The draft final report will be completed by the end of the seventh month, and the workshop will be held during the eighth month. Following the national workshop, the consultants will finalize the report, incorporating comments from the Government and the Bank, for submission at the end of the TA. Tripartite review meetings, including representatives of the Government, the Bank, and the consultants, will be held during the first month, in connection with the national workshop, and one week prior to the completion of the TA. The proposed implementation schedule is given in Table 2.

F. Terms of Reference of Consultants

13. The consultants will map out specific roles and responsibilities in the provision of TEST; review key TEST issues and roles and responsibilities in the light of economic, technological, and industrial developments, rapidly changing labor market demand, and changes in relevant Government policies; and prepare issue papers and a draft report reviewing options for future strategies for discussion at a national workshop for key parties involved in TEST. Based on the workshop discussions, the TA will finalize the strategic review of TEST, providing background analysis and a balanced review of strategic options for rationalization and further development of TEST as an input to Government planning. The consultants will do the following:

- (i) Based on existing data, including data generated by the labor market information system supported by Bank-financed TA,¹ summarize anticipated future industrial and technological needs; labor market trends; and the need for technically educated, skilled, and semiskilled labor.

¹ TA No. 2713-MAL *Upgrading the Labor Market Information System*, for \$560,000, approved on 16 December 1996.

- (ii) Review existing policies, programs and institutional roles and responsibilities for TEST at all levels, including public institutions (MOE, MOHR, MOYS, MARA, and others), private institutions (state skill development centers and private schools), the apprenticeship program, enterprise training, and the HRDF; and prepare a detailed map of current and projected provision, including comparisons of different levels of provision. The review of TEST supply will include an analysis of gender participation, and possible bottlenecks and constraints.
 - (iii) Identify and review key issues and constraints that are expected to affect the provision of TEST into the 8MP and OPP3 periods, including (a) the implications of the gradual phasing out of vocational and skill programs in the secondary vocational and technical school (SVS/STS) system on the roles and responsibilities of other TEST providers; (b) the scope for overall rationalization of TEST provision; (c) the scope for expanding the private provision of TEST, including possible privatization or corporatization of selected skill training institutions; and (d) the operational effectiveness of the HRDF and the newly established apprenticeship scheme.
 - (iv) Prepare several issue papers reviewing the policy and program implications for the Government and other parties in the major areas, including (a) future public sector roles and responsibilities in TEST, including the possible rationalization of programs across agencies, cost reduction, and cost recovery; (b) strengthening private sector provision of TEST; (c) rationalizing and strengthening TEST financing, including the HRDF, the apprenticeship scheme, enterprise-based training, and other measures; and (d) strengthening cooperation between TEST institutions and industry, thus improving the efficiency of the system in meeting labor market needs. The issue papers and draft strategic review report will serve as the basis for discussion at a national workshop for concerned agencies from the public and private sector.
 - (v) Based on the workshop discussions and detailed review of the proposed strategic and policy options with the concerned parties, finalize a report on "Strategic Review of Technical Education and Skill Training: Options for the Future," which will serve as an input to policy review and planning, including the preparation of the 8MP and OPP3.
14. The responsibilities of the individual consultants are summarized below.
- 1. **Expert on TEST Organization and Policy** (8 person-months, international)
15. The expert will review the overall organizational and policy framework of the TEST system in the light of anticipated priority needs in the medium and longer term, and make recommendations regarding its further development and rationalization. Specifically, the expert will (i) serve as team leader and coordinate all TA activities, including the preparation and finalization of reports; (ii) provide the domestic consultants with detailed guidance on the data to be gathered and surveys to be carried out as a basis for the strategic review; (iii) review the demand for TEST, the supply of technically educated and skilled personnel from different sources, and the comparability of the output of the TEST system at different levels and from different institutions, and identify bottlenecks and constraints; (iv) review the national organizational and policy framework for TEST, including both public and private TEST providers,

and identify bottlenecks and constraints on efficiency; (v) review policies and institutional arrangements regarding teacher and staff training for TEST, identify constraints, and make proposals for its development to meet future needs; (vi) review the suitability of TEST curricula and programs to meet labor market needs and social demand, including the needs of different regions, income groups, and female students and workers; (vii) review relevant policies and proposals being prepared by the Government, including a draft skill training act and a proposal for the establishment of a technical career path; and (viii) make proposals for adjustments, strengthening, reorganization, and rationalization of the organizational structure of the TEST system and the respective roles and responsibilities of different public and private providers of TEST to enhance the efficiency of the TEST system in meeting anticipated needs for semiskilled, skilled, and technically educated personnel in the medium and longer term.

2. Expert on TEST Financing (4 person-months, international)

16. The expert will review financing arrangements for public and private TEST and make recommendations regarding the rationalization of financing arrangements, enhancing efficiency, and strengthening private financing for TEST. Specifically the expert will review (i) public financing of TEST to identify problems and constraints and make proposals for improving efficiency; (ii) the scope for increasing cost sharing or recovery in different public TEST programs and institutions through further development of such measures as production activities, time sector privatization, and the offering of for-fee training programs; (iii) the functioning of the HRDF and the scope for further expanding the industries and/or training programs under its coverage; (iv) the scope for privatizing or corporatizing selected skill training institutions; (v) the scope for developing tax and nontax incentives for preservice and in-service training; and (vi) other measures for strengthening TEST financing, and in particular private TEST financing.

3. Expert on Cooperation Between TEST and Industry (3 person-months, international)

17. The expert will review cooperation between TEST and industry, including enterprise-based and private TEST, and make recommendations regarding strengthening private sector involvement in TEST and enhancing the capability of the TEST system to meet the needs of the labor market. Specifically the expert will (i) review existing cooperation and links between different TEST providers and the labor market and industry, including school and institution-level cooperation, career guidance, and proactive use of labor-market information, and identify bottlenecks and constraints; (ii) review the apprenticeship program and enterprise-based training, and identify constraints; (iii) review experience gained in the private sector-led provision of TEST, including the state skill development centers and private schools; and (iv) propose appropriate policy and operational measures to strengthen cooperation between TEST and industry, including school-level linkages and cooperation, enterprise-based training, and the strengthening of private TEST.

4. Experts on Research, Surveys and Data on TEST (2 domestic experts, for 10 person-months each)

18. The domestic experts will work closely with the international experts throughout the TA period and will be responsible for gathering, processing, and analyzing data on different aspects of TEST and conducting surveys on strategic aspects of TEST as inputs to the strategic review. Under the guidance of the team leader, and with inputs from the other team members, the experts will (i) collate and analyze data on the demand for semiskilled, skilled, and

technically educated personnel from the labor market information system and other sources; (ii) map out in detail the current and projected provision of TEST by different public institutions, private institutions, the apprenticeship program, and enterprise-based training, including an analysis of gender participation; (iii) collate and analyze data on the placement of the graduate output of different TEST programs and institutions from existing sources including the labor market information system, the information systems of different TEST providers, and available tracer studies; (iv) collate data on past and present financing for public TEST programs under different Government ministries, private TEST programs, the apprenticeship program and the HRDF; (v) gather and analyze comparative data on the unit costs of different public and private TEST programs, and on the cost effectiveness of different programs to the extent possible with available data; and (vi) conduct surveys and studies, and gather such other data as are required to support the strategic review of TEST.

**Table 1: Cost Estimates for Technical Assistance for
Strategic Review of Technical Education and Skill Training
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Item	Foreign Exchange	Local Currency	Total Costs
A. Financed by the Bank (JSF)			
1. International Consultants			
a. Remuneration and Per Diem	370,000	-	370,000
b. International and Local Travel	30,000	-	30,000
c. Reports and Communications	-	10,000	10,000
2. Equipment ^a	-	15,000	15,000
3. Miscellaneous Administrative and Support Services	-	5,000	5,000
4. Representative for Contract Negotiations	5,000	-	5,000
5. Contingencies (about 15 percent)	<u>61,000</u>	<u>4,000</u>	<u>65,000</u>
Subtotal (A)	466,000	34,000	500,000
B. Government Financing			
1. Office Accommodation	-	12,000	12,000
2. Transport (in-city)	-	10,000	10,000
3. Remuneration and Per Diem of Counterpart Staff	-	75,000	75,000
4. Domestic Consultants			
a. Remuneration and Per Diem	-	155,000	155,000
b. Travel	-	5,000	5,000
5. Miscellaneous Administrative and Support Services	-	10,000	10,000
6. National Workshop	-	15,000	15,000
7. Contingencies (about 15 percent)	-	<u>42,000</u>	<u>42,000</u>
Subtotal (B)	-	324,000	324,000
Total	466,000	358,000	824,000

- = magnitude zero.

^a Five personal computers, one printer, and software.

