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STAFF APPRAISAL REPORT

FOURTH EDUCATION PROJECT

IN THE KINGDOM OF MOROCCO

March 19, 1979

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CURRENCY EQUIVALENTS
(September 1978)

Official Rate

US\$ 1.00 = Dirham (DH) 4.10

DH 1.00 - US\$ 0.24

Measures

1 m = 3.28 feet

1 m² = 10.76 square feet

1 km² = 0.38 square mile

1 hectare = 2.47 acres

Fiscal Year

January 1 to December 31

KINGDOM OF MOROCCO
STAFF APPRAISAL REPORT
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KINGDOM OF MOROCCO

Basic Data (1976)^{1/}

Total Population (1978)	18.8 million
Current Rate of Population Growth	3.0%p.a.
Per capita GNP (1977)	US\$570
Literacy Rate	about 28%
Primary School Enrollment as a Percentage of Age Group 7-11	65% ^{2/}
Lower Secondary School Enrollment as a Percentage of Age Group 12-15	21% ^{2/}
Upper Secondary School Enrollment as a Percentage of Age Group 16-18	11% ^{2/}
Higher Education Enrollment as a Percentage of Age Group 19-22	4% ^{2/}
Central Government Expenditures on Education as a Percentage of Total Government Expenditures	15.2%
Central Government Expenditures on Education as a Percentage of GNP	6.3%

^{1/} See Annex 1 for comparative educational data.

^{2/} Gross enrollment ratios.

I. THE EDUCATION SECTOR

Socio-Economic Background

1.01 Economic and social policies in Morocco in the 1960s were markedly conservative and led to slow economic growth and widening disparities in the distribution of income. New policy orientations emphasizing the equal importance of faster economic growth and a more equitable distribution of its benefits were set out in the 1973-77 plan. The plan called for export-led growth concentrated in the manufacturing and mining sectors and expansion of rainfed agriculture and tourism. A high target growth rate for GDP (real terms) of 7.5% p.a. was set for the plan period and actual achievement is expected to be 7.3% p.a. This rate is a significant improvement on the previous decade when growth averaged 3.6% p.a. in real terms. The plan also emphasized expansion of the social sectors, particularly education, and improvement in the distribution of income. Within the education sector, significant progress has been made with total enrollments increasing at over 8% p.a. in the plan period.

1.02. The interim plan for 1978-80, although reflecting less optimistic economic conditions, is expected to continue to emphasize economic growth and the distribution of its benefits. The export sector will again receive priority. However for the next few years, the social sectors will be subject to the constraints on public expenditure brought about by falling export prices (especially for phosphates), rising military expenditures and increased public debt service. Nevertheless the education sector will continue to receive high priority as indicated by its prominence in the 1978 budget.

1.03. The population of Morocco (estimated at 18.8 million in 1978) is distributed largely according to the dictates of topography and climate with most people occupying the cities and rich agricultural plains of the central and northwest regions. Population density in 1976 was estimated at 60-140 persons per km² in the four provinces of the north and west compared with about 15 in the three provinces of the south and east. Sparse population ensures that the provision of education facilities in the latter is both difficult and expensive, leading to inequalities in the distribution of educational opportunities (para. 1.14). Population is currently growing at the high rate of 3.0% p.a. and high fertility rates are expected to sustain this growth rate until the 1990s, thereby maintaining pressure on the education system for continued rapid expansion. Migration to the urban areas has continued at a significant rate with the urban population accounting for an estimated 40% of the total in 1978 compared with 29% in 1960. Migration overseas for employment has not been quantitatively significant according to available data with an average of around 23,000 workers departing per annum between 1973 and 1977. However, the economic impact of workers' remittances remains important -- estimated at over \$600 million in 1977. Although little is known about the skill structure of migrating Moroccans, present skill shortages are undoubtedly being exacerbated by the outflow.

1.04. Employment in Morocco increased at an estimated 3.4% p.a. during the plan period 1973-77 or at about the same rate as the growth of the labor force. Agriculture is still the major, though declining, source of employment, accounting for an estimated 47% of employment in 1977 compared with 67% in 1960. Employment growth in the secondary and tertiary sectors (estimated at 7.1% and 5.7% p.a. in 1971-77) was probably sufficient to stabilize the level of unemployment rather than reduce it in this period. Unemployment is estimated at around 10% with unmeasured but significant underemployment in the rural areas. Although the government has implemented some measures (land distribution, public works programs and assistance to handicrafts) aimed at reducing unemployment there has been a clear tendency to favor capital intensive methods of production. Investment incentives need to be changed to encourage labor intensive projects if the employment needs of a rapidly increasing population and a steady urban migration are to be met.

Education Development and Policy

1.05. Demographic factors have played an important role in the recent development of Morocco's education system. The high growth rate of population is resulting in an increasingly youthful population and the pressure of social demand has caused the education system to expand rapidly at all levels in recent years. During the period 1971-77 primary enrollments increased at 6% p.a., secondary enrollments at nearly 10% p.a., while enrollments in the universities increased 3.5 times. Gross enrollment ratios have now reached quite reasonable levels for a country at Morocco's stage of development, being 65% for primary (7-11 years), 21% for lower secondary (12-15 years), 11% for upper secondary (16-18 years) and 4% for higher education.

1.06. The enrollment targets of the 1973-77 plan have been exceeded in the primary and secondary schools, although in the latter the planned shift of enrollments from letters to math/science and technical courses has not been achieved. Enrollment targets in the teacher training colleges have also been exceeded although it now seems that primary teacher needs were underestimated and a rapid expansion of primary teacher training is planned in the next few years (para 1.10). Progress towards reducing repeater rates at the primary level has been slow and although secondary repeater rates are not appreciably above plan targets, they are nevertheless still high (para 1.13). Moroccanization of the primary teaching service has been achieved and it seems certain that lower cycle secondary will be fully moroccanized by the target year 1980.

1.07. Education policies for the future will continue to be directed towards long term goals namely:

- (a) the expansion of primary education to provide complete enrollment of the seven year age group by 1995;
- (b) arabization--the continued expansion of Arabic as the language of instruction, especially at the secondary level in science and technical courses;

- (c) moroccanization of the teaching service. This is complete at the primary level and it is planned to have the lower secondary level fully moroccanized by 1980;
- (d) the development of secondary and higher education to meet the country's needs for skilled manpower through the expansion of secondary technical education, higher institutes of technology and a greater orientation towards science and engineering in the universities;

1.08. Education is being given high priority in Morocco in accordance with its key role in the country's development. In general, educational policies have been soundly conceived and are relevant to long term objectives. Administration of the education system has been strengthened recently with the amalgamation of the Ministries of Primary and Secondary Education and Higher Education to form the Ministry of National Education and Training. This brings policy formulation for the whole formal education system under one minister who is served by two secretaries of state. The new ministry also contains a directorate of training, under strong leadership, which will coordinate the post-secondary training activities of other ministries. At the commune level, the policy of giving more responsibility for the management of primary schools to local government authorities will ensure a closer relationship between education and the social environment.

1.09. The problems of the education system (paras. 1.12-1.18) are well understood in Morocco, but their solution will be long term. The gradual generalization of primary schooling will progressively reduce inequalities of opportunity between sexes and regions, while arabization will reduce the language disadvantages now suffered by poorer children. More relevant curricula in primary and secondary schools, to be achieved through increased teaching of science and technical subjects, improved teaching aids and better qualified teachers will, in the long run, help to reduce repeater and dropout rates. Expansion of secondary technical schooling and higher technical and scientific education will increase the supply of crucially short skilled manpower.

1.10. However the pursuit of these policies will place an increasing burden on teacher training, particularly at the primary level and ultimately on the national budget. In 1977, there were only 4,500 students enrolled in primary teacher training colleges producing an output of around 2100 and this is highly inadequate in terms of teacher needs, estimated at 4,900 p.a. to 1990. This deficiency has been recognized by the government and the capacity of the primary teacher training system will be raised to 14,000 places by 1982. The supply of teachers at the lower secondary level is being met adequately by the system of regional teachers' colleges (enrollments 8,053 in 1977). Upper secondary teachers are drawn from university graduates who follow a one year teacher training course at the Ecole Normale Superieure (enrollments 219 in 1977). To increase supply, the government has introduced a special one-year course to upgrade teachers with suitable experience and

academic potential. ^{1/} A program for the construction of eight ecoles normales superieures is also currently under consideration with priority to be given to the training of math/science teachers in four year courses.

1.11. In terms of overall financial resources, education and training currently accounts for a high 6.3% of GNP and this level of effort is expected to be maintained to 1990 (para. 1.22). Clearly, the government will need to exercise a high degree of cost consciousness in the future and emphasize measures to reduce unit recurrent capital costs in order to keep the burden of education within acceptable limits.

Education Issues

1.12. While total enrollments at all levels have expanded rapidly in recent years, growth has been accompanied by significant qualitative problems. They are:

(a) Efficiency

1.13. Despite improvements in recent years repeater and dropout rates are still high. In the primary cycle, 31% repeat and nearly 6% drop out, while in secondary the rates are about 16% and 7% respectively. In 1977, 98,000 or 26% of grade 1 enrollments were repeaters while 13,000 or 12% were repeating grade 6. Thus about one in four primary places and one in eight secondary places normally available to new admissions were preempted by repeaters. Examination success rates are low with only 33% passing the secondary entrance exam and 44% receiving the baccalaureat. These qualitative deficiencies are caused by a number of factors including socio-economic pressures for early termination of schooling, irrelevant curricula and lack of textbooks and teaching aids and, at the primary level in particular, language problems and a shortage of qualified teachers. Within the university system the situation is even more serious with dropout rates of between 25% and 43% and repeater rates of 30%-53% for first year students. Only 30% of candidates received the licence in 1977.

(b) Equity

1.14. Marked disparities in educational opportunity by sex and region continue to exist. The proportion of girls enrolled in primary schools was only 36% of total enrollments in 1977, barely an improvement over the 33% recorded in 1970. At the same time, urban girls have a much better chance of entering school than their rural counterparts--46% of new primary enrollments in urban areas were girls compared with 23% in rural areas. Regionally, 39% of primary enrollments are female in the north-west while the proportion is only 19% in the southern region. At the secondary level girls accounted for only 35% of total enrollments in general secondary schools in

^{1/} The capacity of the special course is being increased under the third education project (Loan 1220-MOR) which is financing a training institution for 275 trainees.

1977 although this is an improvement over the 26% enrolled in 1970. Within technical secondary schools only 22% of enrollments are girls. Marked regional disparities by sex also occur at the secondary level with girls accounting for 38% of total enrollments in the north-west region compared with less than 20% in the southern region. In primary teacher training, female enrollment has reached 44% but declines to 22% in lower secondary teacher training. In the universities only 20% of enrollments are female.

(c) Language

1.15. The continued widespread use of French as the language of instruction together with the slow rate of arabization of the curriculum have posed serious problems within the school system. The introduction of French in grade 3 and its increasing use thereafter has raised learning difficulties for children from poorer homes who lack contact with the language outside the school environment. This in turn has contributed to increased repeater and dropout rates. Tardiness in producing textbooks and teaching aids in Arabic as well as teachers capable of teaching in the language have held up arabization in both primary and secondary levels, although in the former, the teacher service is fully moroccanized. At the secondary level, arabization has commenced in history, geography and philosophy but progress will continue to be hampered in science and technical courses by the lack of textbooks in Arabic and the high proportion of non-Moroccans (35%) in the teaching force.

(d) Relevance

1.16. Primary education has a strong literary bias which is similarly reflected in the secondary schools and universities. Thus the two-thirds of primary school leavers who do not enter secondary school have received an education which has scant relevance to life after school or the need to find gainful employment. About 60% of teaching time in the lower secondary cycle is devoted to letters but an attempt is being made to make learning more practical through the establishment of the "introduction to technology" course (para. 2.06). Within the upper cycle of the general secondary schools, 49% of enrollments are in letters compared with 47% in science and 4% in technical and commercial courses. At the universities, the pattern is much exacerbated with nearly 77% of students enrolled in law and arts compared with 9% in science and 1% in engineering. Over the past five years, 61% of graduates have come from the faculties of law and arts and if these trends continue Morocco will soon have a surplus of non-technical graduates posing future problems of high level underemployment and unemployment. To make the university system more relevant to the country's high level manpower needs, a substantial reallocation of resources is needed in favor of science and engineering courses.

(e) Manpower Training Problems

1.17. Shortages of skilled and experienced manpower in Morocco have acted as a serious constraint to economic and social development. At the higher levels shortages have been alleviated by the employment of large numbers of expatriates but this constitutes merely a temporary and costly expedient and

should not obscure the urgent need to develop local sources of manpower supply. Development of higher education has favored the universities, which in 1977 had enrollments of 45,000, rather than the higher institutes of technology (enrollment 6,000). Within the universities, as noted in para. 1.16, there exists a strong bias towards arts and law courses suggesting the need for a redirection of resources in favor of science and engineering courses in the universities and towards the non-university institutes of technology. The problem is recognized in current policies for the development of higher education which call for the establishment of four institutes of technology, two applied engineering institutes, a school of architecture, the extension to Mohammedia Engineering College and three faculties of science. It is not clear at this stage whether policies for the restructuring of university enrollments in favor of science/engineering courses will be at the expense of resources allocated to arts/law courses or whether these will continue to expand and additional resources made available for expansion in science and engineering. If the latter is intended, it will cause additional pressure on an already high education budget.

1.18. At the middle and lower levels, shortages are particularly crucial and the training infrastructure inadequate. Technical secondary schools enroll only one student for every 13 in general secondary schools. In the non-formal sector the artisanat training scheme covering 15 trades enrolls only about 4,000 trainees; training in Ministry of Labor vocational schools (8,200 enrollments including 3,600 in six month courses), health training (4,500), agriculture (1,500) and tourism (1,200) service the other major fields of middle and lower manpower demand and outputs from the system are estimated to meet only about one third of requirements. Apart from quantitative inadequacies, vocational training undertaken in different ministries suffers qualitative deficiencies resulting from a shortage of trained instructors and teaching materials and has lacked a coordinating mechanism comparable to the Directorate of Training recently established to serve this purpose for post-secondary training (para. 1.08). 1/ At the lowest level, pre-employment training in six month courses enrolls 3,600 trainees. These courses provide the first opportunity for training to those who may not have completed primary schooling but since even the simplest formal courses require at least some primary education, the 35% of the age group who do not attend primary school, together with older illiterates, are excluded entirely from future training opportunities. The need for literacy programs and expanded low level skill training is therefore an obvious priority. The 1973-77 plan called for the establishment of the National Bureau of Literacy within the Ministry of Education with an interministerial commission to coordinate its work. However the Bureau has not been established and the plan target of giving some literacy training to 2.5 million illiterates remains unmet.

1/ The situation is expected to improve following a recent decision to make the Ministry of Labor and Vocational Training responsible for coordinating all lower technical/vocational training.

Technical Manpower Requirements

1.19. The achievement of Morocco's hopes for a rapidly growing and modernizing economy rests to a great extent on the availability of skilled technical manpower. Reliance on expatriates to fill crucial gaps in manpower demand is both very costly and incompatible with the long term needs of a self-reliant economy and society. Technically trained Moroccans are needed in large numbers to fill high level technical posts, to assume managerial responsibility and at the middle level to meet the requirements for technicians to operate and maintain increasingly complex systems of production. The structure of the education system in Morocco does not serve well the country's needs for technical manpower. At the upper secondary and higher levels, enrollments are strongly biased in favor of non-technical courses and the accompanying table indicates clearly the highly inadequate supply of technical manpower at the present time. Education policies for the future emphasize strongly the need to develop middle and higher technical education and the fourth education project that is described in this report will make a significant contribution to this objective.

Manpower Requirements, 1977-90

Category	Annual Average Requirements 1977-90	Output from System 1977	Additional Annual Output from:	
			Proposed Project Institution	Institutions Proposed for 1978-82
Engineers				
5-year course	580	112	400 /1	
4-year course	1,160	275	190	190
Higher Technicians	4,400	407	550	550
Middle Technicians				
Industrial	11,700	1,499	2,180	
Commercial	13,500	3,906	1,020	
Technical Teachers	310	0 /2	240	

/1 This is the estimated output from an enrollment capacity of 2,200 at the Mohammedia Engineering College. The proposed project covers an expansion of the college to this capacity. Enrollments in 1977-78 were 535.

/2 At present there is no specific training in Morocco for technical teachers, 60% of whom are expatriates.

1.20. The inadequacy of basic data in Morocco has made estimates of future technical manpower needs difficult and figures should be regarded only as general orders of magnitude. Nevertheless the gap between estimated annual requirements and current output demonstrates the general dimension of the manpower shortage in Morocco. It is estimated that annual requirements for engineers in Morocco during 1977-90 will be 1,740 p.a. of which 580 will be "ingenieurs d'état" (five year course) and 1,160 "ingenieurs d'application" (four year course) compared with a current output for both categories of 387.^{1/} Requirements for higher engineering technicians in the same period are estimated at 4,400 p.a while outputs were only 407 in 1977. Middle level technical manpower requirements are expected to average 11,700 industrial technicians p.a. and 13,500 commercial technicians. Outputs of these categories in 1977 were 1,499 and 3,906 respectively.

1.21. The project institutions would make a significant contribution to the long term requirements for technical manpower in Morocco and an especially important contribution to the planned expansion of the higher education system. The extension to Mohammedia would raise its enrollment capacity from 535 to 2,200 and an annual output of around 400 ingenieurs d'état could be expected. The applied engineering college, with an estimated output of 190 p.a. is one of two to be established and current proposals also call for the establishment of four higher institutes of technology, the first of their kind under the Ministry of National Education. The project would finance two of these which together would graduate 550 higher technicians a year at full capacity. The 11 technical lycees would more than double current capacity and would eventually graduate 2,180 engineering technicians and 1,020 commercial technicians per year. The majority of graduates are expected to enter direct employment to ease the critical shortage of middle level technicians. The technical teacher training college would play a major role in supporting the expansion of technical education by providing 240 technical teachers a year or 77% of estimated annual average needs.

Education Finance

1.22. Expenditures on education in Morocco have reflected the rapid rate of growth of enrollments at all levels in recent years. Overall enrollments increased at around 8% p.a. between 1973 and 1977 and this educational effort has imposed an increasing burden on the economy with total public expenditure on education, as a proportion of GNP, rising from 4.2% in 1972 to 6.3% in 1976. Assuming that education continues to receive high priority in national development, current trends indicate that education will account for around the same proportion of GNP by 1990. Although the burden of educational expenditures is not expected to increase appreciably, it is nevertheless quite high for a country at Morocco's stage of development and it emphasizes the need for close control of educational expenditures. In 1973-77, recurrent costs in primary and secondary education rose at around 10.5% p.a. due mainly

^{1/} Output figures do not include Moroccan graduates of overseas institutions. In 1977 there were 773 Moroccans studying engineering and technical courses overseas.

to increases in teachers' salaries. There are clear opportunities for lowering unit costs through raising the relatively low internal efficiency of the school system. The government is expected to exercise close control over boarding and scholarship costs and teachers' salaries, which account for 85% of recurrent expenditures in primary and secondary education. Furthermore, substantial savings are expected to accrue through the moroccanization of the secondary teaching service which is currently 35% expatriate. The ongoing effort to improve school location planning will continue as a matter of priority and every effort will be made to reduce unit construction costs and ensure appropriate space standards in educational facilities.

Bank Strategy and Lending for Education

1.23. Growth, modernization and self-reliance within Morocco will place a particularly heavy responsibility on the education and training system to improve the general educational level of the population and especially to produce the skilled manpower required to achieve Morocco's long term development objectives. Education policies in Morocco have been directed towards these ends by emphasizing the generalization of primary education, moroccanization, arabization, and expansion of secondary and higher education to meet manpower needs. Nevertheless quantitative expansion has been accompanied by qualitative deficiencies especially in the form of low internal efficiency and lack of relevance of teaching to national needs (paras. 1.13 and 1.16).

1.24. Bank lending in the education sector (two credits and one loan) has been consistent with the government's objectives and the need to mitigate the problems of the education system. Lending has concentrated on: (a) expansion and qualitative improvement of secondary education as a basis for producing urgently needed manpower; (b) the expansion of teacher training in support of the policy of moroccanization; (c) the expansion of manpower training capacity in specific priority sectors (agriculture, health and tourism); and (d) support for more relevant and equitably distributed rural education through the construction of experimental primary schools in the most deprived rural areas. The first credit (79-MOR for US\$ 11 million) in 1965 provided for the construction and equipment of 21 secondary schools (three were later deleted) offering a mix of general academic and vocationally oriented short courses. The latter were never implemented following a government reform which abolished vocational courses in the formal education system and thus the impact of the project was reduced. There were also substantial delays in implementation due to poor project management in the early stages. Implementation was in the hands of part-time officials; weak decision making capability and cumbersome disbursement procedures also contributed to the delays. The situation steadily improved following the creation of a separate, permanently staffed project unit as specified in the second credit agreement.

1.25. The second credit (266-MOR for US\$ 8.5 million) in 1971 provided strong support for teacher training through the establishment of seven teacher training colleges and the qualitative improvement of science and technical teaching through the provision of science laboratories for 6 general secondary schools, and equipment for 10 technical and 13 commercial schools.

Construction and equipment were also provided in support of forestry training. Implementation of this project proceeded satisfactorily and is now complete. The third project (Loan 1220-T-MOR for US\$ 25 million) in 1976 continued support for manpower training in specific sectors (agriculture, health and tourism), secondary education and teacher training and also provided 47 primary schools with practically oriented curricula to increase educational opportunities and the relevance of primary schooling in rural areas. Implementation of this project is proceeding satisfactorily.

1.26. The proposed fourth education project concentrates on meeting Morocco's crucial needs for technicians and engineers and training technical teachers. This project is viewed as a specific effort in middle and higher technical education to relieve Morocco's severe shortages of technical manpower. Future lending is expected to emphasize lower level training needs for particular priority sectors (such as agriculture and health) and vocational training for industry with emphasis on skill upgrading for the poor. With regard to the latter, areas for future Bank lending will be identified in a study of lower level vocational and technical training being financed under the third project.

II. THE PROJECT

Introduction

2.01 The proposed project was prepared by the Moroccan government, in part by means of engineering studies financed under the third education project.^{1/} Bank pre-preparation missions visited Morocco in June and October 1977 and a Moroccan preparation mission came to Washington in November 1977. A Unesco mission assisted in project preparation in January 1978. The project (loan amount \$113 million) was appraised by Messrs. W.E. Rees (economist, mission leader), A. Andonyadis (architect), J.C. Jones (technical educator, consultant) and R. Dugre (engineering educator, consultant) during February 13 - March 10, 1978. The government presented a list of nine prepared items of which five were appraised in line with government and Bank priorities and the limit imposed by the estimated loan amount. Slow progress in design development necessitated further visits by the mission architect in November 1978 and January 1979 and has led to a considerable delay in finalizing project documents.

Objectives and Scope

2.02 The project is designed to increase the supply of (a) middle and higher technicians and engineers to meet Morocco's urgent demand for these manpower categories; and (b) technical teachers for the expanding system of technical lycees and for the "introduction to technology" program in

^{1/} The engineering studies were for five technical lycees, the technical teacher training college and the applied engineering institute.

the general lycees. The project institutions would be located in accordance with government policies for decentralized development and the need to disperse training opportunities among regional centers of development. The project would comprise:

(a) Construction, furniture and equipment for:

	<u>Grades</u>	<u>New Places</u>	<u>Estimated Annual Intake</u>	<u>Estimated Annual Output</u>
(i) 11 Technical lycees	10-12	10,160	3,330	3,200
(ii) Regional Technical Teacher Training Institute	13-15	660	250	240
(iii) 2 Higher Institutes of Technology	13-14	1,152	580	550
(iv) National Institute of Applied Engineering	13-16	768	200	190
(v) Extension to Mohammedia Engineering College	13-17	1,665	500	400

(b) Technical assistance related to (i) - (iv) above (20 man-years of experts and 1-1/3 man-years of fellowships).

(c) Technical assistance for the project implementation unit (8 man-years).

(d) Pre-investment designs for the preparation of a future education project.

(a) Technical Lycees

2.03 The project would provide for the construction and equipment of 11 technical lycees offering three-year industrial and commercial courses at the upper-secondary level (grades 10-12). Outputs are estimated at 2,180 industrial and 1,020 commercial technicians. The courses are designed with specific reference to the needs of industry and commerce for middle-level technicians and it is expected that a majority (85-90%) of graduates would seek such employment with the remainder entering higher technical education. Individual choice in this respect is likely to be influenced by the favorable employment conditions offered by industry and commerce and by the relative scarcity of bursaries and places in higher technical education. Entry to the technical lycee is open to those with good passing marks in appropriate subjects in grade 9. All courses are open to women but relatively few are expected to enroll in industrial courses. A much more significant female enrollment is anticipated in the commercial courses, especially those preparing for secretarial work. Boarding for about 6,000 students would be financed under the loan reflecting the need to serve students from poorer homes and to draw inputs from beyond the centers of population in which the institutions are to be located. These locations reflect both the government's policy

of decentralizing education/training opportunities in accordance with regional development needs and the specific regional needs of industry and commerce for technicians.

2.04 Curricula reflect the need for practical preparation of technicians and have an adequate balance between laboratory/workshop programs and theoretical studies. The industrial course offers four options (industrial production, design, electrotechnics and electronics) and in five schools an additional option in industrial chemistry is provided to reflect regional needs for technicians to serve the chemical industry. The commercial course offers options in accountancy and secretarial studies. The statute under which the technical lycees would be established requires the creation of advisory councils, representative of local industrial and commercial interests and the government will establish them within six months of the opening of the institutions. The councils would be responsible for ensuring the relevance of training to local labor market needs, the placing of students in employment training during vacations and career guidance. Councils would also be responsible for the management of funds raised from a training tax 1/ and used for the purchase of materials, maintenance of workshops and the payment of part-time teachers drawn from local enterprises.

2.05 An academic staff of about 80 would be needed for each technical lycee. Considerable reliance on expatriates recruited under existing bilateral agreements with France and Belgium would be necessary during the first years of operation until the outputs of the proposed technical teacher training college become available. Technical assistance (about 5 man-years) would be required for course/equipment specialists and a small number of fellowships to provide counterparts to these experts (para. 2.21).

(b) Regional Technical Teacher Training College

2.06 This institution would be established on a suitable site at Mohammedia and would serve two purposes: (a) to train teachers for the "introduction to technology" course in the lower cycle of general secondary schools and (b) to train teachers for the expanding system of technical lycees. The introduction to technology course was instituted during the 1973-77 plan as part of the policy to place greater emphasis on science and technology in general secondary education. Teaching of the course is currently restricted by the availability of only 116 technology teachers who have been trained in temporary facilities at Casablanca. It is intended that the course be extended to all general secondary schools to provide two hours of instruction per week in each of the four years of the lower cycle. For technical lycee teachers, no formal training currently exists in Morocco. Of the present stock of nearly 600 technical teachers, about 60% are expatriates and the Moroccan teachers are drawn directly from industry or from university graduates who have completed a one-year course at the Ecole Normale Supérieur. Almost all of the latter teach the basic math/science courses.

1/ The training tax is levied at a rate of 1% of payroll on enterprises with more than 10 employees.

2.07 The proposed training college would provide a two years course for lower cycle technology teachers and a three years course for upper cycle technical lycee teachers. The two-year course would enroll 180 students who would follow a well-balanced program covering technical and general subjects and teaching methods. The three-year course would enroll 480 students who would take a year's common course followed by specializations in one of the six options offered in the technical lycees (para. 2.04).^{1/} Entry to both courses would be by means of an entrance exam for holders of an appropriate baccalaureate. All courses and options would be open to women but it is expected that significant female enrollment would be achieved only in the secretarial option. An advisory council would be established with appropriate industry representation. Boarding for 450 students would be financed under the loan.

2.08 At full capacity the training college would graduate about 85 technology teachers which would allow for the steady expansion of enrollments in the introduction to technology course. Annual outputs of around 155 technical teachers would be sufficient to staff two or three new technical lycees per year and in addition would allow for the progressive replacement of expatriates. For the training college itself, 83 academic staff would be required including about 60 expatriates. Technical assistance (5 man-years) would be needed for course/equipment specialists during the start-up period in 1983-84.

(c) Higher Institutes of Technology

2.09 The proposed project would finance two higher institutes of technology to provide a two year course for higher engineering technicians. The institutes would be located at Casablanca, Morocco's largest industrial city and at Fez, a center for the textile industry which is also near the oil and sugar refining industries located around Sidi Kacem. Each institute would enroll 576 students and offer specializations in mechanical, electrical, electronic, civil and chemical engineering. Curricula adequately reflect the needs of industry and provide an acceptable balance between practical and theoretical studies. Entry to courses would be by examination open to suitable baccalaureates. All courses would be open to women and a target female enrollment of 20% has been set. However this target is unlikely to be met in the first few years of operation in view of the present low level (3.7%) of female enrollment in similar courses. Boarding for 432 students in each institute would be financed under the loan.

2.10 At full capacity, each institute would require 56 academic staff recruited entirely from Moroccan sources. Technical assistance (5 man-years) would be required only for course/equipment specialists during the start-up period in 1983-84. Part-time faculty drawn from industry are expected to play an important teaching role and serve to develop links with local enterprises. These links would be further strengthened by the creation of an advisory council for each institution with strong industry representation.

^{1/} No specific training is offered for industrial chemistry because the number of teachers is small and would be drawn from industry or the universities.

(d) National Institute of Applied Engineering

2.11 The National Institute of Applied Engineering would provide a four year program for "ingenieurs d'application". These are engineers with a practical orientation who are closely involved in the production process and supervise the work of technicians. Their training must provide technical knowledge and skills combined with sufficient theoretical knowledge to implement decisions and make independent judgments in an operational setting. The ingenieur d'application provides the link in the technical manpower structure between the research/design engineer (ingenieur d'Etat) and the practical work undertaken by higher and middle technicians. The program would extend over eight semesters of sixteen weeks, each of 32 hours. It would offer a common first year followed by engineering specializations in civil, electrical, mechanical and metallurgy. Curricula are well balanced between basic sciences, socio-economic and technology subjects, the latter constituting 67% of the program. Entry to the program would be open to scientific and technical baccalaureates and persons with equivalent qualifications. The goal for female enrollment has been set at 20%, but it is unlikely to be achieved in the first few years of operation. Boarding for 768 students would be financed under the loan.

2.12 The Institute would be located at Casablanca on a suitable site capable of future expansion. When fully operational the Institute would require 74 faculty recruited entirely from Moroccan sources. Technical assistance (5 man-years) would be needed for course/equipment specialists during the start-up period in 1983-84. It is expected that part-time faculty drawn from industry and government agencies in Casablanca would make an important practical contribution to the teaching program and links with these sectors would be further strengthened by the appointment of an advisory council with strong industry representation.

(e) Mohammedia Engineering College Extension

2.13 The Mohammedia Engineering College was established in 1960 to provide a three year engineering diploma. The program was upgraded to a four-year ingenieur d'application degree in 1962 and further upgraded in 1970 to provide a five year ingenieur d'Etat program. The ingenieur d'Etat is a full professional engineer whose training is oriented towards design, planning, research and management. Training for this role must impart a high degree of technical and theoretical knowledge as well as an understanding of socio-economic and environmental issues to develop a broader viewpoint and enable the engineer to make decisions that extend beyond purely technical considerations. Additional specializations or options are not envisaged in the proposed expansion of enrollments at Mohammedia. The site for the extension is part of the existing campus. The existing buildings will accommodate the two year common course forming a school of basic studies (plus the College administration) and the extension will accommodate the four specialist departments. Additional boarding accommodation would be provided by the Government.

2.14 The five-year program at Mohammedia extends over 10 semesters of 15 weeks, each of 32 hours and offers four engineering specializations (civil, electrical, mechanical and mining) with 12 options. Curricula are well balanced providing for a common course during the first two years which emphasizes mathematics, science and languages. Specializations in the last three years are well-adapted to actual engineering practice and include social science and management subjects. Entry to the course is by means of a selection committee process open to scientific and technical baccalaureates and others with equivalent qualifications. The goal for female enrollment is 20% and on current trends this seems feasible; females comprised 13% of enrollments in first year in 1977-78.

2.15 Mohammedia currently has an enrollment of 535 and it is proposed under the project to expand enrollment capacity to 2,200. This is the major institution training ingenieurs d'Etat in Morocco and 67 are expected to graduate in 1978. This compares with annual average requirements of 580 p.a. in the period to 1990. When fully operational, Mohammedia is expected to produce 400 graduates thus accounting for 70% of long term annual requirements. Mohammedia would require a high-quality faculty of 275 (including about 100 expatriates) when fully operational compared with the current figure of 54. No Bank financed technical assistance is required for this project item.

Evaluation System

2.16 To assist in ensuring that the outputs of the project institutions would be adequately trained in relation to industry's needs and would secure employment in jobs for which they had been trained, a tracer system would be established for each institution. In addition, the tracer systems would contribute to improving vocational guidance, career evaluation and curriculum development in the longer term. The government has agreed to operate the tracer systems from the opening of each institution and to submit details of these systems to the Bank at least 12 months before the opening of the new institutes, to permit review and comment and that results of the tracer studies would be forwarded to the Bank for five years following the first outputs from the institutions, as required for project evaluation.

Teacher Requirements

2.17 Moroccanization of the teaching service is a long term objective which is planned for completion in about 10 years. In the meantime, sufficient numbers of expatriate teachers would continue to be recruited under existing bilateral aid arrangements with France and Belgium. The government foresees no difficulty in meeting teacher needs for the project institutions under the bilateral arrangements. These are of long-standing duration and work efficiently to supply a significant proportion of the teaching force in secondary and higher education in Morocco. In 1976-77 there were nearly 6,200 French teachers in the general secondary schools, over 400 in the universities (excluding an unknown number of short term visiting academics), with perhaps another 500 in the technical schools and institutes.

2.18 The proposed project institutions would require about 1,470 teachers at full capacity of which about 700 would be expatriate. The bulk of these requirements would be accounted for by the technical lycees which would need about 900 teachers including about 550 expatriates. Moroccan teachers of basic science and math courses in the technical lycees would be drawn from the universities and limited numbers of teachers of technical subjects recruited from industry and government. From 1986 onwards, outputs from the proposed technical teacher training college would make an increasing contribution to staffing the technical lycees. In addition, fellowships would be offered to train Moroccan teaching staff for the post-secondary project institutions and these would be financed under existing bilateral agreements.

2.19 The government has prepared a staff development plan for each institution which identifies the numbers of local and expatriate teaching and administrative staff that will be required each year during the first ten years of operation, together with the numbers and types of fellowships that would be requested per year from bilateral sources. In addition, the government has provided an assurance that the required expatriate teachers and fellowships, consistent with the staff development plans agreeable to the Bank, would be given the highest priority in the government's requests to bilateral agencies for assistance during the period of these staff development plans or until the relevant institution's staff is completely moroccanized, whichever is earlier.

Technical Assistance

2.20 Bank financed technical assistance for the project would be required (a) for the project institutions (with the exception of Mohammedia) during the crucial start-up period; and (b) for the project implementation unit to strengthen its technical staff. A total of 28 man-years of experts and 1-1/3 man-years of fellowships would be needed. Details of the technical assistance program are shown in Annex 1, Table 2.1.

2.21 For the institutions the main need (20 man-years) is for course/equipment specialists to supervise the installation of equipment and ensure adequate training of local technical staff in the operation and maintenance of equipment. The experts would also be required for the preparation of workshop and laboratory teaching programs. In general the experts would be needed for a period of 16 months each commencing about six months before the start-up date and remaining for a full academic year. To establish a permanent group of experts in equipment maintenance for the technical lycee system, 16 man-months of fellowships would be required to train four Moroccans abroad in association with the experts.

2.22 In order to handle the additional heavy workload related to the administration and supervision of designs and construction of the proposed project, the technical services of the project implementation unit would be strengthened through the employment of an expert engineer and an expert architect until completion of the project. Two Moroccan engineers, an architect and two technicians have been recruited as counterpart staff.

A small amount of short-term expert services for the unit (about 1-1/2 man-years) which would be required for refinement of equipment lists and specifications would be supplied by experts recruited under the third education project.

Pre-investment Designs

2.23 The project would finance pre-investment designs for the development of a standard workshop design for rural primary schools, secondary teacher training colleges which would focus on science training and a proposed national center for coordinating and planning scientific and technological research.

III. PROJECT COST, FINANCING, IMPLEMENTATION AND DISBURSEMENTS

Cost of the Project

3.01 The total cost of the project is estimated at DH 887.7 million or US\$216.6 million equivalent. The estimated total cost and foreign exchange components by main project items are summarized below:

	<u>DH Millions</u>			<u>US\$ Millions</u>			<u>% of Baseline Cost</u>
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	
Construction, furniture & equipment for:							
11 technical lycees	169.9	188.1	358.0	41.4	45.9	87.3	57.3
A regional technical teacher training college	13.8	14.4	28.2	3.4	3.5	6.9	4.5
2 higher institutes of technology	34.6	37.5	72.1	8.4	9.2	17.6	11.6
A national institute of applied engineering	24.0	32.6	56.6	5.9	7.9	13.8	9.1
Extension to the Mohammedia Engi- neering College	46.4	48.2	94.6	11.3	11.8	23.1	15.2
Pre-investment designs	6.4	1.3	7.7	1.6	0.3	1.9	1.2
Technical assistance for:							
Experts & fellowships	1.0	4.0	5.0	0.2	1.0	1.2	0.8
Strengthening the project implementa- tion unit	0.4	1.6	2.0	0.1	0.4	0.5	0.3
Baseline cost	<u>296.5</u>	<u>327.7</u>	<u>624.2</u>	<u>72.3</u>	<u>80.0</u>	<u>152.3</u>	<u>100.0</u>
Contingencies:							
Physical	29.6	32.5	62.1	7.2	7.9	15.1	9.9
Price increase	98.9	102.6	201.5	24.1	25.1	49.2	32.3
Subtotal	<u>128.5</u>	<u>135.1</u>	<u>263.6</u>	<u>31.3</u>	<u>33.0</u>	<u>64.3</u>	<u>42.2</u>
Total project cost	<u>425.0</u>	<u>462.8</u>	<u>887.8</u>	<u>103.6</u>	<u>113.0</u>	<u>216.6</u>	

3.02 A breakdown of estimated project costs into local and foreign cost elements by categories of expenditure is summarized below:

	DH Millions			US\$ Millions			% of Baseline Cost
	Local	Foreign	Total	Local	Foreign	Total	
Construction:							
Academic & communal facilities	153.1	98.0	251.1	37.4	23.8	61.2	40.2
Boarding	49.0	31.3	80.3	12.0	7.6	19.6	12.8
Staff housing	6.7	4.2	10.9	1.6	1.1	2.7	1.8
Site development	31.3	20.0	51.3	7.6	4.9	12.5	8.2
Subtotal	240.1	153.5	393.6	58.6	37.4	96.0	63.0
Professional Services:	29.6	6.1	35.7	7.2	1.5	8.7	5.7
Furniture:	9.9	23.2	33.1	2.4	5.7	8.1	5.3
Equipment:	15.5	139.4	154.9	3.8	34.0	37.8	24.8
Subtotal	25.4	162.6	188.0	6.2	39.7	45.9	30.1
Technical Assistance:	1.4	5.5	6.9	0.3	1.4	1.7	1.2
Baseline Cost	296.5	327.7	624.2	72.3	80.0	152.3	100.0
Contingencies:							
Physical	29.6	32.5	62.1	7.2	7.9	15.1	9.9
Price increase	98.9	102.6	201.5	24.1	25.1	49.2	32.3
Subtotal	128.5	135.1	263.6	31.3	33.0	64.3	42.2
Total project cost	425.0	462.8	887.8	103.6	113.0	216.6	

3.03 Basis of Cost Estimates. Estimated civil works costs for the proposed project items are based on unit prices derived from current contracts and detailed cost analysis of completed components of the second education project, adjusted to reflect cost differences among the various regions. Furniture and equipment costs are based on current CIF unit prices and adjusted upward to include local transportation and installation. Cost estimates do not include any identifiable import duties. Costs of the technical assistance components are based on prevailing international remuneration of specialists and cost of fellowship training abroad.

3.04 Contingency Allowance. The project cost includes a contingency allowance for unforeseen physical additions equal to 10% of the estimated cost of civil works, furniture and equipment and professional fees, and 5% of the estimated cost of technical assistance. The project cost also includes price escalation contingencies calculated for the period beginning October 1, 1978 and in accordance with an agreed schedule of implementation. In view of

differences in prevailing rates of price escalation for local costs and international market prices, escalation contingencies were estimated separately for local and foreign costs. Price escalation percentages per year for each component of the project are listed at the bottom of Annex 1, Table 3.2. Prices are expected to increase during the project implementation period by a weighted total of about 32% for civil works, 31% for furniture, 38% for equipment, 14% for professional fees and 22% for technical assistance. Accordingly, total price increases are estimated at about 32% of baseline cost and about 23% of total estimated project cost, including contingencies.

3.05 Foreign exchange component. The estimated foreign exchange component is US\$113.0 million equivalent or 52.2% of total project cost. The calculations of the foreign exchange component are based on the expectation that: (a) all civil works contracts and professional services will be awarded to local or locally established mixed firms; (b) all equipment will be of foreign origin and about 90% will be imported directly; (c) about one-half of the furniture will be awarded to foreign suppliers; and (d) all technical assistance will be provided from foreign sources. The resulting foreign exchange content of each category of expenditure is as follows: (i) civil works 39%, (ii) furniture 70%, (iii) equipment 90%, (iv) professional fees 17%, and (v) technical assistance 80%.

3.06 Project financing. The proposed loan of US\$113.0 million would finance 100% of the total estimated foreign exchange cost of the project. The balance of total project costs would be financed by the government. The proposed financial plan is summarized below:

	<u>Government</u>		<u>IBRD</u>		<u>Total</u>
	<u>US\$</u> <u>Million</u>	<u>% of</u> <u>Financing</u>	<u>US\$</u> <u>Million</u>	<u>% of</u> <u>Financing</u>	<u>US\$</u> <u>Million</u>
Construction	58.6	61	37.4	39	96.0
Furniture	2.4	30	5.7	70	8.1
Equipment	3.8	10	34.0	90	37.8
Professional fees	7.2	83	1.5	17	8.7
Technical assistance	<u>0.3</u>	20	<u>1.4</u>	80	<u>1.7</u>
Baseline cost	72.3	48	80.0	52	152.3
Contingencies:					
Physical	7.2	48	7.9	52	15.1
Price increase	<u>24.1</u>	48	<u>25.1</u>	52	<u>49.2</u>
Subtotal	<u>31.3</u>	49	<u>33.0</u>	51	<u>64.3</u>
Total project cost	<u>103.6</u>	<u>47.8</u>	<u>113.0</u>	<u>52.2</u>	<u>216.6</u>

Recurrent Costs

3.07 When the project institutions are fully operational their recurrent costs are expected to be about Dh 76 million annually, corresponding to about 1.7% of projected public recurrent expenditure on education in 1986. In view of the high priority of the proposed project, the government can be expected to meet these expenditures.

Implementation

3.08 According to the agreed implementation schedules (Annex 1, Chart 2), the physical aspects of all project items with the exception of the extension to the Mohammedia Engineering College, would be completed by September 1983. The latter is scheduled for completion during June 1984. The technical assistance program would continue through June 1984. In order to allow sufficient time for submission of final withdrawal applications for the last parts of the project, the Closing Date would be December 31, 1984.

Administration

3.09 The project would be implemented by the Project Implementation Unit (PIU) of the Ministry of Education, which is also responsible for the second education project and the Ministry's items in the third project. The PIU is operating efficiently and implementation of ongoing projects is proceeding satisfactorily. However, the additional heavy workload related to the proposed project would require strengthening the staff of the Unit and the government has agreed to technical assistance financing in the proposed project for (i) an expert mechanical/electrical engineer for five years; and (ii) an extension of employment of the expert architect presently financed under the third loan or of a substitute agreeable to the Bank for the entire implementation period of the project, i.e. for three years. Financing of a total of eight manyears of experts is therefore included in the project. In addition short-term consultants in civil, electrical and mechanical engineering, financed under the third loan but not yet utilized, would be used to assist in preparation of equipment lists, specifications and installation details of equipment in the workshops and laboratories. The PIU has been further strengthened by the recruitment of an additional Moroccan architect and two engineers, to be financed by the Government.

3.10 Pedagogical and administrative inputs would be provided by the director of each institution and in the meantime an official of the Ministry of Education is acting as interim representative of the institution until the director is appointed. The director of Mohammedia Engineering College has already been appointed and is providing valuable inputs for that institution. The Directorate of Secondary and Technical Education has designated the interim representative for the group of 11 technical lycees until the directors are appointed. The Government has given assurances that directors of the new project institutions would be appointed at least 12 months before scheduled opening dates and heads of departments for the technical teachers' college, the institutes of technology and the applied engineering institute, within nine months following opening dates.

Architects and Preliminary Designs

3.11 The Government has selected consultant architects and engineers, acceptable to the Bank, for the design and supervision of the project institutions which were not among the institutions whose preparation was financed under the third project. The Government has agreed that special budgetary provisions would be made to finance the cost of these consultants until the loan becomes effective. Preliminary designs for each project institution were reviewed during appraisal and it was agreed that they would be modified in accordance with the appraisal mission's recommendations. Modified preliminary architectural designs and engineering studies for the five technical lycees, the technical teacher training college and the national institute of applied engineering have been satisfactorily completed. Similar designs and studies for the other institutions will be submitted in May 1979 with the exception of those for Mohammedia Engineering College which are expected in July.

Sites

3.12 Suitable sites for all project institutions have been acquired and detailed topographical surveys have been completed.

Bank Review and Approvals

3.13 Refinement of preliminary equipment lists is underway and final lists are scheduled for completion in early 1980. The government has agreed that bid documents would require suppliers to provide training of key personnel during installation in the use and maintenance of sophisticated equipment. An assurance has been given that an appropriate plan for equipment maintenance would be prepared for the project institutions and forwarded for Bank review within one year after the opening of the institutions.

Procurement

3.14 Civil works contracts (amounting to US\$136.1 million including contingencies) would be awarded on the basis of international competitive bidding. Civil works contracts of less than US\$200,000 equivalent, supplementary to main contracts, would be awarded on the basis of local competitive bidding procedures which are acceptable to the Bank. The total contract amount to be awarded under the latter procedures would not exceed an aggregated amount of US\$5.0 million. It is anticipated that due to the dispersion of the project institutions within the country and the well developed state of the construction industry, all civil works contracts would be awarded to local or mixed firms.

3.15 Equipment and furniture items (amounting to US\$67.5 million including contingencies) would be grouped, to the extent possible, in large packages to permit bulk procurement. Contracts for furniture and equipment in excess of US\$50,000 would be awarded on the basis of I.C.B. Small items or groups of items estimated to cost less than the above figure or items of specialized nature for which I.C.B. would not be practical, would be procured under normal

government procedures which are satisfactory to the Bank, and would include, to the extent possible, quotations from at least three manufacturers or suppliers; these items would not exceed an aggregate total of US\$4.0 million. Draft procurement documents for furniture, equipment and civil works would be forwarded to the Bank for review and approval; Bank approval of tender evaluation documents would be required prior to the award of all contracts under I.C.B. Bank reimbursement for all other contracts would be contingent upon Bank approval of tender evaluation documents subsequent to contract awards.

Disbursements

3.16 Disbursements (Annex 1, Table 3.3) would be on the basis of:

- (i) Civil works: 39% of total expenditure;
- (ii) Furniture and equipment: (a) 100% of foreign expenditure for directly imported items, (b) 85% of local expenditures for locally procured imported items, and (c) 50% of total expenditures for locally manufactured items;
- (iii) Professional services: 17% of total expenditures;
- (iv) Technical assistance: 100% of foreign expenditures or 80% of local expenditures.

3.17 These percentages, which correspond to the estimated foreign exchange content of each category above, would be adjusted if required to assure continued financing from the available loan funds for the period of implementation.

IV. BENEFITS AND RISKS

Benefits

4.01 The main benefits expected to accrue from implementation of the proposed project are as follows:

- (i) a significant annual addition to the supply of skilled manpower (590 engineers, 550 higher technicians and 3,200 technicians) to help meet urgent manpower needs and allow for the progressive replacement of expatriate specialists in line with the government's policy of rapid growth, modernization and self-reliance;
- (ii) the establishment of the first Moroccan institution for training technical teachers thereby supporting the expansion of the technical lycee system and allowing for the moroccanization of the technical teacher service, currently 60% expatriate;

- (iii) provision for training of teachers for the "introduction to technology" course in lower secondary schools which aims at improving the relevance of the secondary curriculum to the modern environment;
- (iv) improving the regional distribution of training opportunities and strengthening the links between training institutions and regional industrial centers.

Risks

4.02 Although the proposed project is large it is relatively homogeneous, focussing as it does on middle and higher technical education. Furthermore, project institutions are all under the control of the Ministry of National Education and Training which has an experienced project implementation unit. The unit has completed the second education project and is successfully implementing the Ministry's components of the third project. However the unit needs to be strengthened to cope with the additional workload of the proposed project (para. 3.09) and the maintenance of an experienced and competent staff would be essential for the efficient implementation of the project.

4.03 The technical lycees proposed under the project were conceived as providing practically oriented programs which would fit graduates for direct employment as middle level technicians. The government considers that while this principle is sound enough and justified in terms of manpower requirements, a proportion of the outputs from technical lycees should be allowed to proceed to higher technical education in order to satisfy the needs of the more academically inclined students and to ensure the prestige of the lycees as suppliers of candidates to higher education. The Bank has no objection to this view providing the focus on the supply of technicians for industry and commerce is maintained and a substantial majority of the output finds direct employment. The government has indicated that limitations on bursaries and places in higher institutions would keep the proportion proceeding to higher education at around 10-15% of the annual graduating class. Pressures for entry to higher education can be anticipated and there is some risk that the expectations and inclinations of students, parents and teachers may diminish the emphasis on job preparation which is the *raison d'etre* for the technical lycees. The situation would be closely monitored by means of the proposed tracer system (para. 2.16).

4.04 The project institutions would rely heavily on expatriate teachers when they become operational and it is estimated that about 700 expatriates would be needed. Although this represents a substantial recruitment effort, it is considered feasible in view of the large-scale and efficient program which has been implemented over many years between Morocco and France (para. 2.17). Recruitment would be facilitated by the special relationship between the two countries, which is particularly strong in the field of education. Nevertheless, such a large program would require sound management to ensure timely recruitment of suitably qualified expatriates. Prospects for the successful implementation of this recruitment plan have been improved by the formulation of a long range staff development program for each institution (para. 2.19) which identifies the numbers and types of expatriate teaching staff required each year during the first ten years of operation.

LIST OF CRITICAL ACTIVITIES

	5 Technical Lycees Technical Teacher Training College National Institute Applied Engineering		6 Technical Lycees Institutes of Technology		Mohammedia Extension	
<u>Civil Works:</u>						
Completion of site acquisition	February	1978	April	1978	March	1978
Completion of architectural design development drawings	February	1979	May	1979	July	1979
Completion of construction & bid documents	November	1979	February	1980	June	1980
Commencement of construction	September	1980	January	1981	April	1981
Completion of construction	March	1983	June	1983	March	1984
<u>Furniture and Equipment:</u>						
Completion of master lists & layouts	March	1979	March	1979	October	1978
Completion of preparation of final equipment lists with complete specifications	December	1979	March	1980	February	1980
Completion of installation of major equipment	June	1983	August	1983	June	1984
Completion of supply of furniture	June	1983	August	1983	June	1984
<u>Staffing:</u>						
Appointment of Directors of						
1) Technical Lycees	October	1982	October	1982	--	
2) TTTC National Institute of Applied Engineering Institutes of Technology	October	1982	October	1982	--	
Appointment of department heads in:						
TTTC National Institute of Applied Engineering Institutes of Technology	June	1984	June	1984	--	
<u>Bank Financed Technical Assistance:</u>						
Submission of program for Bank review	December	1980	December	1980	--	
Commencement of Program:						
Fellowships	December	1982	December	1982	--	
Experts	April	1983	April	1983	--	
Project Unit:						
Appointment of engineer	July	1979				

V. AGREEMENTS REACHED AND RECOMMENDATION

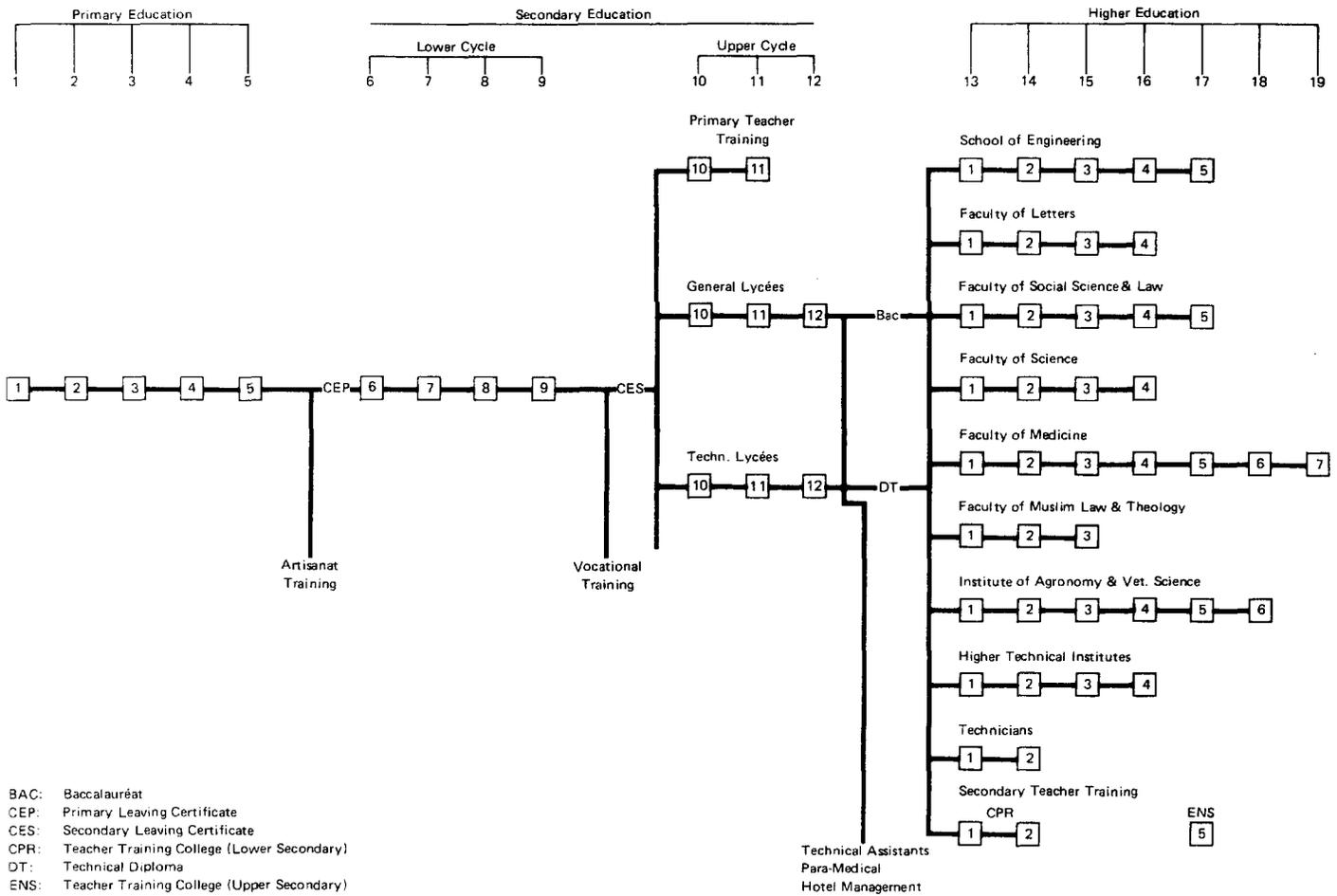
5.01 During negotiations agreement was reached on the following main points:

- (i) advisory councils with strong industry representation would be established for each new project institution within six months after opening date (paras. 2.04, 2.07, 2.10, 2.12);
- (ii) tracer systems to evaluate the pedagogical results of the project would be established for each project institution and details of these would be made available to the Bank for review at least 12 months before scheduled opening (para. 2.16);
- (iii) the required expatriate teachers and fellowships for the institutions would be given the highest priority in the government's requests to bilateral agencies for assistance during the period of the staff development plans (para. 2.19);
- (iv) directors of the new project institutions would be appointed 12 months before scheduled opening (para. 3.10); and
- (v) bid documents would require suppliers to provide training of key personnel during installation in the use and maintenance of sophisticated equipment; an appropriate plan for equipment maintenance would be prepared for the project institutions and forwarded for Bank review within one year after the opening of the institutions (para. 3.13).

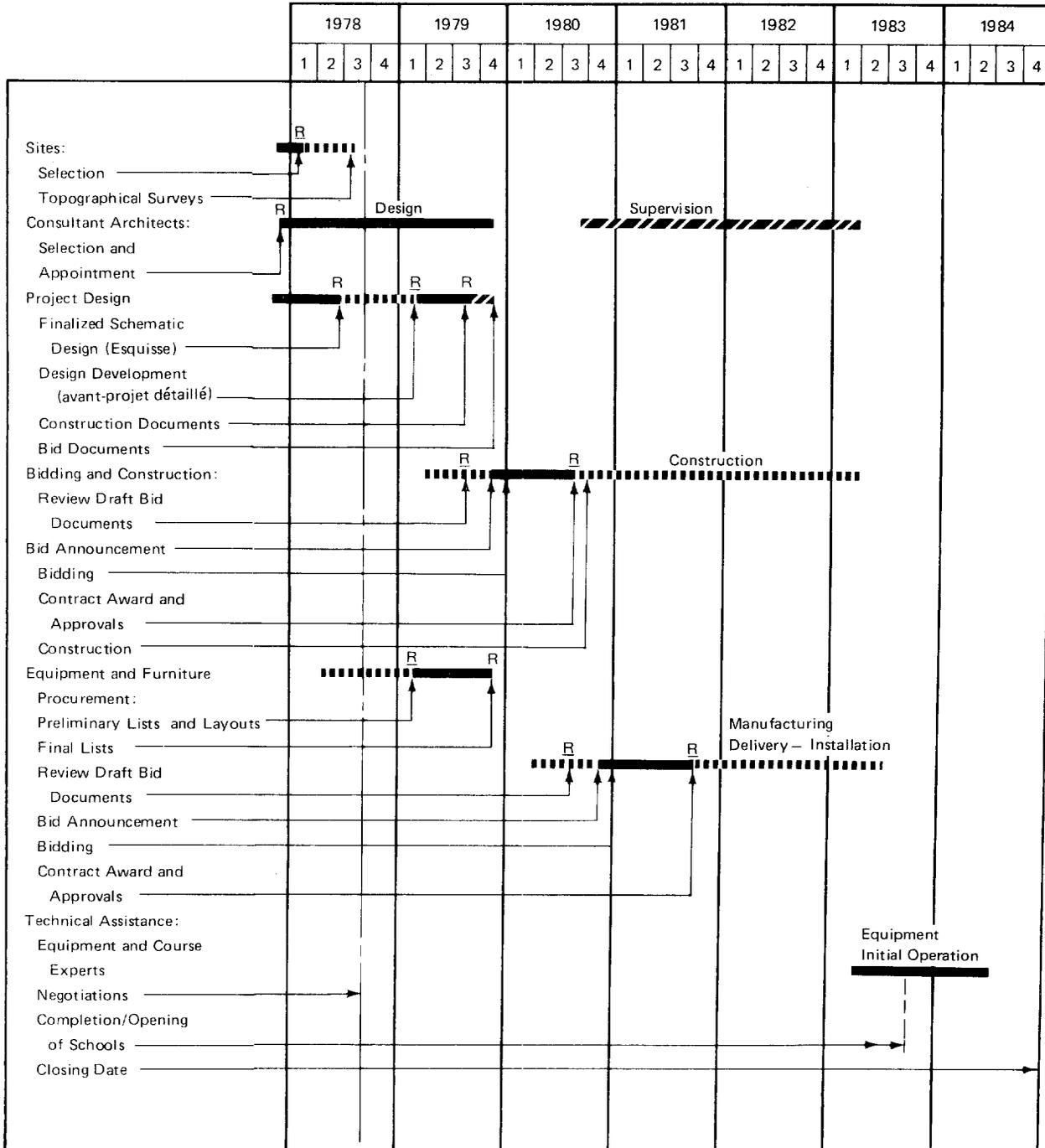
5.02 The project is suitable as the basis for a loan of US\$113 million to the Kingdom of Morocco for a term of twenty years with a grace period of five years.

MOROCCO IV
STRUCTURE OF THE EDUCATION AND TRAINING SYSTEM

ANNEX 1
Chart 1

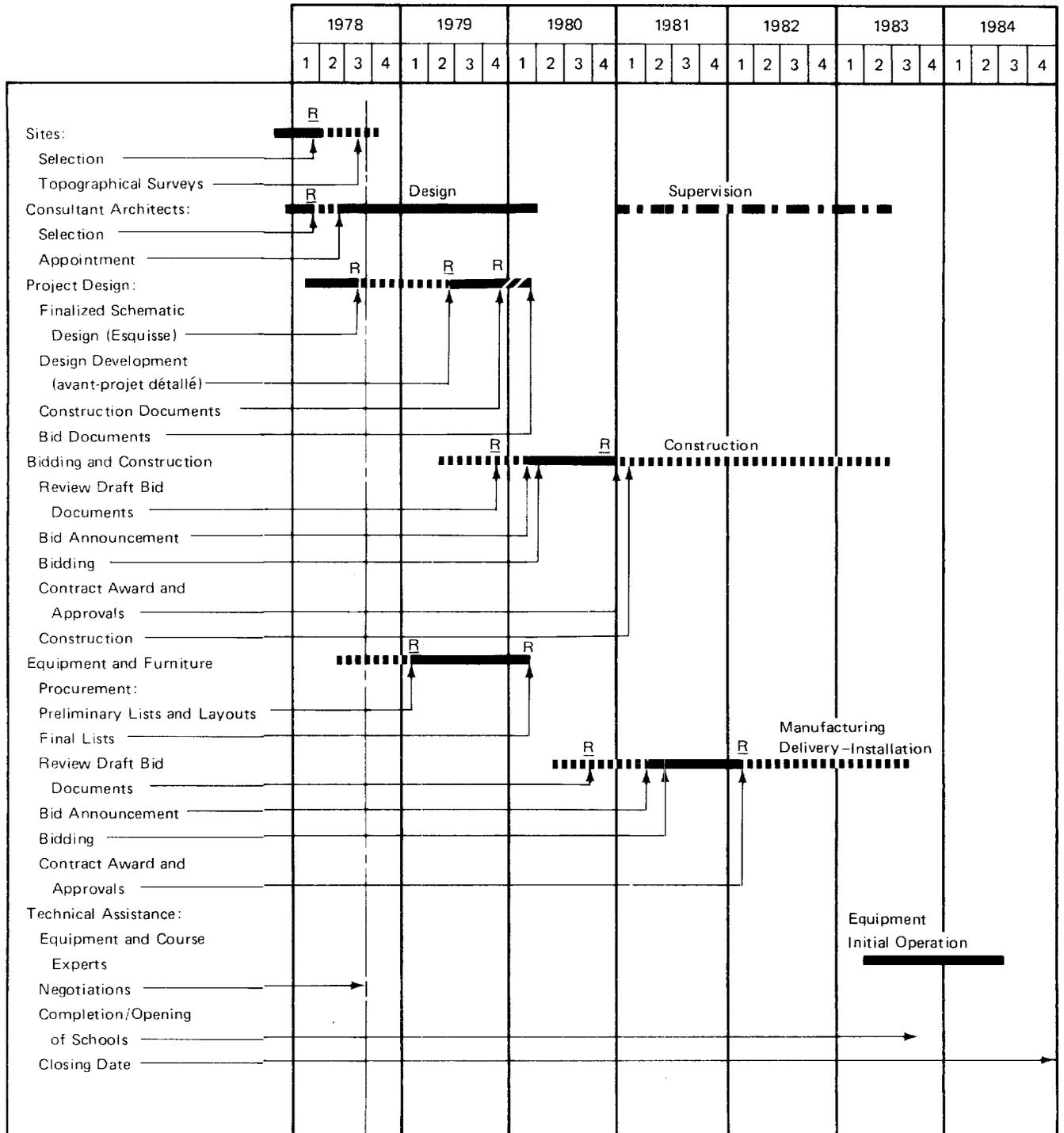


MOROCCO IV
Implementation Schedule
5 Secondary Technical Schools
Technical Teacher Training College
National Institute of Applied Engineering
(engineering designs financed under Loan 1220-T MOR)



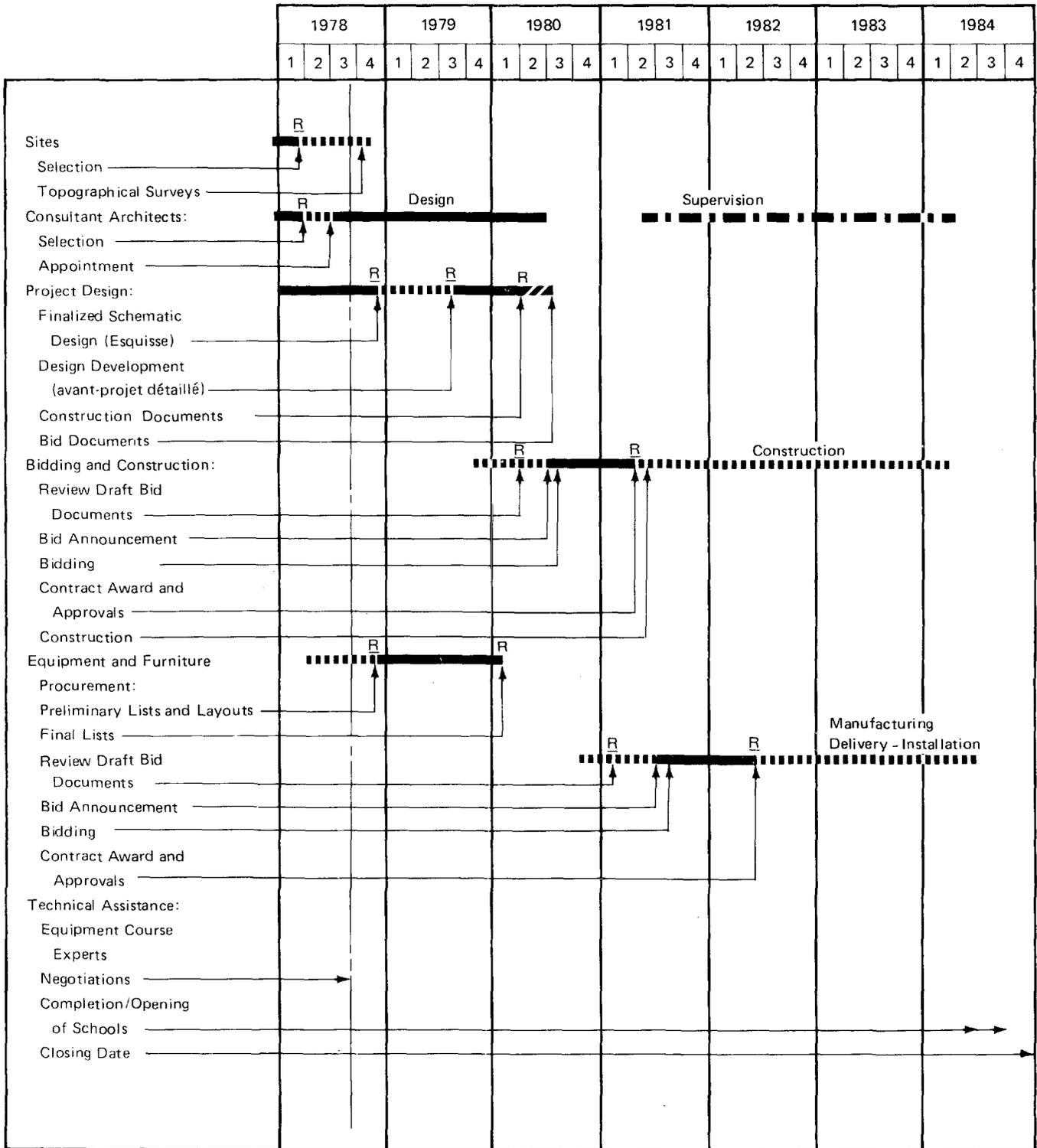
R -- Bank Review
R -- Bank Review & Approval

MOROCCO IV
Implementation Schedule
6 Secondary Technical Schools
2 Higher Institutes of Technology



R – Bank Review
R – Bank Review & Approval

MOROCCO IV
Implementation Schedule
Extension of Mohammedia Engineering College



R -- Bank Review
R -- Bank Review & Approval

COMPARATIVE EDUCATION INDICATORS

APRIL 1, 1979

	POP. YR. MILLS.	GNP/ CAPITA AT MARKET PRICES (US\$)	% GNP DEVOTED TO EDU. (PUBLIC EXP. ONLY)	% TOTAL PUBLIC DEVOTED TO EDU.	% OF PUBLIC EDUCATION EXP. ALLOCATED TO: PRI. SEC. HI.	LITER- ACY RATE (% OF ADULTS)	PRI. ENROLL- MENT RATIO (%)	COMPLE- TION RATE FOR PRI. SCH. CYCLE (%)	PRI. STU- DENTS PER TEACHER	AV. PRI. SALARY TO GNP/ CAPITA	PROGRESS- ION RATE FROM PRI. TO SEC. (%)	SEC. ENROLL- MENT RATIO (%)	SEC. STU- DENTS PER TEACHER	HIGHER ENROLL- MENT RATIO (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
ADVANCED															
AUSTRIA	74	7.5F	4.870F	5.3Y	8.5EY	24Y 51Y 15Y	99	98	93D	26D	2.0D	99D	51D	19D	16.85Y
CANADA	75	22.8	7.135	7.3	16.7	30 37 26	98	99	97	19	2.0	99	90	18	16.00
GERMANY F. REP.	75	61.8	6.670	5.0	10.2	31EY 64** 26EY	99	90	99	23EY	...	99Y	84Y	22C	20.26Y
JAPAN	75	111.6	4.450	4.3E	20.7E	40UY 37UY 11UY	99	99D	99C	25	2.0B	99C	95Y	20C	24.69Y
NETHERLANDS	75	13.7	5.425	9.4	22.4D	21 39 25	99	95	95	29	2.0	97	80	20	12.00
NEW ZEALAND	73	3.1F	4.280F	5.2	...	39 24 29	99	99	99	26	...	99	67	19	24.00
NORWAY	76	4.0	8.043	7.2	14.4	54 24 15	99	99	99	16	1.5	99E	62	11	11.00
SWEDEN	76	8.2	8.150	8.8	14.0	23 29 12	99	99	99	16	...	90?	85C	13	30.00C
U.K.	75	56.0	3.780	7.1	13.9	26 41 18	99	99	...	24	2.0	...	68	17	21.00X
U.S.A.	76	214.6	7.950	5.4	15.8	...	72** 28	99E	99	99	22	...	93	19	24.00
EUROPE															
GREECE	76	9.1	2.590	2.6	10.4	37 26 21	86B	99	82D	31	2.0	70E	80	27	15.00
IRELAND	74	3.1F	2.390F	5.1	13.9D	43Y 41Y 14Y	98	108XY	99A	35	...	95A	65XY	19	15.47Y
PORTUGAL	75	9.8	1.570	4.4	17.8	52 27 13	70	98	55	21	3.0	70	29	14	7.60
ROMANIA	75	21.2	1.240	4.0	6.4	36 19 13	98	101X	...	21	...	98	49	22	10.00
SPAIN	74	35.3F	2.750F	2.4B	15.2A	49Y 22Y 15Y	94A	115XY	...	35A	...	...	78XY	30	17.68Y
AFRICA															
ALGERIA	77	16.9	990G	7.5	14.3FY	42 ... 21	35	78X	45	39	4.0	55	26X	13	6.00
BENIN	74	3.1F	130F	7.2N	36.0Y	47D 23D 10D	11D	44XY	70B	53Y	25.0B	43B	11XY	39B	0.74Y
BOTSWANA	76	0.7	410	4.0	19.2	53 20 14	3	72X	95	32	3.0	60	12	22	0.30
BURUNDI	74	3.7F	110F	2.5	19.9Q	47R 41R 12R	10	20X	30?	38	10.0	14	2X	18	1.0
CAMEROON	76	7.7	314	3.7	21.5	33 43 20	...	60	45	52	4.0	2.0	9D	24	0.90CY
C.A.R.	74	1.8F	220F	3.0D	17.0D	56B 19B ...	...	79XY	25	69Y	...	18	8XY	27BY	0.21Y
CHAD	75	4.0	120	3.0	10.0	78 22 ...	15	29XBY	30	65BY	15.0	8	2XBY	30	0.018Y
CONGO(B)	74	1.3F	510F	6.0	19.3	40 32 21	50?	133X	63	63	6.0	48	33X	22	3.40
EGYPT	76	38.2	310	5.9N	...	30 32 25	44	76	80	31	...	79	45	20	12.00
ETHIOPIA	77	29.0	100	2.4	12.5	44 31 14	10	26	...	50	...	63	8	38	...
GABON	74	0.5F	2.540F	5.0D	20.6D	25D 9D 11D	...	100Y	25C	46C	5.0	18A	31Y	21C	0.29Y
GAMBIA	76	0.5	170	3.3	11.5	46 25 6	10	27	90	33	...	92	13	25	...
GHANA	74	9.9F	590F	...	19.7Y	43Y 22Y 20Y	...	60XY	62B	30Y	...	14B	35XY	16CY	1.09Y
GUINEA	76	4.7	180F	4.3NQ	...	30 31 30	...	30X	64	45	12F	86	13X	26	4.00
IVORY COAST	76	7.0	610	6.8	23.1	33 46 13	9A	50	86	43	7.0	47	17XY	26	1.64Y
KENYA	76	13.8	240	5.9	26.0	67 23 10	40	80?	50?	34	6.0	30	16	27	1.0
LESOTHO	75	1.2	160	12.0P	23.0	49 18 20	40	85	50	52	7.0N	81	10	26	1.00
LIBERIA	75	1.5	410	2.4	13.2	27 15 20	73	58	...	35	2.0	...	12	26	1.10AY
MADAGASCAR	77	8.0	240	4.0	24.0	53 28 19	50	90	33	44	6.0	38	14	23	1.70
MALAWI	77	5.6	140	2.2	9.3	40 17 22	25	56X	21	61	5.0	9	5X	21	0.47
MALI	75	5.7F	90F	4.2M	33.0F	45F 37F 18F	10F	22XF	...	48F	9.5F	50F	6X	21	...
MAURITANIA	71	1.3F	320F	4.1Y	20.0Y	...	...	10A	17XY	...	...	...	3XY	24A	...
MAURITIUS	76	0.9L	680	4.7	12.1	50 26 6	80C	94	99	24	4.5	90	45	32	1.50
MOROCCO	76	18.2	520	6.3	15.2	39R 48R 13R	28	65X	33	40	...	33	17X	22	4.00
NIGERIA	74	75.0F	340F	4.1DY	24.2DY	23Y 16Y 42Y	...	49XY	...	34DY	...	...	10XY	20CY	0.48Y
RWANDA	73	4.1F	100F	3.2C	28.0D	...	...	52	...	51	...	...	2	13	0.23CY
SENEGAL	77	5.2	420	5.0	23.0	46 34 20	10	32	...	49	10.0	20	10	21	1.5
SIERRA LEONE	73	3.0F	200F	3.4	23.4	31 36 30	15?	34X	45	32	4.0E	68	13X	21	0.53BY
SOMALIA	75	3.2	110	3.7Q	10.8Q	49Q 16Q 19Q	50?	34X	86	35	10.0	60	3	15	0.10
SUDAN	76	15.9	290	4.5	19.9	48 36 16	20	34	74	33	3.8	33	14	24	1.24
SWAZILAND	75	0.5	470	3.8	...	38 31 19	50	73	71	38	3.8	51	24	22	1.00
TANZANIA	76	15.1	180	6.6	17.4	42 21 12	80	93X	81	49	6.6	6	4X	19	0.34
TUNISIA	73	5.6F	730F	6.3	23.4	37 43 18	55	72	81	41	6.0	31	14	21	3.00
UGANDA	75	11.6	230	3.4DY	15.7DY	34EY 40EY 22EY	25A	53XY	...	34EY	...	14A	6XY	21A	0.56Y
UPPER VOLTA	77	5.8	118	3.4	23.9	31 16 32	5C	13	23	51	24.0	19	2	25	1.0
ZAIRE	76	25.6	140	6.0	22.0	49 26 25	15	86X	44	42X	2.0	41	13X	27	1.00X
ZAMBIA	76	5.1	440	6.8	15.9	54 22 22	39	97X	80	49	7.0	21	16	23	1.50
CENTRAL AMERICA AND THE CARIBBEAN															
BARBADOS	76	0.2	1,620	8.1	22.1	43 31 16	99	106X	99	21	3.0	99	94X	17	...
COSTA RICA	75	2.0	960	5.2B	22.7B	57B 25B 12B	89B	109XY	65B	29B	3.0B	58B	52XY	25B	17.15Y
CUBA	78	9.5	9,500	8.0	11.0	...	...	96	98	22	2.7	98	65	15	15.00
DOMINICAN REP.	72	4.7F	720F	3.0	13.9	42 24 22	51	80	17	54	3.0D	63	13.5	24	7.00
EL SALVADOR	77	4.1	570	4.4	27.2	64 8 27	62	88X	32	39	2.2	41	23	21	7.00
GUATEMALA	73	6.3F	570F	1.9	16.0	55 23 14	47	64	26	35	3.0	69	8	25	4.09Y
HAITI	76	4.7	200	1.0	8.0	61 21 11	20B	25F	13	56U	3.0	62	4	...	0.7
HONDURAS	75	2.9	390G	4.2G	18.8G	62G 15G 19G	53	78	30	35	3.0	88	11	17	4.00
JAMAICA	76	2.1	1,070	9.9	16.2	37 33 22	86E	91	52	39	4.5	94	64	25	7.58
MEXICO	75	59.9	1,050	3.1DQ	12.0DQ	51Y 26Y 12Y	76	112XY	31	46	3.0	63	35XY	23A	8.97EY
NICARAGUA	74	2.3F	700F	2.5	14.2	61 13 13	57	65	21	37	2.0	93	17	24	7.00
TRINIDAD & T.	77	1.1	2,185	4.5	14.1	48 32 20	95	98	91	30	3.0	49	62	24	...
SOUTH AMERICA															
BOLIVIA	76	5.8	315F	5.0	17.5F	...	...	38	17B	29D	24	5F	48	18D	...
BRAZIL	75	107.0	1,030	5.0	12.4	42E 20E 37E	64A	86G	...	27CY	...	...	26G	15CY	6.00B
CHILE	75	10.3	990	3.8RY	12.5RY	23Y 10Y 50Y	...	119XY	...	35Y	...	...	48XY	...	16.55Y
COLOMBIA	74	23.6F	580F	3.3DY	21.2DY	44DY 22DY 11Y	73	105XY	20	33Y	4.0	90	36XY	14A	6.67Y
ECUADOR	75	7.1	590	3.7D	27.7C	...	...	69	102XY	...	...	...	38XY	14C	...
GUYANA	74	0.8F	510F	5.8N	14.7Q	47 35 14	83A	92X	39	33	6.0	19	62X	24	1.00
PARAGUAY	74	2.6F	580F	1.8	11.0	55 13 22	81	82	26	30	1.9	65	17	12	5.00
PERU	75	15.4	760	4.2DY	21.7DY	40Y 22Y 15Y	72	111XY	38	39DY	3.0	70	48XY	23DY	14.41Y
URUGUAY	75	2.8	1,300	2.5	15.3	46 34 20	94	93X	...	24	...	83	...	10	...
VENEZUELA	73	12.0F	2,280F	4.6	19.9	30Q 28Q 35Q	77A	81	...	33	2.4	...	33	...	12.63CY

YR	POP. MILLS.	MARKET PRICES (US\$)	GNP/CAPITA AT MARKET PRICES ONLY	% GNP DEVOTED TO EDUC. (PUBLIC)	% TOTAL PUBLIC EXP. DEVOTED TO EDUC. PRI.	% OF PUBLIC EDUCATION RECURRENT	LITERACY RATE (% OF ADULTS)	PRI. ENROLL. RATIO (%)	COMPLETION RATE FOR PRI. SCH. (%)	STU-DENTS PER TEACHER	AV. PRI. SALARY IN RELATION TO GNP/CAPITA	PROGRESS FROM PRI. TO SEC. (%)	SEC. ENROLL. RATIO (%)	SEC. STU-DENTS PER TEACHER	HIGHER ENROLL. RATIO (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		

ASIA AND OCEANIA

AFGHANISTAN	77M	14.3	160G	1.8	11.6	47	19	15	12	29X	69	37	3.0G	62	8X	17	1.00
BANGLADESH	73	78.6F	90F	1.2	20.2	44Y	22Y	21Y	23D	56X	...	48D	...	23XD	28	...	
CHINA (TAIWAN)	73	16.0F	930F	3.2	14.0	28	41	22	82	98C	94	40	14.0	84	61C	26	20.00C
INDIA	75	608.1	140	2.6VY	...	...	...	...	29B	65XY	...	43A	...	29XY	20AY	2	2.34EY
INDONESIA	76	130.2	240	3.0	11.0	26	32	15	60B	79EX	43E	30E	2.0	52E	19EX	14E	2.00
IRAN	73	33.4F	1,660F	3.3	12.6	50B	18B	12B	50	77	74A	32	5.0B	80A	24	32	4.32CY
IRAQ	75	11.1	1,250	6.7C	16.3DR	...	...	...	26C	93XY	...	22	...	35XY	26C	8	4.47Y
JORDAN	73	2.7F	460F	7.0	8.8	52	15	21	59	91X	76	38	5.0	84	50X	22	4.00
KOREA	76	35.9	698	3.0	15.60	65	13	8	92F	103X	97	50	2.6	80	84	39	14.4
LEBANON	72	3.2F	1,070F	3.5	18.0	39	40	10	68	86	65	19	2.0	63	26U	25	23.00
MALAYSIA	76	12.6	860	6.7	26.0	42	34	15	60C	95	93	32	3.7	78	48	28	3.00
NEPAL	76	12.6F	110F	1.1	10.0	29	20	41	19	59	28	31	2.3	64	14	24	0.8
OMAN	72	0.8F	2,300F	1.7N	3.8	96	-	-	20	24X	99	27F	7.0	...	0.4X	9	...
PAKISTAN	75	69.2	160	1.6	16.2	45	25	18	21	47X	50	39	2.0	...	17X	18	6.00
PAPUA N.G.	75	2.8	470	5.6	16.1	38	16	24	32	577	73P	31	11.0	90	12X?	24	0.907
PHILIPPINES	74	42.2F	380F	2.5	14.9	73	15	12	87	104X	...	34	15.0	...	46X	...	21.00
SINGAPORE	74	2.3F	2,450F	2.7Y	9.2Y	39Y	39Y	17Y	75A	109XY	72A	31Y	...	99A	44XY	24	7.68Y
SYRIA	75	7.4	720	3.6	6.9	39	25	26	53	89	70	35	2.0	92	45	21	12.00
THAILAND	73	41.9F	350F	4.0NF	20.7F	65	9	15	32	87X	93C	32	3.0 U	91C	21X	24	2.00
TURKEY	73	40.2F	900F	5.6CY	20.6CY	...	...	...	...	85Y	...	34Y	...	...	24Y	27DY	5.83Y
YEMEN	73	5.9F	200F	0.5	4.0	45P	21P	23P	10	15X	18	36	5.0	75	2X	19	0.058Y
YEMEN P.D.R.	76	1.7	280	6.6	...	57	28	8	20	89X	48	30	5.0	94	21X	24	0.10

SUMMARY FOR DEVELOPING COUNTRIES:

NUMBER OF COUNTRIES:	94	90	88	88	85	87	95	74	95	68	77	94	91	84
RANGE:	(0.5-12.0)	(3.8-33.0)	(25-96)	(5-47)	(2-41)	(3-98)	(14-133X)	(13-99)	(19-69)	(1.9-25.0)	(7-99)	(4-80)	(9-39)	(.01-23.0)
QUANTILES: UPPER :	5.1	21.2	54	32	22	73	94	76	46	7	83	36	25	7.0
MEDIAN:	3.9	16.3	45	23	18	50	78	55	36	4	63	17	23	2.3
LOWER :	3.0	12.4	38	18	12	20	53	30	32	3	43	9	20	.9

SYMBOLS: ...	DATUM UNAVAILABLE	A=1970 OR BEFORE	M=CURRENT PRICES	SOURCES:
-	MAGNITUDE NIL OR NEGLIGIBLE	B=1971	N=GDP	-----
?	QUESTIONABLE	C=1972	P=INCLUDING FOREIGN AID	COLUMNS: 1 AND 2 WORLD BANK ATLAS
*	INCLUDES PART-TIME STUDENTS	D=1973	Q=CENTRAL GOVT. ONLY	OR IBRD MISSIONS
**	COMBINED WITH PRIMARY	E=1974	R=MINISTRY OF EDUCATION (MOE) ONLY	3 TO 14 IBRD MISSIONS
***	UNDER REVIEW	F=1975	S=MOE AND STATE GOVT. ONLY	AND/OR UNESCO
		G=1976	T=EXCLUDING CENTRAL GOVT.	STATISTICAL
			U=PUBLIC ONLY	YEARBOOK
			V=INCLUDING PRIVATE EXPENDITURE	
			X=INCLUDING OVERAGED STUDENTS	
			Y=UNESCO SOURCES	

COMPARATIVE EDUCATION DATA ARE USEFUL IN THE EVALUATION OF VARIOUS EDUCATION SYSTEMS AND ANALYSIS OF RELATIVE STAGES OF EDUCATIONAL DEVELOPMENT BETWEEN VARIOUS COUNTRIES. HOWEVER, ON THE BASIS OF THE PRESENT DATA, CROSS-NATIONAL COMPARISON SHOULD BE APPROACHED WITH GREAT CAUTION. DATA PRESENTED IN THE ABOVE TABLE HAVE BEEN COLLECTED LARGELY BY THE BANK MISSIONS FROM GOVERNMENT SOURCES; THE REMAINDER ARE STAFF ESTIMATES OR DATA FROM UNESCO. EFFORTS HAVE BEEN MADE TO STANDARDIZE DEFINITIONS AND WITHIN LIMITS, TO CHECK THE ACCURACY OF THE DATA. NEVERTHELESS, SUCH DATA ARE STILL IMPERFECT IN SEVERAL RESPECTS AND THE BANK IS WORKING TO IMPROVE THEM PROGRESSIVELY ON THE OCCASION OF ITS OPERATIONAL WORK. IN THE USE OF THESE DATA, THE FOLLOWING QUALIFICATIONS SHOULD BE BORNE IN MIND:

- "EDUCATION" AS DEFINED IN THE TABLE INCLUDES ALL EDUCATION AND TRAINING, FORMAL AND NON-FORMAL;
- "PRIMARY EDUCATION" REFERS TO EDUCATION AT THE FIRST LEVEL AND "SECONDARY" EDUCATION REFERS TO ALL EDUCATION AT THE SECONDARY LEVEL REGARDLESS OF TYPE (E.G. GENERAL, TECHNICAL, AGRICULTURAL);
- "LITERACY RATES" (COL. 6) ARE OFTEN OBTAINED FROM COUNTRY CENSUSES. IN MANY COUNTRIES THEY ARE ONLY APPROXIMATIONS AND IT IS DOUBTFUL THAT ANY UNIFORM DEFINITION OF "LITERATE" HAS BEEN FOLLOWED CONSISTENTLY;
- "PUBLIC EXPENDITURE IN EDUCATION" (COLS. 3, 4 AND 5) REFER TO ALL CAPITAL AND RECURRENT EXPENDITURES DEVOTED TO EDUCATION BY PUBLIC AND QUASI-PUBLIC AGENCIES;
- "ENROLLMENT RATIOS" (COLS. 7, 12 AND 14) REFER TO SCHOOL YEAR AND MEAN THE PERCENTAGE OF ELIGIBLE CHILDREN ENROLLED FULL-TIME IN THE APPROPRIATE SCHOOL, PUBLIC AND PRIVATE BY LEVEL. THEY ARE OFTEN SUBJECT TO A WIDE MARGIN OF ERROR IN THE DEVELOPING COUNTRIES OWING TO VARIATION IN THE ACCURACY OF BASIC DATA (I.E. AGE-SPECIFIC POPULATION AND ENROLLMENTS). ENROLLMENT FIGURES FREQUENTLY ARE HIGHER THAN THE NUMBER OF STUDENTS ACTUALLY IN SCHOOL. OVERAGED STUDENTS WHOSE INCLUSION IS INDICATED BY FOOTNOTES ALSO CAN INFLATE THE RATIOS.

MOROCCO IVTechnical Assistance Requirements

<u>Institution</u>	<u>Experts</u>		<u>Fellowships ^{1/}</u>	
	<u>No.</u>	<u>Manyears</u>	<u>No.</u>	<u>Manyears</u>
Technical Lycées	3	4	4	1 1/3
Technical Teacher Training College	4	5 1/3		
National Institute of Applied Engineering	4	5 1/3		
Higher Institutes of Technology	4	5 1/3		
Project Implementa- tion Unit	2	8		
Total	17	28	4	1 1/3

^{1/} Fellowships for overseas training of Moroccan teaching staff for the project institutions would be provided under bilateral aid agreements with France and Belgium.

MOROCCO IV

Unit Capital Cost ^{a/}and Areas per student

Type of facility	Gross Area per student ^{b/} m2	Buildings & Site works ^{c/}	Furniture	Equipment	Total
			-----US\$-----		
<u>Technical Lycées:</u>					
Academic and communal	10.0	3,980	340	1,970	6,290
Boarding	6.2	2,420	210	--	2,630
Administrative staff housing	100.0	38,060	--	--	38,060
<u>Regional Technical Teacher Training College:</u>					
Academic and communal	10.5	4,400	380	1,960	6,740
Boarding	9.6	3,870	340	--	4,210
Administrative staff housing	115.0	47,110	--	--	47,110
<u>Higher Institutes of Technology:</u>					
Academic and communal	13.8	6,330	540	3,400	10,270
Boarding	9.6	3,890	340	--	4,230
Administrative staff housing	115.0	46,480	--	--	46,480
<u>National Institute of Applied Engineering:</u>					
Academic and communal	14.4	6,560	570	5,500	12,630
Boarding	9.3	3,760	330	--	4,090
Administrative staff housing	115.0	46,480	--	--	46,480

a/ excluding professional fees and contingencies

b/ excluding covered galleries (about 6% of gross areas) the cost of which is included in the cost estimate

c/ estimated average regional costs

Contingency Allowances

	Site Development		Building		Furniture		Equipment		Professional Services		Technical Assist. Experts		Total project costs		
	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	TOTAL
Contingencies (as % of Project Cost):															
Unforeseen	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0	5.0			
Price Escalation a/	32.0	24.0	32.0	24.0	37.0	25.0	34.0	35.0	13.0	13.0	20.0	20.0			
Total	45.2	36.4	45.2	36.4	50.7	37.5	47.4	48.5	24.3	24.3	26.0	26.0			
Project Cost (without contingencies):															
DH Millions	31.3	200.0	208.8	133.5	9.9	23.2	15.5	139.4	29.6	6.1	1.4	5.5	296.5	327.7	624.2
US\$ Millions	7.6	4.9	51.0	32.5	2.4	5.7	3.8	34.0	7.2	1.5	0.3	1.4	72.3	80.0	152.3
% foreign exchange		39.0		39.0		70.0		90.0		17.0		80.0			52.5
Contingencies (amounts):															
Unforeseen															
DH Million	3.1	2.0	20.9	13.3	1.0	2.3	1.5	14.0	3.0	0.6	0.1	0.3	29.6	32.5	62.1
US\$ Million	0.8	0.5	5.1	3.2	0.2	0.6	0.4	0.4	0.7	0.2	0.0	0.0	7.2	7.9	15.1
Price Escalation															
DH Million	11.0	5.3	73.5	35.2	4.1	6.4	5.8	53.6	4.2	0.9	0.3	1.2	98.9	102.6	201.5
US\$ Million	2.7	1.3	17.9	8.6	1.0	1.5	1.4	13.1	1.1	0.2	0.0	0.4	24.1	25.1	49.2
Subtotal															
DH Million	14.1	7.3	94.4	48.5	5.1	8.7	7.3	67.6	7.2	1.5	0.4	1.5	128.5	135.1	263.6
US\$ Million	3.5	1.8	23.0	11.8	1.2	2.1	1.8	16.5	1.8	0.4	0.0	0.4	31.3	33.0	64.3
% foreign exchange		34.0		34.0		63.3		90.2		17.0		80.0			51.3
Total Project Cost (with contingencies):															
DH Million	45.4	27.3	303.2	182.0	15.0	31.9	22.8	207.0	36.8	7.6	1.8	7.0	425.0	462.8	887.8
US\$ Million	11.1	6.7	74.0	44.3	3.6	7.8	5.6	50.5	9.0	1.9	0.3	1.8	103.6	113.0	216.6
% foreign exchange		37.5		37.5		68.0		90.1		17.0		80.0			52.2
Total contingencies: as % of total project cost 29.7; as % of project cost without contingencies 42.2															

Exchange rate: US\$ 1 = 4.100 DH

a/ Price escalation computed on basis of :

- 1) separate annual increase rates for local and foreign exchange costs;
- 2) project completion 6/1984 or 5.5 years from Loan signing (includes one year for completion of Tech. Asst. program)
- 3) estimated progress of work per year and corresponding price increase rates;
- 4) project cost including the physical unforeseen contingency.

	1978		1979		1980		1981		1982		1983		1984	
	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
Civil works	11.0	8.0	10.0	7.5	9.0	7.0	8.0	7.0	7.0	7.0	7.0	7.0	-	-
Furniture	11.0	7.0	10.0	6.5	9.0	6.0	8.0	6.0	7.0	6.0	7.0	6.0	-	-
Consultant architects	11.0	8.0	10.0	7.5	9.0	7.0	8.0	7.0	7.0	7.0	7.0	7.0	-	-
Technical assistance	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0
Equipment	11.0	10.0	10.0	10.0	9.0	8.0	8.0	8.0	7.0	8.0	7.0	8.0	-	-

MOROCCO IV

Estimated Schedule of Disbursements
(in US\$ million)

Fiscal Year	Calendar Year	Semester ^{1/}	Disbursements		Accumulated Disbursements		Undisbursed Balance	
			Amount	%	Amount	%	Amount	%
	78	1						
79		2						
1/1/79	79	3	0.0	0.0	0.0	0.0	113.0	100.0
80		4	0.2	0.2	0.2	0.2	112.8	99.8
	80	5	0.4	0.4	0.6	0.6	112.4	99.4
81		6	4.3	3.8	4.9	4.4	108.1	95.6
	81	7	6.6	5.8	11.5	10.2	101.5	89.8
82		8	17.7	15.7	29.2	25.9	83.8	74.2
	82	9	30.1	26.6	59.3	52.5	53.7	47.5
83		10	25.1	22.2	84.4	74.7	28.6	25.3
	83	11	17.1	15.1	101.5	89.8	11.5	10.2
84		12	8.5	7.5	110.0	97.3	3.0	2.7
	84	13	3.0	2.7	113.0	100.0	0.0	0.0
85		14						
	85	15						

^{1/} Beginning from anticipated date of Loan Agreement, April 1979

RELATED DOCUMENTS AND DATA
AVAILABLE IN THE PROJECT FILE

A. General Reports and Studies Relating to Education

1. Le Maroc Universitaire, 1976-77, Ministere de l'Enseignement Superieure, 1977
2. Statistiques de l'Enseignement Secondaire, 1976-77, Ministere de l'Enseignement Primaire et Secondaire, 1977
3. Statistiques de l'Enseignement Primaire, 1976-77, Ministere de l'Enseignement Primaire et Secondaire, 1977
4. Statistiques des Etudiants inscrits dans les Etablissements de Formation des Cadres Superieurs au Maroc, 1976-77, Ministere de la Cooperation et de la Formation des Cadres, June, 1977
5. Carrieres -- Guide a l'Usage des Eleves des Classes Terminales, Ministere de la Cooperation et de la Formation des Cadres
6. Country Economic Memorandum on Morocco, IBRD Report No. 1473-MOR, June 30, 1977
7. Demographic Brief for Morocco, IBRD, January 1978
8. Budget de l'Annee, 1978, Ministere de l'Education Nationale et de la Formation des Cadres

B. Reports and Studies Related to the Project

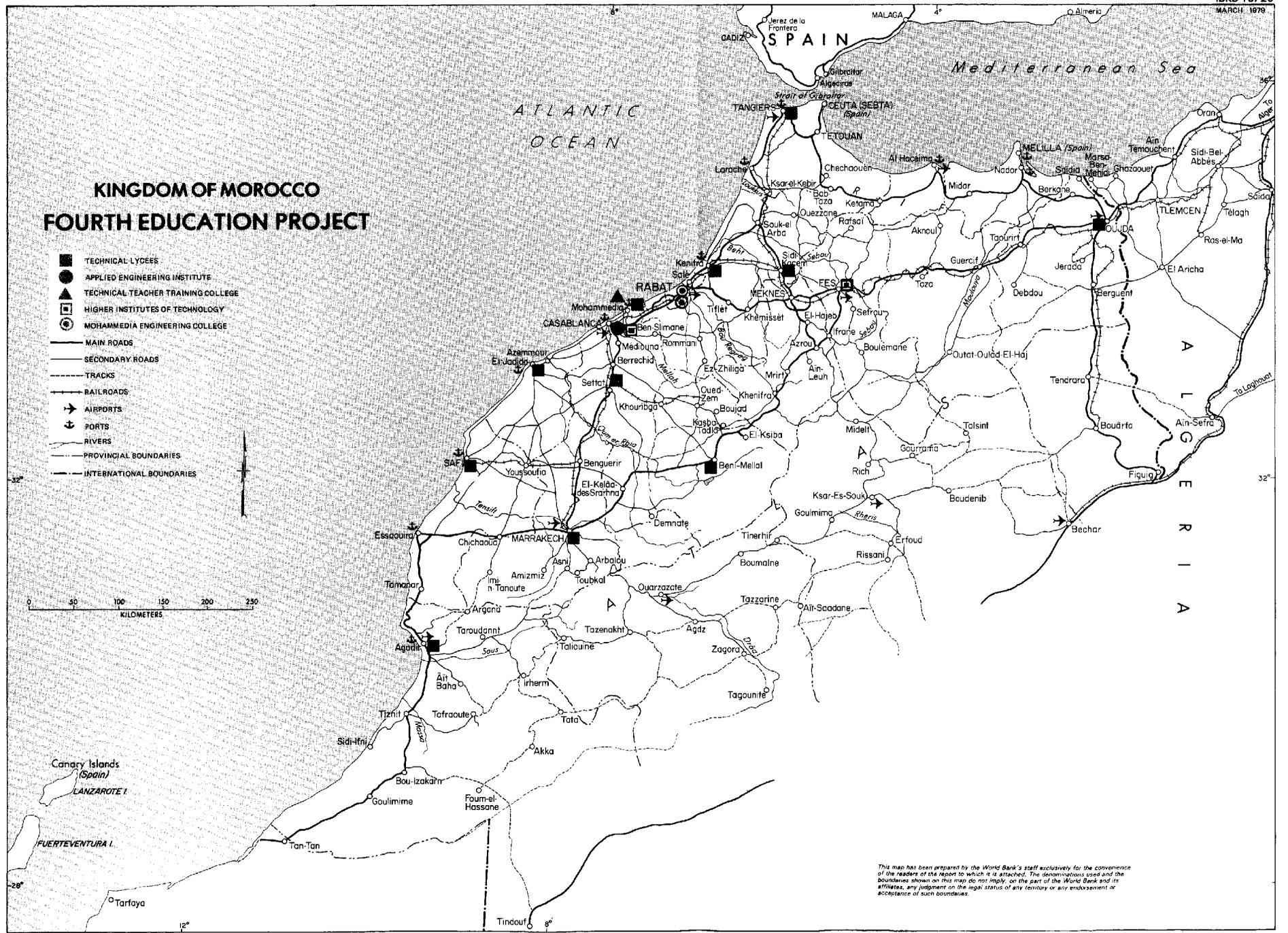
1. Project Request, Government of Morocco, February 1978
2. Elements de Project (five parts), Government of Morocco, February 1978

C. Selected Working Papers

Kingdom of Morocco: Fourth Education Project, Educational and Architectural Working Papers, August 1978

KINGDOM OF MOROCCO FOURTH EDUCATION PROJECT

- TECHNICAL LYCEES
- APPLIED ENGINEERING INSTITUTE
- ▲ TECHNICAL TEACHER TRAINING COLLEGE
- HIGHER INSTITUTES OF TECHNOLOGY
- ⊙ MOHAMMEDIA ENGINEERING COLLEGE
- MAIN ROADS
- - - SECONDARY ROADS
- TRACKS
- RAILROADS
- ✈ AIRPORTS
- ⚓ PORTS
- RIVERS
- - - PROVINCIAL BOUNDARIES
- - - INTERNATIONAL BOUNDARIES



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