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STUDY ON INDUSTRIALIZATION AND ECONOMIC CO-OPERATION
FOR THE NORTH AFRICAN SUB-REGION
(INDUSTRIAL MAP)

EVALUATION OF REQUIREMENTS IN,
AND TRAINING POSSIBILITIES FOR,
QUALIFIED STAFF UP TO 1980

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UNITED STATES
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INTRODUCTION

This memorandum sets out to evaluate:

- (a) The requirements of the Maghreb^{1/} and of Sudan^{2/} in qualified staff between 1965 and 1980;
- (b) the training possibilities for qualified staff in the countries concerned up to 1980;
- (c) the necessary investment involved (for schools, training centres, etc...) in order to produce this staff.

It is, however, necessary to make some preliminary remarks:

- (a) The countries in the Sub-region are rare, or indeed non-existent, which in their forecasts begin by studying their requirements in qualified staff in order to adapt their systems of education and training to producing the requisite numbers of such qualified staff, trained in the special skills desired. In this connection, the process of reasoning adopted is frequently the contrary of the logical one. There is a tendency to concentrate rather on achieving the generalized attendance at primary schools of children aged 6 or 7 years, to reintegrate the drop-outs by providing different forms of education where required (e.g. medium-level, specialized and agricultural education, etc...) and to provide vocational training and the further training of adults. Attempts are then made, after the event, to evaluate requirements in qualified staff and to compare them with the output of such staff in order to determine the short-falls or surpluses arising in each category. It is obvious that a reversal

^{1/} In this memorandum, the term "Maghreb" covers four countries: Algeria, Libya, Morocco and Tunisia.

^{2/} In the UAR, forecasts regarding trained staff were to be made by national experts.

of the reasoning process adopted in this realm and of the corresponding action taken, so as to adapt output (or supply) of trained staff in anticipation of the requirements (or demand) for such staff, would make it possible to avoid making investments that sometimes prove valueless and to avoid training qualified staff for which there is no demand.

In this memorandum, therefore, so as not to fall into the same error, we shall begin by projecting demand, or the requirements in qualified staff, and we shall then consider the possibilities that exist for producing the staff to meet these requirements.

(b) It seems to us that, in the sphere of training qualified staff more than in any other, statistics based on precise and universally accepted definitions, are lacking. The only information at our disposal consists in simple indicators (ratios, percentages, per capita units, etc...), which, moreover, show variations from one country to another ranging from onefold to threefold and even more. Thus, in the absence of sectoral forecasts of requirements in qualified staff, made by experts in their own sectors, we shall be led to adopt some of these indicators and to extend them to several countries.

I - REQUIREMENTS IN QUALIFIED STAFF BETWEEN 1965 AND 1980

In the absence of censuses or of exhaustive and detailed surveys, based on "profiles" of clearly-defined occupations, it is not possible to arrive at a very detailed breakdown of requirements in qualified staff. We shall adopt a classification containing three categories: higher-level staff (professors, engineers, medical practitioners, directors of enterprises, departmental heads and the like); medium-level staff (teachers, senior instructors, foremen and overseers, and the like); and basic staff (junior instructors, subordinate office employees, skilled workers and the like). This classification has the advantage of corresponding with the different educational levels: higher, secondary and primary. In principle, those holding a certificate of primary education (certificat de fin d'études primaires) correspond with basic staff; holders of the secondary school certificate (bacheliers) with medium-level staff; and graduates with higher-level staff.

If these provisional definitions are accepted, we must seek a method of estimating requirements in qualified staff and of projecting them.

In Tunisia, the Perspectives Décennales de Développement (1962-1971) estimate that requirements in higher-level, medium-level and basic staff will be 10,000 persons, 50,000 persons and 100,000 persons respectively in ten years^{1/} - in other words, 1,000, 5,000 and 10,000 persons respectively each year.

From these figures, we can determine two ratios which might be of assistance to us:

(a) If we relate the requirements in qualified staff to the

^{1/} Perspectives Décennales (1962-1971), pp. 311 et seq.

total population, we find that these amount to 1 unit of basic staff to every 500 inhabitants, 1 unit of medium-level staff to every 1,000 inhabitants and 1 unit of higher-level staff to every 5,000 inhabitants (1/500, 1/1,000 and 1/5,000);

- (b) If we consider the internal ratio between the total figures of annual requirements in higher-level, medium-level and basic staff (1,000, 5,000 and 10,000), we find that there will be 1 unit of higher-level staff to every 5 units of medium-level and to every 10 units of basic staff (1 - 5 - 10).

This ratio is akin to that observed in Algeria in 1966 in the context of a survey conducted on the employment situation on 30 April 1966,^{1/} which covered 1,250 establishments employing a work force of 101,375 full-time wage-earners (or 40 per cent of the wage-earners in the sector under review). The breakdown of these establishments was as follows:

(a) By region

- Algiers region:	511
- Oran region:	348
- Constantine region:	297
- Sahara region:	94
- Total Algeria:	1,250 establishments surveyed

(b) By legal status

- Managed by workers:	218 establishments	employing	14,334 persons
- Private:	599	"	40,570
- Public:	411	"	44,113
- Other:	22	"	1,758
- Total:	1,250	"	101,375

(For the list of economic sectors covered, see the Table at Annex I; and for the breakdown of qualified staff between men and women, and between Algerians and non-Algerians, see the Table at Annex II).

1/ Résultats de l'enquête semestrielle sur la situation de l'emploi au printemps 1966, Sous-Direction des Statistiques, Algiers.

According to this survey, which covered, as may be seen, a broad cross-section, there were 2,573 higher-level staff, 20,632 medium-level staff and 33,894 basic staff, so that in other words the ratio was approximately 1 unit of higher-level staff to 8 medium-level and 13 basic staff (1 - 8 - 13).

In Sudan, the requirements in higher-level and medium-level staff for the decade 1961/1962 - 1970/1971 are 7,300 and 39,300 persons respectively, or 1 unit of higher-level to 5 units of medium-level staff.^{1/} The requirements in basic staff are added to those in unskilled manpower, so that it is impossible to discover the numbers of the former.

In the case of Libya,^{2/} requirements in higher-level, medium-level and basic staff for the period 1964-1969 were 5,054, 14,357 and 13,809 persons respectively or, in other words, 1 unit of higher-level staff to every 3 units of medium-level and 3 units of basic staff (1 - 3 - 3).

In short, we shall adopt the following ratios in order to calculate requirements in qualified staff: 1 unit of basic staff to every 500 inhabitants, 1 unit of medium-level staff to every 1,000 inhabitants, and 1 unit of higher-level staff to every 5,000 inhabitants during the period 1965-1970, both in the Maghreb and in Sudan or, in other words, a ratio of: 1 - 5 - 10.

During the period 1971-1975, requirements are estimated as being 1 unit of basic staff to every 450 inhabitants, 1 unit of medium-level staff to every 850 inhabitants, and 1 unit of higher-level staff to every 4,000 persons, so that, in other words, the ratio will improve and become: 1 - 4.7 - 8.9.

1/ See Annex III

2/ Kingdom of Libya, Ministry of Labour and Social Affairs - A Survey of Requirements of Professional, Technical and Skilled Manpower in Libya, 1964-1969 by A.N.K. Nair, see Annex IV.

During the period 1976-1980, requirements are estimated as being 1 unit of basic staff to every 400 inhabitants, 1 unit of medium-level staff to every 750 inhabitants, and 1 unit of higher-level staff to every 3,500 inhabitants, so that, in other words, there will be a fresh improvement in the ratio which will become: 1 - 4.6 - 8.7.

These per capita requirements when applied to the anticipated population^{1/} of the Maghreb and of Sudan between 1965 and 1980, will enable us to calculate the overall requirements for the entire period, which would be: 1,391,000 basic staff, 729,000 medium-level staff and 145,000 higher-level staff for the Maghreb (see Table I), and 623,000 basic staff, 325,000 medium-level staff and 68,000 higher-level staff for Sudan (see Table II).

Let us now consider the possibilities for training qualified staff between 1965 and 1980.

^{1/} The growth rate of the population, and the total population between 1965 and 1980, are taken from document E/CN.14/NA/ECOP/2 - Demographic Projection for North African Countries.

TABLE I

Qualified staff requirements in the Maghreb

Period	Annual growth rate of population (%)	Population midway through period (millions)	Qualified staff requirements (units)								
			Basic staff			Medium-level staff			Higher-level staff		
			Units of qualified staff per capita of population	Annual requirements	Requirements for period	Units of qualified staff per capita of population	Annual requirements	Requirements for period	Units of qualified staff per capita of population	Annual requirements	Requirements for period
1965-1970	3.0%	33.3	1/500	66.600	399.500	1/1000	33.300	200.000	1/5000	6.600	33.000
1971-1975	2.7%	38.6	1/450	85.800	429.000	1/850	45.400	227.000	1/4000	9.600	48.000
1976-1980	2.5%	45.3	1/400	112.500	562.500	1/750	60.400	302.000	1/3500	12.900	64.000
1965-1980					1.391.000			729.000			145.000

TABLE II
Qualified staff requirements in Sudan

Period	Annual growth rate of population (%)	Population midway through period (millions)	Qualified staff requirements (units)								
			Basic staff			Medium-level staff			Higher-level staff		
			Units of qualified staff per capita of population	Annual requirements	Requirements for period	Units of qualified staff per capita of population	Annual requirements	Requirements for period	Units of qualified staff per capita of population	Annual requirements	Requirements for period
1965-70	3.1%	14.7	1/500	29.400	176.000	1/10	14.700	88.000	1/5000	2.900	17.500
1971-75	2.9%	17.4	1/450	38.700	193.500	1/850	20.400	102.000	1/4000	4.300	21.500
1976-80	2.5%	20.3	1/400	50.700	253.500	1/750	27.000	135.000	1/3500	5.800	29.000
1965-80					623.000			325.000			68.000

II - TRAINING POSSIBILITIES FOR QUALIFIED STAFF BETWEEN 1965 AND 1980, COMPARED WITH REQUIREMENTS

In order to evaluate the possibilities that exist for training qualified staff up to 1980, we shall take as a basis the enrolment for primary education in 1965, and add to that figure the successive intakes of children of school age between 1965 and 1980, for whom a constantly increasing rate of school attendance will be applicable. A differentiation will be made in the rates applicable to girls and boys respectively.

Thus, when we make our assumptions as to the number of pupils who will be able to pass on from primary to secondary education, and then to higher education, we shall obtain the figures for enrolment at the two last-named levels of education.

In the Maghreb, children aged between 6 and 11 years in 1965 may be estimated at a figure of 3,031,000 boys and 2,995,000 girls.^{1/}

TABLE III

MAGHREB - Children of school age in 1965: children aged between 6 and 11 years

(thousands)

Boys	Girls	Total
3,031	2,995	6,026

The additional numbers of children (boys and girls) who will reach the age of 6 and thus be of school age between 1966 and 1980 have been estimated for the years 1966, 1970, 1975 and 1980, and for the periods 1966-1970, 1971-1975 and 1976-1980.

^{1/} These estimates, as well as those relating to the additional numbers of children reaching the age of 6 years, are derived from document E/CN.14/NA/ECOP/2, by taking the two age-groups of 5 to 9 years and 10 to 14 years, and by subtracting one-fifth from the first figure and three-fifths from the second figure.

TABLE IV

MAGHREB - Additional numbers of children reaching school age (6 years old)

(thousands)

Per year	1966		1970		1975		1980	
	Boys	Girls	B.	G.	B.	G.	B.	G.
	466	461	532	525	617	603	662	650
Per period	1966-1970		1971-1975		1976-1980		1966-1980	
	Boys	Girls	B.	G.	B.	G.	B.	G.
	2,480	2,465	2,880	2,845	3,200	3,160	8,560	8,450

The enrolment of school-age children between 1965 and 1980 is obtained by adding the numbers of children aged from 6 to 11 years in 1965, and the additional numbers of children reaching the age of 6 between 1966 and 1980 - in other words, 11,591,000 boys and 11,445,000 girls, making a total of 23,036,000 children of school age.

TABLE V

MAGHREB - Children of school age between 1965 and 1980

(thousands)

1965			1966-1980			1965-1980		
Children aged 6 to 11			Additional numbers of children reaching the age of 6			Total		
Boys	Girls	Total	B.	G.	Total	B.	G.	Total
3031	2995	6026	8560	8450	17010	11591	11445	23036

In 1965, the rate of primary school attendance in the Maghreb amounted to 70 per cent in the case of boys and 40 per cent in that of girls. The assumption is that it will gradually be increased, over successive five-year periods, to 90 per cent in the case of boys and 60 per cent in that of girls in the period 1976-1980 (see Table VI). For a variety of reasons, the rate of school attendance for boys cannot exceed 90 per cent (as there will still exist mentally and physically handicapped children for whom no suitable educational facilities will be available, children separated by long distances from any centre of education, parents who prefer to make their children work rather than send them to school, and the like).

In order to determine the numbers enrolled for higher and secondary education, we shall rely upon a relatively simple method, which consists in obtaining the ratio of the numbers enrolled for secondary and higher education to the numbers enrolled for primary education.

The following Table shows that, in 1964, the numbers enrolled for secondary and higher education represented 12.1 and 0.7 per cent respectively of those enrolled for primary education - in other words, for every 1,000 pupils attending primary schools, there were 121 pupils attending secondary schools and 7 students receiving higher education.

TABLE VI

MAGHREB - Enrolment for primary education

(thousands)

	1965		1966-70		1971-75		1976-80		1965-80		
	Boys	Girls	B.	G.	B.	G.	B.	G.	B.	G.	Total
Numbers of children of school age	2931	2995	2480	2465	2880	2845	3200	3140	11591	11445	23,036
Rate of school attendance	70%	40%	75%	45%	80%	50%	90%	80%	79%	50%	54%
Actual school enrolment	2122	1198	1860	1109	2306	1423	2280	1944	9166	5674	14 340

TABLE VII

MAGHREB - Enrolment at the three educational levels in 1964

(thousands)

LEVEL OF EDUCATION	ALGERIA	LIBYA ^{1/}	MOROCCO	TUNISIA	MAGHREB	FRANCE ^{1/}
Primary	1231	159	1105	669	3164	5700
of whom girls	(40%)	(19%)	(29%)	(34%)	-	(49%)
Secondary	102	26	173	83	384	3000
of whom general	(70)	(22)	(153)	(71)	-	-
technical	(30)	(2)	(19)	(9)	-	-
teacher training	(2)	(2)	(1)	(3)	-	-
Higher	5.9	1.6	10.1	4.6	22.2	450
TOTAL:						
Primary	100%	100%	100%	100%	100%	100%
Secondary/primary	8.2%	16.4%	15.6%	12.4%	12.1%	53%
Higher/primary	0.5%	1.0%	0.9%	0.7%	0.7%	8%

^{1/} In 1963

Source: UNESCO Statistical Yearbook, 1965

We might set as a target for secondary education an increase in enrolment from 12.1 to 25 per cent of the numbers enrolled for primary education, by 1980, and as a target for higher education an increase in enrolment from 0.7 to 4 per cent of those enrolled for primary education by the same date.

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TABLE VIII

MAGHREB - Enrolment for secondary and higher education

(thousands)

	1965	1966-1970	1971-1975	1976-1980	1965-1980
Enrolment for primary education	3320	2969	3727	4824	14480
Ratio secondary/primary	13%	15%	20%	25%	19%
Enrolment for secondary education	432	445	745	1206	2828
Ratio higher/primary	0,75%	1%	2%	4%	2,2%
Enrolment for higher education	25	29	74	193	321

Thus, for 14,480,000 children receiving primary education between 1965 and 1980, there will be 2,828,000 receiving secondary education and 321,000 higher education. The numbers enrolled for secondary and higher education will, in 1976-1980, represent 25 and 4 per cent respectively of those enrolled for primary education, compared with 53 per cent and 8 per cent in France in 1963. It does not appear, therefore, that the targets set are too ambitious.

In Sudan, in 1965, children of school age - that is, children from 6 to 11 years old - could be estimated at 1,375,000 boys and 1,344,000 girls.

TABLE IX

SUDAN - Children of school age in 1965: children aged between 6 and 11 years

(thousands)

Boys	Girls	Total
1,375	1,344	2,719

The additional numbers of children (boys and girls) reaching the age of 6, per year and per period, are given in the Table below:

TABLE X

SUDAN - Additional numbers of children reaching school age (6 years old)

(thousands)

Per year	1966		1970		1975		1980	
	Boys	Girls	B.	G.	B.	G.	B.	G.
	212	207	228	223	282	275	302	296
Per period	1966-1970		1971-1975		1976-1980		1966-1980	
	Boys	Girls	B.	G.	B.	G.	B.	G.
	1100	1075	1275	1250	1460	1440	3835	3455

The enrolment of children of school age between 1965 and 1980 may be obtained by adding together the numbers of children aged from 6 to 11 years in 1965, and the numbers of children who will reach the age of 6 between 1966 and 1980.

TABLE XI

SUDAN - Children of school age between 1965 and 1980

(thousands)

1965			1966-1980			1965-1980		
Children aged 6 to 11 years			Additional numbers of children reaching the age of 6			Total		
Boys	Girls	Total	B.	G.	Total	B.	G.	Total
1375	1344	2719	3835	3765	7600	5210	5109	10319

In 1965, the rate of school attendance in Sudan amounted to 25 per cent in the case of boys, and 15 per cent in that of girls. We propose, hypothetically, to lift the rate to 80 per cent in the case of boys and 40 per cent in that of girls for the period 1976-1980. This represents a fairly rapid rise in the rate of school attendance, which can probably not be exceeded until after 1980.

TABLE XII

SUDAN - Enrolment for primary education

(thousands)

	1965		1966-1970		1971-1975		1976-1980		1965-1980		
	Boys	Girls	B.	G.	B.	G.	B.	G.	B.	G.	Total
Numbers of children of school age	1375	1344	1100	1075	1275	1250	1460	1440	5210	5109	10319
Rate of school attendance	25%	15%	40%	20%	60%	30%	80%	40%	71%	37%	54%
Actual numbers enrolled	344	202	440	215	765	375	1168	576	2717	1368	4085

In order to determine the numbers enrolled for secondary and higher education, we shall establish, as we did for the Maghreb, the ratios of the numbers enrolled for these two levels of education to those enrolled for primary education in Sudan in 1964.

TABLE XIII

SUDAN - Enrolment at the three educational levels in 1964

(thousands and %)

LEVEL OF EDUCATION	Thousands	Percentage
<u>Primary</u>	<u>478</u>	<u>100,0%</u>
of whom girls	(32%)	
<u>Secondary - Total</u>	<u>96</u>	<u>20,1%</u>
of whom general	(89)	
technical,	(5)	
teacher training	(2)	
<u>Higher</u>	<u>5,9</u>	<u>1,2%</u>

Source: UNESCO Statistical Yearbook, 1965

Thus, in 1964, for every 1,000 pupils receiving primary education, there were 201 pupils receiving secondary education and 12 receiving higher education. We could, therefore, set as a target for secondary education in Sudan an increase in enrolment from 20.1 to 35 per cent of those enrolled for primary education in 1976-1980, and as a target for higher education an increase in enrolment from 1.2 to 5 per cent of those enrolled for primary education in the same period. It should be noted that the targets set for secondary and higher education in Sudan are higher than in the Maghreb: 35 per cent compared with 4 per cent, because primary school attendance in Sudan is proportionately less advanced.

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TABLE XIV

SUDAN - Enrolment for secondary and higher education

(thousands)

	1965	1966-1970	1971-1975	1976-1980	1965-1980
Enrolment for primary education	546	655	1140	1744	4085
Ratio secondary/primary	20%	25%	30%	35%	33%
Enrolment for secondary education	109	164	342	610	1225
Ratio higher/primary	1,25%	2,0%	3,5%	5,0%	3,5%
Enrolment for higher education	6,8	13,1	39,9	87,2	147,0

To sum up, we have compiled below the requirements in higher-level, medium-level and basic qualified staff, together with the numbers enrolled for higher, secondary and primary education in the Maghreb and in Sudan between 1965 and 1980.

TABLE XV

Maghreb and Sudan - Requirements in qualified staff and enrolment
for the three educational levels between 1965 and 1980

(thousands)

Requirements in qualified staff				Numbers enrolled for the three levels of education			
Qualified staff	Maghreb	Sudan	Total	Enrolment	Maghreb	Sudan	Total
Basic	1391	623	2014	Primary	14480	4085	18565
Medium-level	729	325	1004	Secondary	2828	1225	4053
Higher-level	145	68	213	Higher	321	147	468
Total	2265	1016	3281	Total	17629	5457	23086

In order to ensure that overall requirements in qualified staff should be covered by the secondary and primary levels of education, we propose the following consistency model (see page 21).

According to this model, higher education in the Maghreb should provide 145,000 higher-level staff. In other words, of the total number of 321,000 pupils enrolled, 145,000 should complete their higher educational studies, representing a percentage of successful students amounting to 45. The 55 per cent of drop-outs - 176,000 students in all - would be employed as medium-level staff.

Secondary education in the Maghreb should therefore provide 551,000 medium-level staff (the requirements being 729,000, of whom 176,000 would be covered by drop-outs from higher education), or 19 per cent of the numbers enrolled for secondary education. Moreover, 11 per cent of the numbers enrolled for secondary education, amounting to 321,000 pupils, should pass on from the

secondary to the higher level, representing a success rate of 30 per cent (19 + 11 per cent).

Seventy per cent of the drop-outs from secondary education, amounting to 1,391,000 pupils, would be employed as basic staff, i.e. 49 per cent of the total numbers enrolled for secondary education. Thirty per cent of the drop-outs from secondary education (i.e. 21 per cent of the total secondary school enrolment) numbering 565,000 pupils will constitute surplus qualified basic staff.

TABLE XVI

Consistency model showing requirements in qualified staff and output of the educational system

	Maghreb		Sudan	
	Numbers (thou- sands)	% of enrol- ment	Numbers (thou- sands)	% of enrol- ment
<u>Higher education</u>				
(1) Trained higher-level staff	145	45%	68	46%
(2) Drop-outs absorbed as medium-level staff	176	55%	79	54%
Total:	321	100%	147	100%
<u>Secondary education</u>				
(1) Trained secondary-level staff	551 ^(a)	19%	246	20%
(2) Pupils proceeding to higher education	321	11%	147	12%
(3) Drop-outs absorbed as basic staff	1391	49%	623	51%
(4) Surplus basic total staff (unskilled labourers)	565	21%	209	17%
Total:	2828	100%	1225	100%
<u>Primary education</u>				
(1) Pupils proceeding to secondary education	2828	19%	1225	34%
(2) Drop-outs and holders of CBR ^{1/} employed as unskilled labourers	12012	81%	2860	66%
Total:	14840	100%	4085	100%

(a) of the 729,000 medium-level staff required, less 176,000 constituted by the drop-outs from higher education.

1/ Certificat d'Etudes Primaires

Of the 14,840,000 pupils receiving primary education in the Maghreb, 2,828,000, or 19 per cent of the total, will proceed to receive secondary education. The drop-outs will amount to 81 per cent and, although they will be able to read and write, and will possess some qualifications, they will be employed as unskilled personnel owing to the lack of suitable employment.

As far as Sudan is concerned, the consistency model showing requirements in qualified staff and the output of the educational system resembles that for the Maghreb, but holds a small margin of advantage. In that country, secondary education throws up smaller surpluses: 17 per cent in Sudan compared with 21 per cent in the Maghreb. The same is true of surpluses arising from primary education: 66 per cent in Sudan compared with 81 per cent in the Maghreb.

The surpluses of qualified staff who have received secondary and primary education are to a large extent attributable to the fact that progress has been more rapid in the sector that includes education and training of staff than in the directly productive sector.

The problem will therefore not be one of postponing until a later date fulfilment of the desire to achieve generalized schooling of children reaching the age of 6, nor of reducing the ratio of numbers enrolled for secondary and higher education to those enrolled for primary education, in order to avoid training a surplus of qualified staff, but rather of ensuring that the trained staffs produced achieve the necessary standard and acquire the requisite special skills, particularly in the case of medium-level and higher-level staff.

For the immediate future, the most important task appears to be that of establishing a balance-sheet showing the resources in qualified staff, at present available and of providing medium-

term and long-term forecasts of future requirements in qualified staff that should be as precise and detailed as possible. On the basis of this balance-sheet and these forecasts, it will be relatively easy to direct pupils and students in the desired numbers towards the requisite types of training.

III - INVESTMENT IN TRAINING QUALIFIED STAFF BETWEEN 1965 AND 1980

It has proved difficult to settle upon a method of calculating the necessary investment involved in training qualified staff. In the absence of precise evaluations relating to the numbers of classes and laboratories, and to the amount of accommodation and equipment required (which would necessitate long and detailed studies carried out by a number of experts), we may resort to certain simple and rapid procedures.

The first of these procedures consists in calculating the amount of the investment per pupil (at all educational levels) during the last year for which figures are available.

The following Table shows that in 1962 or thereabouts, investment per pupil varied between US\$ 55 in Algeria and \$10 in Morocco, which gives an average figure of \$29 for the five countries taken together.

TABLE XVII
Educational investment per pupil

COUNTRY	Investment		Numbers enrolled at the three educational levels		Investment per pupil (\$)
	Year	\$ millions	Year	Numbers enrolled (thousands)	
Algeria	1961	48.8	1960	883	55
Libya	1960	2.2	1960	143	15
Morocco	1962	11.7	1963	1199	10
Tunisia	1964	14.2	1964	757	19
Maghreb		76.9		2982	26
Sudan	1962	23.1	1963	498	46
All 5 countries		100.0		3480	29

Source: UNESCO Statistical Yearbook 1965

In the Maghreb, therefore, an investment of only US\$ 522 million would be required for the 17,989,000 pupils and students receiving education during the period 1965-1980 (of whom 14,840,000 would be at the primary level; 2,828,000 at the secondary level; and 321,000 at the higher-level). This would represent per capita expenditure of \$29, or scarcely 1.6 per cent of the planned Gross Fixed Capital Formation.^{1/} That shows that this

^{1/} This GFCF may be estimated at \$39,675 million for the period 1964-1980, using as a basis the GFCF in 1964, 1970, 1975 and 1980 (see Evaluation of capital formation up to 1980, and its breakdown between the major economic sectors, by A. Ben-Amor, Tangier, June 1967, E/CN.14/INR/150, p.34).

method of calculation is not meaningful. The same calculation made for Sudan results in an investment of \$157 million, or 0.3 per cent of the total GFCF in 1965-1980, and confirms the fact that another method must be sought.

In Tunisia, according to the estimates given in the Perspectives Décennales de Développement (1962-1971)^{1/}, it would be necessary to invest Dinars 87,8 million at 1957 prices (or nearly \$203 million) to train 160,000 qualified staff (10,000 higher-level, 50,000 medium-level and 100,000 basic staff) or \$1,270 on an average per unit of qualified staff. As it would be necessary to train 3,281,000 qualified staff in the five countries, it may be seen that, if the same process of reasoning as that used in Tunisia were applied, it would be necessary to invest \$4,160 million or 10.5 per cent of the total GFCF in the five countries between 1965 and 1980. We arrive at a percentage that is very close to this, if we apply the estimates given in the Tunisian Four-Year Plan (1965-1968) to the five countries as a whole. According to the Four-Year Plan, it is necessary to invest the equivalent of \$16 million in order to train 4,000 higher-level staff; \$45 million to train 1,200 medium-level staff; and \$17 million to train 76,500 basic staff,^{2/} which works out at \$4,000 per unit of higher-level staff, \$3,750 per unit of medium-level staff and \$220 per unit of basic staff. As we must train 213,000 higher-level staff, 1,004,000 medium-level staff and 2,014,000 basic staff in the five countries, it is apparent that we should have to invest \$852 million, \$3,765 million and \$443 million in their respective training, which gives us a total of \$5,060 million or 12.7 per cent of the total GFCF.

1/ See Perspectives Décennales de Développement (1962-1971), pp. 56 and 314.

2/ Plan Quadriennal (1965-1968), Volume 3, pp. 30 and 272.

TABLE XVIII

Investment in training the requisite qualified staff between
1965 and 1980 in Algeria, Libya, Sudan and Tunisia

	Qualified staff requirements (persons)	Investment per unit of trained staff (\$)	Total investment (\$ million)
Higher-level	213,000	4,000	852
Medium-level	1,004,000	3,750	3,765
Basic	2,014,000	220	443
Total:	3,231,000		5,060

Thus, it appears that investment in the education and training of qualified staff should constitute between 11 and 13 per cent of GFCF.

ANNEX I - ALGERIA

Breakdown of establishments covered by the survey according
to branch of activity, legal status of the establishment
and region

Branch of activity	Legal status	Whole of Algeria	Algiers region	Oran region	Constantine region	Sahara region
11. Coal mining	Public	1	-	-	-	1
12. Extraction of metal ores	Public	7	3	1	3	-
13. Crude oil and natural gas	Private	30	13	-	1	16
14. Quarrying of stone for construction purposes, clay and sand	Managed by workers	8	4	1	3	-
	Private	5	1	-	4	-
	Public	2	1	-	1	-
	Total	15	6	1	8	-
19. Extraction of other non-metallic ores	Managed by workers	1	1	-	-	-
	Private	6	-	3	3	-
	Public	1	-	-	1	-
	Total	8	1	3	4	-
20. Food industries excluding manufacture of beverages	Managed by workers	28	11	14	3	-
	Private	27	14	9	4	-
	Public	58	12	30	16	-
	Total	113	37	53	23	-
21. Manufacture of beverages	Managed by workers	10	3	2	5	-
	Private	16	7	6	3	-
	Public	1	1	-	-	-
	Total	27	11	8	8	-
22. Tobacco industry	Managed by workers	1	1	-	-	-
	Public	4	3	-	-	1
	Total	5	4	-	-	1

Branch of activity	Legal status	Whole of Algeria	Algiers region	Oran region	Constantine region	Sahara region
23. Textile industry	Managed by workers	4	2	2	-	-
	Private	26	4	21	1	-
	Other	1	-	1	-	-
	Total	31	6	24	1	-
24. Manufacture of footwear and articles of wearing apparel; miscellaneous ready-made woven articles	Managed by workers	7	3	3	1	-
	Private	23	16	5	2	-
	Public	18	4	6	8	-
	Other	2	-	1	1	-
	Total	50	23	15	12	-
25. Timber and cork industry, excluding furniture industry	Managed by workers	9	1	3	5	-
	Private	26	13	4	9	-
	Public	1	-	-	1	-
	Total	36	14	7	15	-
26. Furniture industry	Managed by workers	5	6	1	1	-
	Private	6	3	-	-	-
	Total	11	9	1	1	-
27. Paper and board industry	Managed by workers	3	1	2	-	-
	Private	4	1	1	2	-
	Total	7	2	3	2	-
28. Printing, publishing, and allied industries	Managed by workers	5	2	-	3	-
	Private	2	1	1	-	-
	Public	11	5	3	3	-
	Other	1	1	-	-	-
	Total	19	9	4	6	-
29. Leather industry, fur industry and articles of leather and fur, excluding footwear and other articles of wearing apparel	Private	3	1	2	-	-
30. Rubber industry	Private	1	-	1	-	-
	Other	1	1	-	-	-
	Total	2	1	1	-	-
31. Chemical industry	Managed by workers	1	1	-	-	-
	Private	42	28	6	7	1
	Public	3	3	-	-	-
	Total	46	32	6	7	1

Branch of activity	Legal status	Whole of Algeria	Algiers region	Oran region	Constantine region	Sahara region
32. Industry of products derived from oil and coal	Private	1	1	-	-	-
33. Industry of non-metallic mineral products, excluding products derived from oil and coal	Managed by workers	42	20	9	13	-
	Private	25	7	11	15	2
	Public	4	1	-	3	-
	Other	1	1	-	-	-
	Total	72	29	20	21	-
34. Basic metallurgical industry	Managed by workers	2	1	1	-	-
	Private	10	5	2	3	-
	Other	1	1	-	-	-
	Total	13	7	3	3	-
35. Manufacture of metal products, excluding machinery and transport equipment	Managed by workers	1	1	-	-	-
	Private	13	10	1	2	-
	Total	14	11	1	2	-
36. Production of machinery, excluding electrical machinery	Private	12	7	1	3	1
	Public	1	1	-	-	-
	Total	13	8	1	3	1
37. Production of electrical machinery, appliances and equipment	Private	17	14	1	1	1
38. Manufacture of transport equipment	Managed by workers	4	2	1	1	-
	Private	11	6	2	2	1
	Public	4	1	-	1	2
	Total	19	9	3	4	3
41. Electricity, gas and steam	Private	2	-	-	1	1
	Public	64	21	13	22	8
	Total	66	21	13	23	9
42. Water and sanitary services	Private	6	2	3	-	1
	Other	1	-	-	-	1
	Total	7	2	3	-	2
50. Building industry	Managed by workers	15	7	1	5	2
	Private	37	16	6	6	9
	Public	3	1	-	1	1
	Total	55	24	7	12	12

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Branch of activity	Legal status	Whole of Algeria	Algiers region	Oran region	Cons-tantine region	Sahara region
51. Public works	Managed by workers	12	6	2	3	1
	Private	58	18	13	13	14
	Public	10	1		1	8
	Other	3	2		1	-
	Total	83	27	15	18	23
61. Wholesale and retail trade	Managed by workers	25	10	5	10	
	Private	110	74	17	16	3
	Public	20	10	4	5	1
	Other	7	2	1	3	1
	Total	162	96	27	34	5
62. Banks and other financial institutions	Private	25	13	9	3	-
	Public	9	6	1	2	-
	Other	1	-	-	1	-
	Total	35	19	10	6	-
63. Insurance	Private	6	5	-	1	-
	Public	7	7	-	-	-
	Total	13	12	-	1	-
64. Real estate	Managed by workers	1	1	-	-	-
	Private	4	3	-	1	-
	Public	3	2	-	-	1
	Other	1	-	1	-	-
	Total	9	6	1	1	1
65. Hotel industry	Managed by workers	9	6	1	2	-
	Private	4	2	-	1	1
	Public	4	1	-	3	
	Total	17	9	1	6	1
71. Transport	Managed by workers	23	9	6	3	5
	Private	25	17	6	10	2
	Public	22	8	7	6	1
	Total	80	34	19	19	8
72. Warehouses and stores	Managed by workers	2				
	Private	4	1	1	2	
	Public	1			1	1
	Other	2	1	1	1	
	Total	9	2	2	4	1
83. Services provided for enterprises	Private	1	1	-	-	-
84. Recreational services	Private	11	1			
	Public	152	6	92	48	6
	Total	153	7	92	48	6
Total: all branches of activity	Managed by workers	218	99	54	60	8
	Private	599	305	132	105	54
	Public	411	98	157	126	30
	Other	22	9	5	6	2
	Total	1250	511	348	297	94

Source: Résultats de l'enquête semestrielle sur la situation de l'emploi au printemps 1966, Algiers, Sous-direction des statistiques.

ANNEX II - ALGERIA

Breakdown of qualified staff on 30 April 1966

<u>Basic staff - Total</u>		<u>33,894</u>
of whom		
(1) Specialist workers	Algerians (male)	20,223
	Expatriates (male)	296
	Algerians (female)	1,697
	Expatriates (female)	59
(2) Subordinate office employees	Algerians (male)	9,257
	Expatriates (male)	324
	Algerians (female)	1,322
	Expatriates (female)	716
<u>Medium level staff - Total</u>		<u>20,632</u>
of whom		
(1) Skilled craftsmen	Algerians (male)	9,147
	Expatriates (male)	609
	Algerians (female)	139
	Expatriates (female)	31
(2) Subordinate staff (foremen and overseers)	Algerians (male)	7,819
	Expatriates (male)	2,533
	Algerians (female)	112
	Expatriates (female)	242
<u>Higher level staff - Total</u>		<u>2,573</u>
of whom		
(1) Managerial staff	Algerians (male)	620
	Expatriates (male)	432
	Algerians (female)	3
	Expatriates (female)	9
(2) Administrative staff	Algerians (male)	475
	Expatriates (male)	478
	Algerians (female)	4
	Expatriates (female)	25
(3) Technical staff	Algerians (male)	79
	Expatriates (male)	444
	Algerians (female)	1
	Expatriates (female)	3

Sources: Résultats de l'Enquête semestrielle sur la situation de l'emploi au printemps 1966 - Algiers, Sous-Direction des Statistiques.

ANNEX III - SUDAN

ROUGH ESTIMATE OF ADDITIONAL MANPOWER REQUIREMENTS
FOR PLAN PERIOD IN THE MODERN PART OF THE ECONOMY

(1000 persons)

	T E C H N I C A L				Total
	Manage- rial, profes- sional, sub- profes- sional	Skilled crafts- men, drivers	Semi- skilled, un- skilled	Adminis- trative, clerical, all levels	
1. Modern agriculture and forestry.....	1.3	3.0	345.0	10.0	359.3
2. Industry (manufac- turing, public utilities, construction).....	5.0	22.8	92.7	12.0	132.5
3. Transport, communications and distribution.....	1.0	13.5	19.0	41.7	75.2
4. General adminis- tration, social services, education, banking, others...	-	-	-	25.1	25.1
GRAND TOTAL	7.3	39.3	456.7	88.8	592.1

Source: The Ten-Year-Plan of Economic and Social Development 1961/1962-1970-1971, p.56.

ANNEX IV - LIBYA

Estimated demand for and supply of personnel during 1964-1969

Educational level	Demand for personnel			Supply of personnel (including Libyans studying abroad)	Shortage	
	Government sector	Private sector	Total		Govt. sector (assuming the entire supply is absorbed in Govt.) (Col. (2)-(5))	Overall (Col. (4)-(5))
(1)	(2)	(3)	(4)	(5)	(6)	(7)
University	2,514	2,540	5,054	1,841	673	3,213
Secondary school	10,459	3,898	14,357	7,171	3,288	7,186
Below } Skilled	8,325	5,484	13,809	2,210	6,115	11,599
Secon- } Un- dary } skilled	3,934	-	3,934	adequate	-	-
Total	25,232	11,922	37,154	11,222 ^x	10,076	26,998

^x Excluding unskilled

Source: Survey of requirements of professional, technical and skilled manpower in Libya, 1964-1969, by A.N.K. Nair - Tripoli, October 1964.

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