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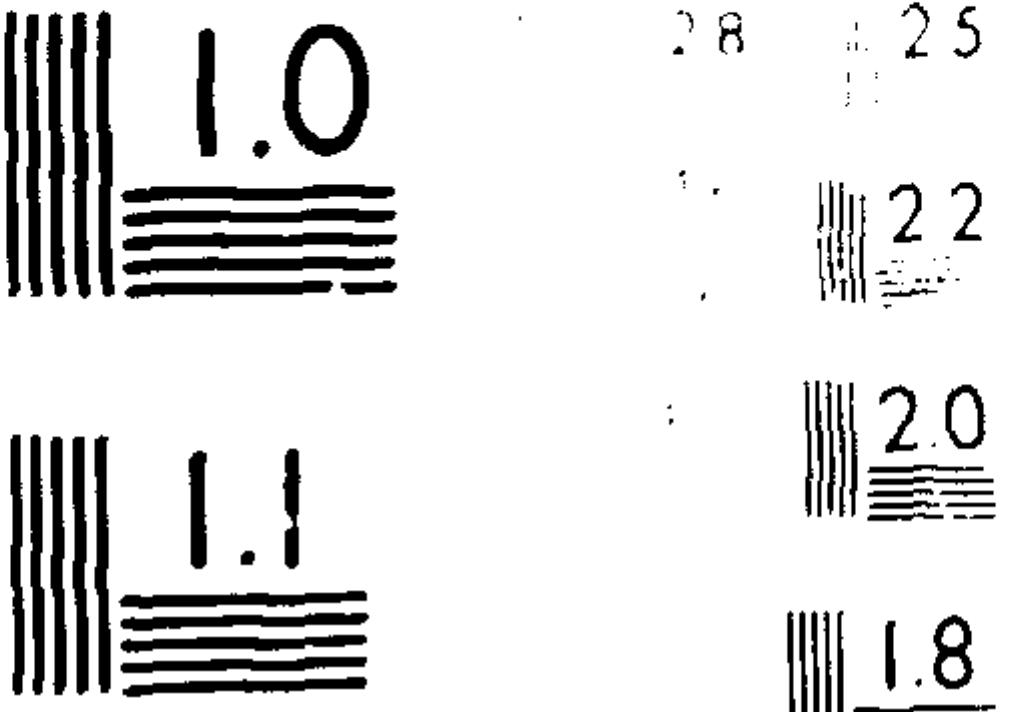
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The Case of Egypt *

by

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56

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Note

Throughout this report, all figures given in Egyptian pound (LE) are converted at the official exchange rate provided by the International Monetary Fund in its International Financial Statistics. Thus the exchange rate of LE1=$2.55 is used for data between 1970 and 1978. For 1979-82, the rate of LE1=$1.43 is used.

TABLE OF CONTENTS

PREFACE

Egypt has played a very vital role in the political economy of the Middle East and the Third World for a long time. The present study highlights one more form of this interdependence between Egypt and its Middle Eastern and African neighbours. It is one of the case studies undertaken at UNIDO's initiative to take stock of the extent to which complementarities exist, in search of ways to reinforce them.

While pursuing its mandate of strengthening the industrial and technological bases of the developing countries, UNIDO selected, appropriately, Egypt as its Middle Eastern case study. It is hoped that the cumulative results of the case studies will shed needed light on the process of technology transfer among the less industrialized countries, thus providing guidelines for action at the corporate, national and international levels.

Chapter I

INTRODUCTION

1. Background

In the last two decades, the international market for technology has undergone major transformations. The dynamics of technological change, the growth of many Third World countries and thus their more extensive integration into the global economy, and the emergence of non-conventional sources of technology have been among these transformations. Along with these changes have come a number of major international attempts to propel these changes in a direction more advantageous to the less industrial countries. These attempts have included the NIEO Declaration and Programme of Action in 1974 and the Lima Declaration of 1975. Both of these placed heavy emphasis on accelerating the economic development of LDCs by inter alia, promoting economic and technological cooperation as well as collective technological self-reliance[1] among them.

In recent years, those keen on monitoring the progress in the above areas have devoted increasing attention to the various manifestations or indicators of economic and technical cooperation among the developing countries. One of these manifestations is the emergence of the Third World multinationals, and such works as Kumar and McLeod [22] and Wells [40]. The other, even more

recent, is a series of studies on the transfer of technology from the developing countries. Mostly under UNIDO and World Bank auspices, these include the works of Lall on India [24], O'Brien and Mankiewicz on Portugal and Argentina [29], and Dahlman and Westphal and their associates on Mexico and other Latin American countries [11].

All these studies have at least one thing in common. They zero in on specific cases to highlight in more detail what international economists like Balassa [5] and studies such as the U.S. Labor Department's report on U.S. competitiveness [39], UNCTAD [36a] and the World Bank [48] have shown at the aggregate international level, namely the changing structure of the international economy. One of these changes has been an increasing share which the Third World has acquired in international trade in goods and services. No doubt this increased role should not be exaggerated; the OECD countries still remain by far the most important partners in international trade. They will remain to be dominant well into the next century.

The fact still remains, nonetheless, that developing countries - primarily the newly industrialized countries, but also those not commonly grouped with the NICs, such as Egypt - have found for themselves an increasingly important niche. Many of them have come to the painful realization that import-substitution industrialization (within walls, protected by factor-

distorting measures) is inadequate beyond a certain point and must be followed by the gradual openning up of the domestic industry to international competition - either by relaxing rules of entry into the market or allowing and encouraging domestic firms to compete in international markets. In this quest, LDCs have been assisted not only by the changing dynamics of the international market - explainable in part through the product life cycle hypothesis - but also international "affirmative action" types of measures intended to accelerate the process.

A variety of arguments can be marshalled in support of such efforts. To focus on technology alone, let us recall the vast literature in technology transfer[2] on the specific topic of "appropriateness". There is ample reference to "appropriate technology" - that which makes most efficient use of a country's factor endowments and is most appropriate in factor mix, scale, price, and compatibility with social objectives and tastes.[3]

Appropriateness as an issue in the technology transfer literature grew out of the dissatisfaction and disenchantment felt in the Third World with Western technology. The technology marketplace was supplied with technologies originating in the West and - true to form - reflecting the needs and factor intesities of those societies.

When, in 1974, the NIEO Declaration was adopted, one component of the Action Programme was the strengthening of the

technological capabilities of the developing countries by, inter alia, promoting technical (and, more generally, economic) cooperation among the developing countries. The following year, the Lima Declaration further emphasized technical cooperation among the developing countries (TCDC) and economic cooperation among the developing countries (ECDC).

Efforts, since then, have focused on indentifying instances where technology exports from developing countries are taking place, as well as discovering the potentials where they have not yet occured. Egypt is one country which has both some experience in as well as the potential for transfering technology and know-how. Thus the present project.

2. Purpose, Scope and Method

The general objective of the project is to carry out a detailed survey of technology[4] exports from Egypt. More specifically, this study provides a survey of exports of technology (in the form of know-how, patents, consulting and engineering services, and skilled manpower) by type, extent, direction (destination), motives, and consequences to the Egyptian economy. It will also examine policies and conditions which may promote technology exports from Egypt. Policy conclusions will be drawn for the Egyptian government and other developing countries as well as for UNIDO.

The project was prompted by UNIDO's desire to promote economic and technical cooperation among the developing countries, in pursuit of its mandate under the NIEO and Lima Declarations and other international measures.

The scope of our study is limited to Egypt since about 1970. The data was gathered during field research in Egypt in January and May of 1982. Both private and public sector companies were interviewed, as well as government officials and experts on the Egyptian economy. A questionnaire was used in the interviews with the sample of organizations. See Appendix 1. A variety of published and unpublished material in English and Arabic were also utilized. Before reporting the results of our survey, we shall provide a broad-brush portrait of the Egyptian economy.

FOOTNOTES

[1] On the concept of collective self-reliance, see the Arusha Programme for Collective Self-Reliance [ ]. For a recent UNIDO effort towards the achievement of these objectives, see UNIDO 1981 [ ].

[2] For an extensive reference source, see Sagafi-nejad and Belfield. See also Contractor and Sagafi-nejad [ ] and Sagafi-nejad and Contractor [ ] for a review of the literature.

[3] In an absolute conceptual sense, technology is said to be "appropriate" if it maximizes societal objectives given the factor endowments and capabilities of that society. However, "appropriateness" is situational, relational, and dynamic. Good surveys and definitions of the concept include Jequier, 1976 [ ]; Ranis, 1979 [ ]; and UNIDO, [ ]. For a lucid analysis of value dilemmas facing many LDCs in selection of sometimes inappropriate technology, see Goulet, 1977 [ ].

[4] In this study, technology is defined in its broadest sense, to include organized knowledge for production, embodied in products, processes or people. For a review of various definitions, see Perlmutter and Sagafi-nejad [ ], pp. 5-8.

Chapter II

THE EGYPTIAN ECONOMY

1. Background

Egypt has been endowed with very few short-cuts to development. It is nearly twice as large in territory as France; but 96% of the land is arid. Thus the Nile strip, and its delta, have been the center of 98% of the population and economic activity through the ages. It has a rapidly growing population, concentrated in limited space, and is feeling the incessant pressure for increase in output and industrialization.

But Egypt is also a resilient society, heir to a great and ancient civilization, and determined to pull itself up by its bootstraps. Furthermore, Egypt is a forerunner in industrialization relative to nearly all other Middle Eastern countries. And, being an integral part of the Arab World, with a large population and a sizeable industrial capacity and skilled work force, it is in a position to respond to the rapidly increasing demand of the oil-rich Middle Eastern countries for a vast array of goods, services, and manpower.

As will be seen later, the cultural and political ties between Egypt and the rest of the Arab World have not always resulted in the anticipated mutual gains. The relationship, undoubtedly, has been subject to fluctuations. But there has remained a persistent pattern of give-and-take which has withstood

the political fluctuations. This is in the main part due to Egypt's relatively advanced stage of economic development in the Arab world.

Egypt's history of attempts at industrialization[1] dates back to the early 19th century when, under the leadership of Mohammed Ali, a big push toward the establishment of state-owned industry was made. The momentum begun by Mohammed Ali, however, started to dissipate after him and by the middle of the last century, Egypt's economy had retrogressed toward stagnation. Toward the end of the 19th century, some new attempts got under way towards industrial development under the exported growth strategy of the British who had colonialized Egypt.

Between the 1890s and the 1920s, limited, lop-sided, foreign-dominated and export-dependent industrialization took place. During the 1930s, and up to the 1952 revolution, independent Egypt embarked on import, substitution industrialization. For example, the state, through Bank Misr, established several public sector industrial firms. A number of protective measures, such as tariffs and subsidies, were also introduced to protect the domestic industries.

With the advent of Arab socialism brought on by President Nasser and the 1952 revolution a new impetus was provided for state-led industrialization. Many new industries were established,

primarily with Eastern bloc technology and assistance, and, in 1961, nearly all private enterprises were nationalized.

State's near-exclusive role in industrialization continued into the 1970s. However, since the death of Nasser in October of 1970, and the succession to power of Anwar Sadat, major shifts in policy were initiated, culminating, in 1974, in the enactment of Law 43 and other economic liberalization programs collectively referred to as Infitah - the Open Door.

The primary objectives of the Open Door policy have been to re-orient Egypt's economy in several aspects. In its external dimension, there has been a major re-direction toward the West, indicated by, among other things, the destination of Egypt's merchanise trade, as can be seen in Tables 3-5 in Appendix 2. Egypt has attempted to encourage the inflow of investment and technology from abroad, primarily Arab and Western sources. This, too, is evident from the much enlarged inflow of external capital. Table 7 in Appendix 2 shows an increase from $302 million in 1970 to $2,982 in 1930. In terms of the sectoral distribution of production, the goal has been to stress and strengthen the role of the private sector. But their relative share has remained unchanged, as can be seen from Tables 9 and 10 in Appendix 2.

When President Mubarak was sworn into office in October of 1981, after President Sadat's assassination, he reaffirmed the continuity of the Open Door policy. However, he also attempted to

modify the policy so as to direct it away from encouraging consumption and more toward production. Thus in his speech to the People's Assembly in November of 1981, Mubarak put forth his overall objectives for the Egyptian economy:

1. Our first responsibility during peace is the placing of the Egyptian economy on a solid basis in order to achieve our ambitious aims. Our success largely depends on tackling the economy.
2. We will not withdraw from the Open Door directed towards production. It must be mainly directed towards producing the basic needs of the masses.
3. Social justice is the basic condition for peace and stability. The objective is the realisation of a society of purity and justice and not one wracked by advantages and class divisions.

The seven essential points defined by Mr. Hosni Mubarak to achieve these objectives are:

1. The rationalisation of consumption and the direction of local savings towards productive activity.
2. A radical solution for the housing problem.
3. To ensure that subsidized goods are used by those who are intended to be served by them.
4. To eradicate luxury and extravagant public and private spending, but without repressive measures harmful to the economy.
5. To deal with the present shortage in skilled and trained labour.

6. To revise the import policy.

7. To boost and strengthen the public sector, the mainstay of industry.[2]

These points, and subsequent policy measures taken by the government, signify the sense of urgency with which persistent problems of the Egyptian economy must be tackled in the 1980s. Below we provide a brief analysis of the present structure of the economy.

2. Basic Characteristics of the Economy

Despite the head start and significant industrial accomplishments, Egypt's economy is burdened by a variety of obstacles. Egypt has not been heavily endowed with natural wealth. Two of its most important resources are its rich history and The Nile. The first provides great potential for tourism, and the second has nourished a civilization for at least six thousand years. And, in parts of Egypt, not much has changed during this time.

Egypt's meager resources have been burdoned by successive wars and the ensuing military build up as well as an unabating population increase. Consequently, Egypt has been suffering from a chronic balance of payments deficit and foreign exchange shortage. During 1979/80 and 1980/81, the country had merchandise trade deficits or LE 2,726 million and LE 2,966.4 million, respectively,

as can be seen in table II. 1. Basic data on the Egyptian economy is provided in Table II. 2 as well as in Appendix 2 Tables.

Table II. 1

Egypt's Merchandise Trade Balance 1979/80-80/81

(LE Million)

	Imports (CIF)	Exports (FOB)				Balance (-)
		Petro.	Cotton	Other	Total	
1979/80	5,095.9	1,497.0	255.5	617.4	2,369.9	(2,726.0)
1980/81	5,998.2	1,919.4	217.5	894.9	3,031.8	(2,966.4)

Source: Central Bank of Egypt, Annual Report 1980/81 (Cairo, (1981), p. 19.

Manpower, to be discussed in Chapter IV below, petroleum, and cotton have been the most important sources of foreign exchange - excluding foreign aid. See, in particular, Tables 11-13 in Appendix 2 for comparative data on Egypt and other countries.

Table II. 2

Egypt: Basic Data

GNP(1980) estimated	$ 23,429 million
GNP per capita	550
Average annual GNP growth rate (77-80)	8-9%
Population (February 1981)	43 million
Annual population growth rate	2.9%
University enrollment (1978-79)	487,000
Population density (15,000 sq. mile inhabited area)	2,860
Land area	1,002,000 sq. km.
% of land area under cultivation	4%
Total road miles	16,000 (paved & unpaved)
Exports f.o.b. (1980)	$ 3,854 million
Imports c.i.f.	$ 7,566 million
Balance on trade account	$ -3,712 million
Total GOE budget (1980-81)	L.E. 8,670 million
% allocated for investment	37%
Total GOE debt (1979)	$ 15 billion
Debt service ratio (1979)	15%
Total foreign assistance (1980)	$ 2,090 million
% U.S.	52%
Current* petroleum production	650,000 bbl/day
Est. 1981 petorleum production	32 million tons
1980 net foreign exchange revenue from petroleum sector	$ 2,600 million

Source: The American Embassy in Cairo, with data from the Government of Egypt (GOE), Central Bank statistics, IBRD and IMF statistics on GOE economy, USAID statistics and estimates. Figures are calculated at the official exchange rate of L.E. 1 = $1.43.

*April 1981

In 1980, there were about 39.8 million Egyptians, as seen in Appendix 2, tables 1-13. The early 1981 estimates placed the figure at 43 million. In 1980 about 50 of the labor force was employed in agriculture, down from 58% in 1960. GNP per capita, $480 in 1979, reached $580 in 1980. The gross national product grew at a rate of 8 to 9% between 1977-80. And GNP per capita grew at a respectable rate of 3.4% per year between 1960 and 1980 a rate comparing favorably with some other countries with similar conditions. Growth rates of GNP, industry and manufacturing were impressive at 7.4%, 6.8% at 8.0% per annum during the 1970-79 period. The agriculture's share in GDP decreased from 30% in 1960 to 23% in 1979, while that of industry rose from 24% to 35% and that of manufacturing (sub-sector of industry) increased from 20% in 1960 to 28% in 1979.

3. The Structure of Industry

The share of manufactured products[3] rose from 12% of Egypt's merchandise export in 1960 to 21% in 1979. This signifies two points. First, manufactured goods are not a major export item, but, secondly, the relative importance of manufactured goods in the composition of Egypt's exports are on the ascent.

In terms of private vs. public sector distribution of production, there appears to have been practically no change at least during 1969/70 and 1977. Table 10 in Appendix 2 given gross value of industrial production. Table 10 in Appendix 2 provides

public and private sector's shares in production, broken down by type of activity in 1970/71 and 1977. Data in these two tables supposedly pertain to the same entities. However, they are not fully compatible. One conclusion which derives from Table 9 data is that there was no change in the private-public sector composition of industrial production. Public sector's production was 74.2% in 1969/70, and 74.8% in 1974. However, according to Table 10 , the public sector's share of manufacturing, was LE 1,415 million or 25.9% of total production in 1970/71. While actual production increased to LE 2,714 million in 1977, it constituted only 21.5% of total production. These figures, nonetheless, do prove the dominant position of the public sector firms. Private sector share in manufacturing was LE 787.1 million in 1970/71, or 14.4% of total production. In 1977, the sector's share was LE 1,517 million, or 12%.

4. Public Sector

Thus the dominant role of public sector enterprises persists despite attempts to expand the private sector. The public sector companies, estimated at about 200, are supervised by various ministries, depending on their field of authority. By far the largest number of industrial firms were operating under the Ministry of Industrial and Mineral Wealth, in a special section called General Organization for Industrialization (GOFI).

Numbering 116, these companies produced LE 1,606 million in 1975, LE 2,798 million in 1979, and LE 3, 359 million in 1980. Their exports in those same years amounted to LE 143 million, LE 384 million, and 449 million respectively. Given that Egypt's GDP at factor cost was LE 15,639 million in 1980, GOFI companies share would amount to a substantial 21.5%. Also, that same year, Egypt exported LE 2,695 million. Thus at LE 448 million, GOFI companies share would amount to 16.6%.

In terms of employment, GOFI companies employed a total of 572,225 persons in 1980. Given a total labor force of 13.8 million (FET, 1981), GOFI employs only 4.1% of the work force.

Since these companies represent about 60% of the public sector firms,[4] and because of their importance in a multitude of ways explored above, a detailed breakdown of their production and export for the years 1975, 1979 and 1980 as well as employment figures for 1980 are presented in Appendix 3, Table 1 and in Charts 1 through 5. A summary table is also provided below Table II. 3.

Table II. 3.

Summary of Production, Export and Employment Statistics: GOFI Companies*

	1975		1979		1980		
Sector	Production	Export	Production	Export	Production	Export	Employment
I. Food Industry	630	28	895	34	1,070	36	86,329
II. Textile & Weaving	476	87	843	193	1,022	232	294,120
III. Chemical	170	1	297	7	396	8	54,729
IV. Metallurgical	141	6	340	78	444	98	55,730
V. Engineering	163	18	382	68	376	68	60,109
VI. Mining	8	0.8	10	3	14	5	9,055
VII. Refractory	17	.9	32	.3	38	.1	12,153
Total*	1,606	143	2,798	384	3,359	449	572,225

*Production and Export Figures are in LE millions. Amounts are rounded off.

Government-owned companies dominate not only the domestic economy but also the external dimension, not only due to sheer size but also because, as arms of the government, they are less immune from non-economic influences. This includes the use of public-sector firms as instruments of foreign policy. As our case studies in Chapter V as well as the aggregate data from the interviews in Chapter III will show, such instances are not infrequent. But many firms have internationalized on their own and because of the particular firm-specific advantage they have possessed.[5] We now turn to an in-depth analysis of our survey and its results.

FOOTNOTES

[1]For excellent analyses of Egypt's early industrialization, see Hansen and Marzouk [ ], Mead [ ], Cooper and Alexander [ ]. Egypt's contemporary economy is analyzed by, among many, Mabro [ ]. Mabro and Andwan [ ], Hansen and Nashashibi [ ], Hansen and Radwan [ ] and studies by Abdel-Khalek [ ], Amin [ ], and Ayubi [ ] in Kerr and Yassin [ ].

[2]See Le Journal d'Egypt, special issue on the Open Door, (December 1981), p. 5.

[3]Non-primary commodities, namely textile and clothing, machinery & transport equipment, and other manufactures: See Table 3 in Appendix 2.

[4]See O'Brien, 1980 [ ].

[5]For an application of the eclectic theory of international economic involvement to firms from the Third World see Dunning [ ].

CHAPTER III
SURVEY RESULTS

1. Introduction

In this chapter we present a set of hypotheses based on what we know about Egypt's contemporary political economy and the technology transfer literature, presented in the preceding two chapters. We then describe the sample and the basic properties of our data, in the course of which the nature, extent and direction of Egypt's technology exports as well the validity or refutation of the hypotheses will be illucidated.

2. Some Hypotheses

The present study has aimed at providing not only a survey of the nature and orders of magnitude, but also of the factors and relationships that underlie technology exports from Egypt. The following are the seven primary working hypotheses which guided our analysis:

1. The dominant mode of technology transfer from Egypt involves primarily person-embodied technology.
2. The primary motive of the Egyptian firms in transferring technology abroad is more often political-cultural than economic-business.
3. The advantages of Egyptian over non-Egyptian firms is more likely to be political, cultural or commercial ties than other advantages.

4. Foreign firms receiving technology from Egypt are more public rather than private sector firms.
5. When exported, technology undergoes minor adaptation compared to in-house technology.
6. Exported technology is less likely to be more sophisticated than in-house technology. It is more often less or as complex.
7. Total export performance and technology export of a firm are related. Thus the higher the export-to-production ratio, the higher the level of technology export by a firm.

Given these hypotheses, we now examine our survey data by first looking at the sample, then the results.

3. The Sample

A total of 23 organizations were interviewed. Their names and some other general characteristics are provided in Table III.1.

Table III.1

Of these 23 entities, 21 were companies. Two, the Egyptian International Centre for Agriculture, and the National Research Center, are not companies. Four of the other 21 were private companies, with the other 17 being public sector enterprises. Twelve of the latter were selected from among the companies working under the general supervision of the Ministry of Industry and Mineral Wealth's General Organization for Indus-

Table III.1

OVERALL INFORMATION ON COMPANIES INTERVIEWED

Name of Company	Ownership	Main Activity	Year Established	Employees	Annual Turnover (U.S. $ mill.) 1979	1981	Total Exports 1979	1981	Main Technological Exports	Destination(s) of Technological Exports
1) Shawki & Co.	Private	Accounting and Mgt. Consulting Services	1940	130 (1981)		.65[1]	.26	.30	Mgt. consulting, accountants, training	Kuwait, rest of Third World
2) Engineering & Industrial Design Development Center (EIDDC)	Public	Training in Industrial design and Engineering	1968	453 (1981)		.75[2]	--	--	In-plant training, prototype development	Syria, Iraq, Tanzania
3) Societe des Sucreries et de Distillerie d'Egypt	Public	Manufacturing of sugar, bagasse pulp, alcohol, cosmetics, adhesives, machinery factory for foundry and steel construction	1855		156.0[3]		28.84[4]		Patents, know-how engineering, technical assistance, labor supply, feasibility technical & engineering studies	Europe, Sudan, Morrocco, Iraq, Oman, Other African and Third World Countries
4) Erection and Industrial Services Co. (Eriscom)	Public	Engineering services erection of mechanical and electrical projects	1974	28,000 (1981)	8.5	9.42	.89	1.55	Engineering services, technical assistance	Iraq
5) El Nasr Automotive Mfrg. Co.	Public	Automotive Assembly	1958	9.700 (1981)	148.7	153.0	0	0	Training for after-sale service	Iraq, Kuwait, Lybia, Algeria
6) Helwan Machine Tools Co.	Public	Machine tools, production, engineering, and technical services	1960						Technical assistance	Iraq
7) General Company for Paper Industry (RAKTA)	Public[5]	Pulp, paper, and board manufacture	1958	2,157 (1981)	26.80	30.79	0	0	Paper mills, chemical waste recovery	Iran, Iraq, Pakistan
8) El Nasr Salines Co.	Public	Salt mining and processing	1850		6.64				Consulting, engineering, technical assistance, turnkey plants	Iraq, Saudi Arabia, Yemen (North and South), Lybia, Cameroon, Sierra Leon, Nigeria

Table III.1 (cont.)

OVERALL INFORMATION ON COMPANIES INTERVIEWED

Name of Company	Ownership	Main Activity	Year Established	Employees	Annual Turnover (U.S. $ mill.) 1979	1981	Total Exports 1979	1981	Main Technological Exports	Destination(s) of Technological Exports
9) Egyptian Iron and Steel Co.	Public	Steel products	1954	25,400 (1981)	170.88	235.59	.625	.820	Technical assistance, skilled labor	SaudiArabia, Somalia, Kuwait, Qatar, Morocco, Syria
10) Misr Spinning and Weaving Co. (Mahalla)	Public	Textiles, spinning and weaving		20,000+ (1981)	212.2		59.61		Technical assistance, consulting, training, management services	Saudi Arabia, United Arab Emirates, Bahrain, Qatar, Jordan, Iraq, Sudan, Morocco
11) Kahira Pharmaceuticals Co.	Public	Pharmaceuticals							Technical assistance, turn-key plant	Iraq, Lybia
12) Business Services International	Private	Personnel recruitment and other services for int. firms	1980	NA	NA	NA	NA	NA	Recruiting skilled manpower, esp. medical staff	Saudi Arabia
13) General Organization for Gov't Printing Offices	Public	Printing and Publishing	1820	3,750 (1980) 3,500 (1981)	10	9.3	NA	NA	Training of foreign workers	Trainees from Saudi Arabia, Kuwait, Qatar, Jordan, Iraq, Sudan, and Lybia
14) The Egyptian Mechanical Precision Industries Co. (SABI)	Public	Home, Industrial, and corporation related material (zip fasteners, bathroom fixtures, hinges, locks, spark plugs . . .	1960	2,152 (2,090)[6] (1980) 2,127 (1981)	8.3	13.3	.243	.060	Training of foreign workers	Trainees (5 in all) from Holland, Jordan, Tunesia
15) The Egyptian International Center for Agriculture	Public	Agricultural training	1965	NA	NA	NA	NA	NA	Training	

Table III.1 (cont.)

OVERALL INFORMATION ON COMPANIES INTERVIEWED

Name of Company	Ownership	Main Activity	Year Established	Employees	Annual Turnover (U.S. $ mill.) 1979	1981	Total Exports 1979	1981	Main Technological Exports	Destination(s) of Technological Exports
16) Delta Consulting, Ltd. Inc.	Private	Management consulting	1975	23 (1981)	--	0.25	0.1	--	Management Consult-Services	Saudi Arabia
17) Electrocable Egypt	Public	Manufacturing wires and cables	1956	3,000 (1981)	--	--	--	--	Technical skills, training	Libya, Saudi Arabia
18) The Arab Contractors (Osman Ahmed Osman & Co.)	Public	Construction, Agro-business, Industrial activities	1951	40,000 (1980) 44,000 (1981)	570	700	--	--	Consulting engineering, Management turn-key plants	Saudi Arabia, Kuwait, Iraq, Libya, Sudan, Jordan, Oman
19) Nasr Boiler Company	Public	Manufacturing boilers and Pressure Vessels	1962	--	--	--	--	--	--	--
20) Center for Planning and Architectural Studies	Private	Training, Architecture, Planning, Publishing	1980	20 (1980) 35 (1981)	0.05	0.15	--	--	Architectural Services, Training	Saudi Arabia
21) SEMAF	Public	Manufacture of railroad cars	1955	2,700 (1980) 3,017 (1981)	40	582	--	--	Engineering drawings, Training	Rumania, Sudan, Syria, Ghana, Pakistan
22) El Nasr Forging Co.	Public	Manufacture of forgings	1961	1,770 (1980) 1,843 (1981)	5.787	8.414 (1980)	--	--	Training of industrial workers, trained manpower	Western Europe, Saudi Arabia, Kuwait, Iraq, Bahrain, Qatar, UAE, Sudan, Nigeria, Somalia, Tanzania, Tunesia, Poland, Yugoslavia
23) National Research Center	Public	Research and Training	1956	3,475[7] (1980)	--	--	--	--	Training, Trained manpower	Saudi Arabia, Iraq, Libya, Algeria, Kuwait, Yemen, Oman, Qatar, UAE, Jordan, Sudan, Kenya, Pakistan, Africa

Table III.1

NOTES

[1]Billings. The company's activities are management consulting and accounting series.

[2]Budget.

[3]Production, 1979, in EL, converted at the official exchange rate of LE 1 = $1.43.

[4]EL converted at EL 1 = $1.43. Source: GOFI.

[5]However, about 15-16% of equity held by private sector.

[6]Source: GOFI.

[7]Source: Ingazat Al-Markaz Al-Ghawmi Al-Bohooth Fi Rob-e' Gharn (NRC's Accomplishments of a Quarter Century) (Cairo: NRC, 1981 in Arabic,) p. 21.

trialization (GOFI), which supervises the activities of some 115 companies in different sectors ranging from food and chemical to textile, metallurgical and engineering activities. In the previous chapter we presented the production and export performance of GOFI's companies. Suffice it to say here that the companies were included in our survey at GOFI's suggestion, under the premise that they were the most likely or most evident exporters of technology, know-how or skilled manpower from Egypt. The five non-GOFI public sector companies included a pharmaceutical firm, two training centers, one printing press plant, and one machine tools company.

Other basic properties of the sample include data on the year established, production and exports for 1975, 1979, and 1980, and the number of employees for 20 of the sample firms. These are presented in Table III.2.

Table III. 2

As shown in Table III.2 three of the firms we interviewed were established in the 19th century-- testimony to the point made earlier in this report regarding the early history of industrial activity in Egypt. In 1980 production, our sample ranges from LE 35,000 to LE 490 million. Employment in the same year ranged from 20 to 40,000 and merchandise exports from 0 to

TABLE III.2

PRODUCTION, EXPORT AND EMPLOYMENT DATA ON THE SAMPLE FIRMS

CASE	YEAR ESTAB-LISHED	1975 PRO-DUC-TION	1975 EXPORTS	1979 PRO-DUC-TION	1979 EXPORTS	1980 PRO-DUC-TION	1980 EXPORTS	1980 EMPLOYEES	TECH. EXPORT INTEN-SITY
1	1940	.	296	.	182	.	196	110	M
2	1968	0	0	690	0	618	0	423	L
3	1855	86,244	21,705	109,147	20,167	166,314	19,762	21,190	H
4	1974	3,641	.	5,125	650	5,106	496	2,315	L
5	1958	38,512	12,406	101,193	38,313	81,250	3,250	11,700	L
6	1960	.	.	.	.	.	.	.	L
7	1958	.	0	18,729	0	21,380	0	2,880	L
8	1850	2,004	114	4,647	435	6,570	826	1,540	M
9	1954	58,419	4,851	111,797	8,106	174,930	12,560	26,090	H
10	.	75,666	16,594	148,394	41,686	169,664	47,652	31,950	H
11	1962	8,100	321	15,500	523	19,300	.	1,936	M
12	1820	2,184	.	7,000	.	6,510	.	3,750	L
13	1960	3,102	95	6,076	170	7,735	42	2,090	L
14	1975	13	0	.	0	.	0	.	L
15	1956	20,200	139	37,449	3,433	46,856	3,590	3,100	L
16	1951	.	.	399,000	.	490,000	.	40,000	H
17	1962	2,549	0	1,265	0	1,622	0	907	L
18	1980	.	0	.	0	35	0	20	L
19	1955	6,783	0	24,052	0	30,600	0	2,700	M
20	1961	4,744	1,189	4,070	0	5,884	0	1,770	L

NOTES:

1) Production and Export data are in LE '000.
2) . = Missing data.
3) H = High, M = Medium, L = Low.

LE 47.6 million.

Table III.2 above also includes a column on "Technology Export Intensity". As an approximate measure of the extent of technology export activity of our sample firms, we constructed a three-point ordinal scale based on a) the information obtained from the companies during the interviews, b) that contained in the questionnaire, and c) other field research and observations. This we called the "technology export intensity", the overall extent and magnitude of the exports of technology, know-how and skilled manpower by a company relative to Egyptian firms and, in particular, the other firms in the sample. While admittedly this index is somewhat subjective, every effort was made to ensure that the index reflect accurately the extent of technology transfer from the firm in question.

4. Analysis of results

We now discuss further the results of our technology export intensity index. Of the 20 cases for which data is presented in Table III.2, only four cases scored "high". Another 4 (20%) were classified as having a medium level of technology exports. Thus the intuitive notion that, all told, Egyptian export of technology and know-how is not at a high pitch, is confirmed by the modesty of these figures.

Modest they may be, but they are far from inconsequential.

Our case studies in Chapter V will provide detailed evidence to substantiate this assertion even further.

First let us examine the types of technology we identified as having been exported from Egypt since 1970. Table III.3. and Chart 1 show the relevant information.

Table III.3

Types of Technology Exported From Egypt

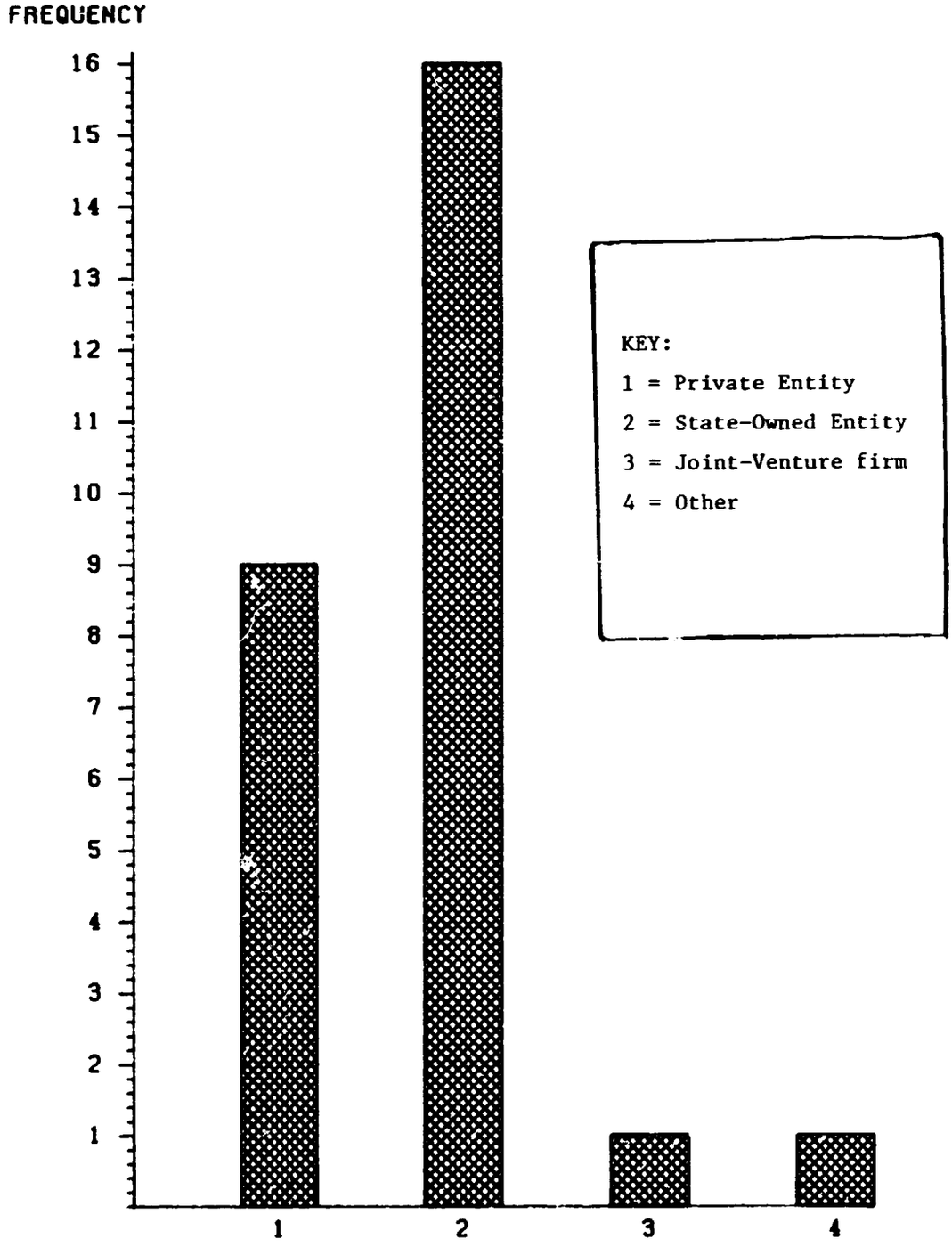
Type	Rank	Frequency	Percentage
Consulting, Engineering, Management Services, Technical Assistance	1	14	41.18
Training	2	11	32.35
Labor Supply	3	3	8.82
Patent Licensing Agreement	4*	1	2.94
Know-How Licensing		1	2.94
Foreign Direct Investment		1	2.94
Turn-key Projects		1	2.94
Other		1	2.94
TOTAL		34	100.00%

* tied.

N = 19

Chart 1

TYPES OF FIRMS RECEIVING TECHNOLOGY AND KNOW-HOW FROM EGYPT



As readily seen from this data, our first hypothesis holds beyond any doubt. The overwhelming majority of the 34 instances of technology transfer from Egypt (over 80%) involve person-embodied technology. Further evidence, to be reviewed in Chapter IV below, will provide additional affirmation of this fact.

Proceeding now with other aspects of our survey, we next look at the destinations of Egyptian technology. This data is shown in Chart 2 and in Table III.4.

Table III.4

Frequency of Technology Exports by Destination

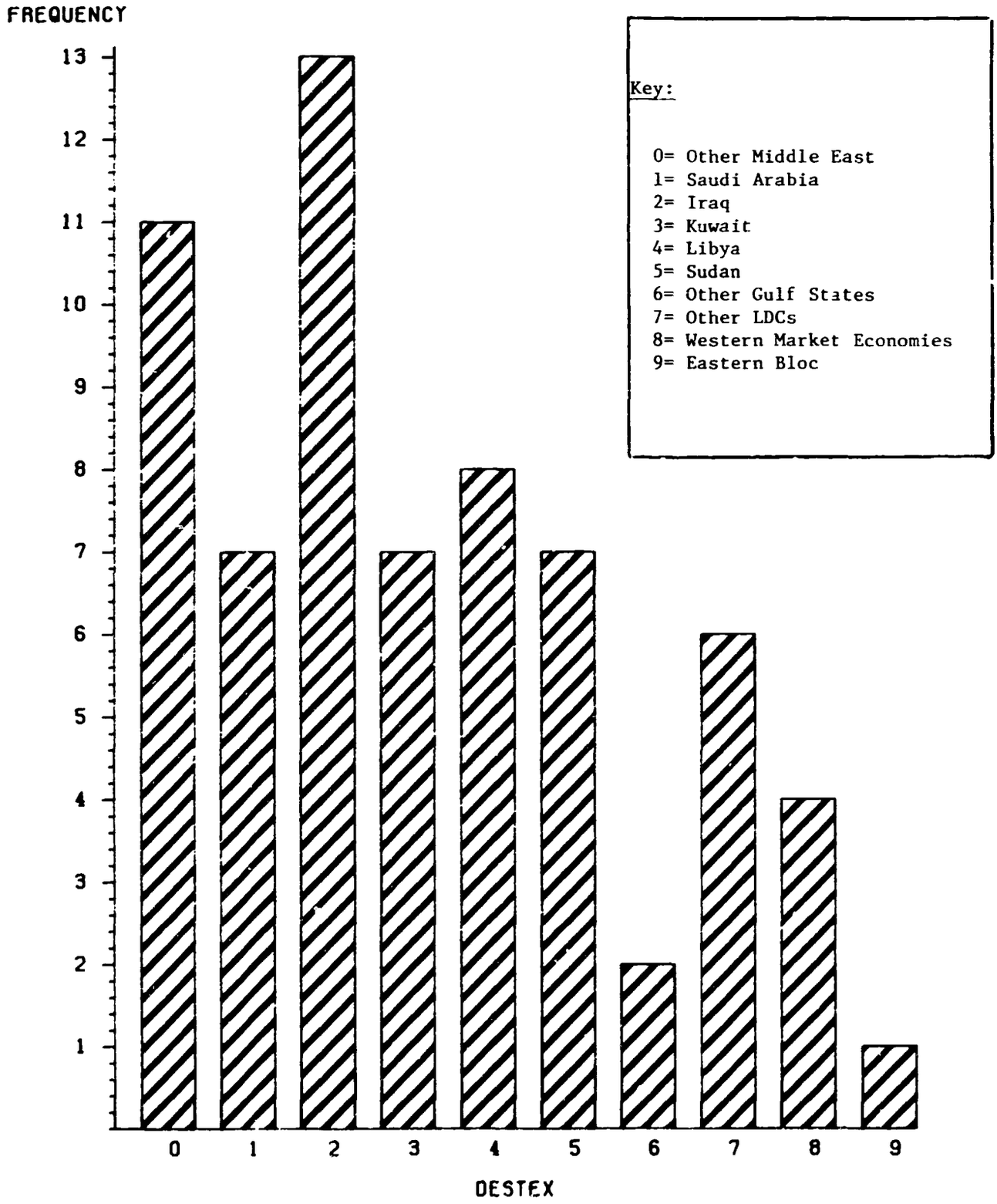
Destination	Rank	Frequency	Percentage
Iraq	1	13	19.70
Other Middle Eastern Countries	2	11	16.67
Libya	3	8	12.12
Kuwait	4*	7	10.61
Saudi Arabia		7	10.61
The Sudan		7	10.61
Other LDCs	5	6	9.09
Western Market Economies	6	4	6.06
Eastern Bloc	7	1	1.52
Total		66	100.00%

*Tied scores.

N = 19

Chart 2

DESTINATIONS OF TECHNOLOGY EXPORTS FROM EGYPT



As shown by this table, Iraq with 13 incidents of technology transfer from Egypt was the most frequent recipient, followed by "other Middle Eastern countries" (11), Saudi Arabia, Kuwait and The Sudan (7 each), and "other LDCs" (6). Note that as many as 53 of the 66 incidents of technology transfer from Egypt surveyed in this study (80%) are to Arab countries (nearly all the 11 cases recorded on "other Middle Eastern countries" involved Arab countries.) This is directly pertinent to our hypothesis, especially 2 and 3.

Besides the destination of the sample firms' technology exports, we have data on the destination of merchandise export for 13 of the firms. This information is presented in Table III.5 below.

Table III.5

As can be seen from a comparison of overall exports with technology exports in the above two tables, there is a considerable overlap between the destination in the two cases. Again, the political-cultural link appears to plan an important role. This is further highlighted by the survey results pertaining to the advantage the Egyptian firms perceived they had over non-Egyptian competitors in international markets. Results are presented in Table III.6 and Chart 3.

Table III.6.

These results add further credance to our second hypothesis. Evidently the existence of political, cultural and (less frequently mentioned) commercial ties provide the most important

Chart 3

EGYPTIAN FIRMS' ADVANTAGES OVER OTHERS

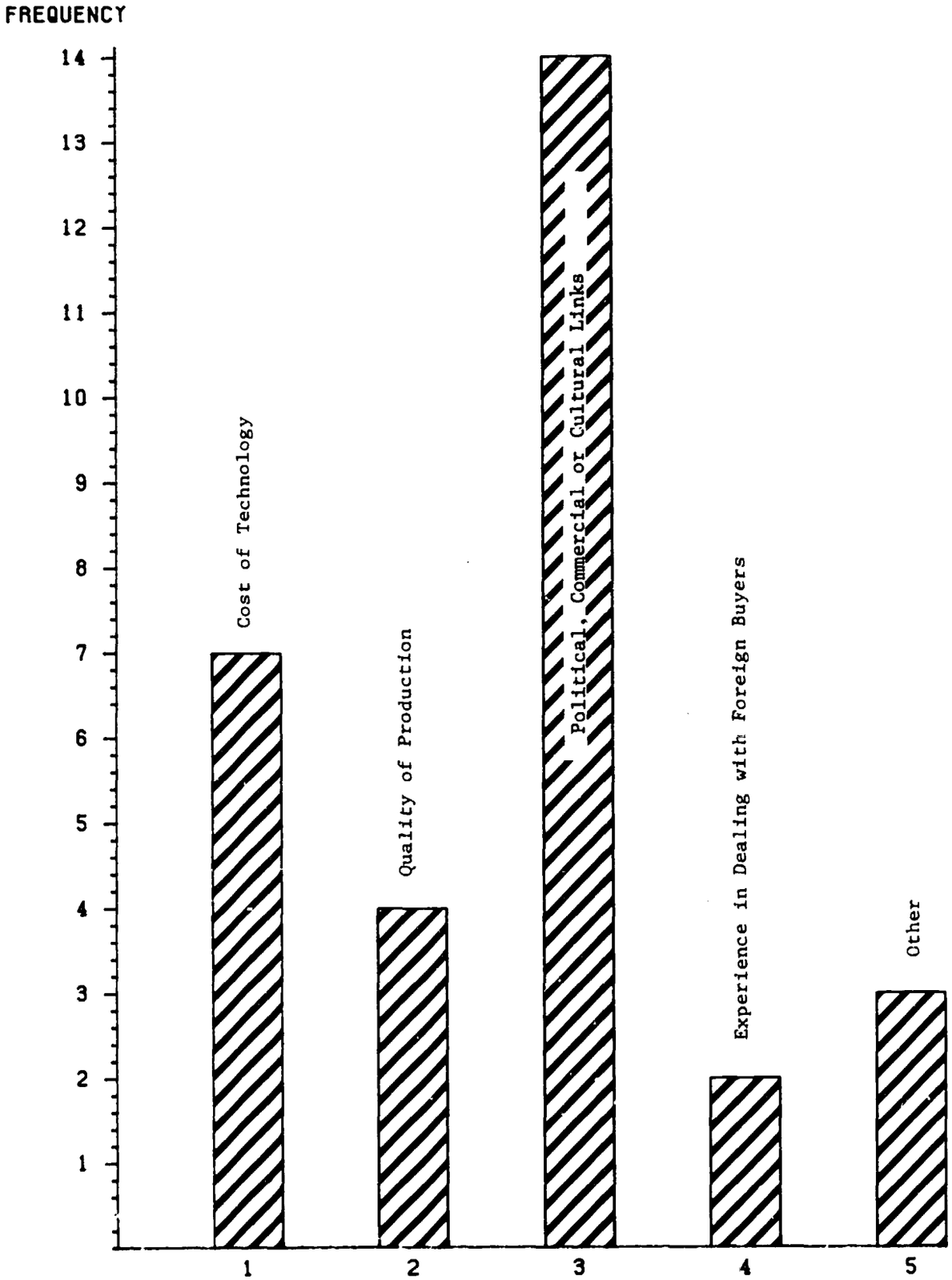


Table III.5

Frequency of Merchandise Export by Destination

Destination	Rank	Frequency	Percentage
Saudi Arabia	1*	6	13.95
The Sudan		6	13.95
Other LDCs		6	13.95
Iraq	2	5	11.63
Other Middle Eastern Countries	3*	4	9.30
Western Market Economies		4	9.30
Kuwait		4	9.30
Libya	4*	3	6.98
Eastern Bloc		3	6.98
Other Gulf States	5	2	4.65
TOTAL		43	100.00%

*Tied scores.

N = 13

Table III.6

Egyptian Firms' Advantages Over Others

Advantage	Rank	Frequency	Percentage
Political, Commercial or Cultural Links	1	14	46.67
Cost of Technology	2	7	23.33
Quality of Production	3	4	13.33
Other	4	3	10.00
Experience in Dealing with Foreign Buyers	5	2	6.67
TOTAL		30	100.00%

N = 16

advantage in almost half of the times for the 16 firms in the sample.

What about the prosperity of a company to export and its relationship to the company's technology export performance?

We postulated earlier, in hypothesis[7], that there is a relationship between a company's overall export performance and its technology export intensity. Here we present data to test this hypothesis. A modified analysis of variance (MANOVA) was performed, with missing data excluded, where the exports of 15 companies in 1975, 1979 and 1980, using GOFI data discussed in

Chapter II, were correlated with their technology export intensity index. As mentioned earlier, this index was constructed through an examination of the relative level of technology exports by each company visited and interviewed. Companies' technology exports were ranked as high, medium or low relative to one another. Table III.7 below reports the results of the analysis of variance.

Table III.7

Analysis of Variance: Overall Exports and Technology Export

Year	R^2	F Value	F Probability
1975	0.598	8.94	0.0042
1979	0.345	3.17	0.0787
1980	0.697	13.80	0.0008

N = 15

These results tend to confirm the hypothesis. The R^2 and F Values are sufficiently high and the F propability low enough to indicate the existence of a relationship between overall export and technology export if the overall exports from either of the three years are taken.

Just how did the technology export opportunity come about? Table III.8 below and Chart 4 show our results.

Chart 4

HOW TECHNOLOGY EXPORT CAME ABOUT

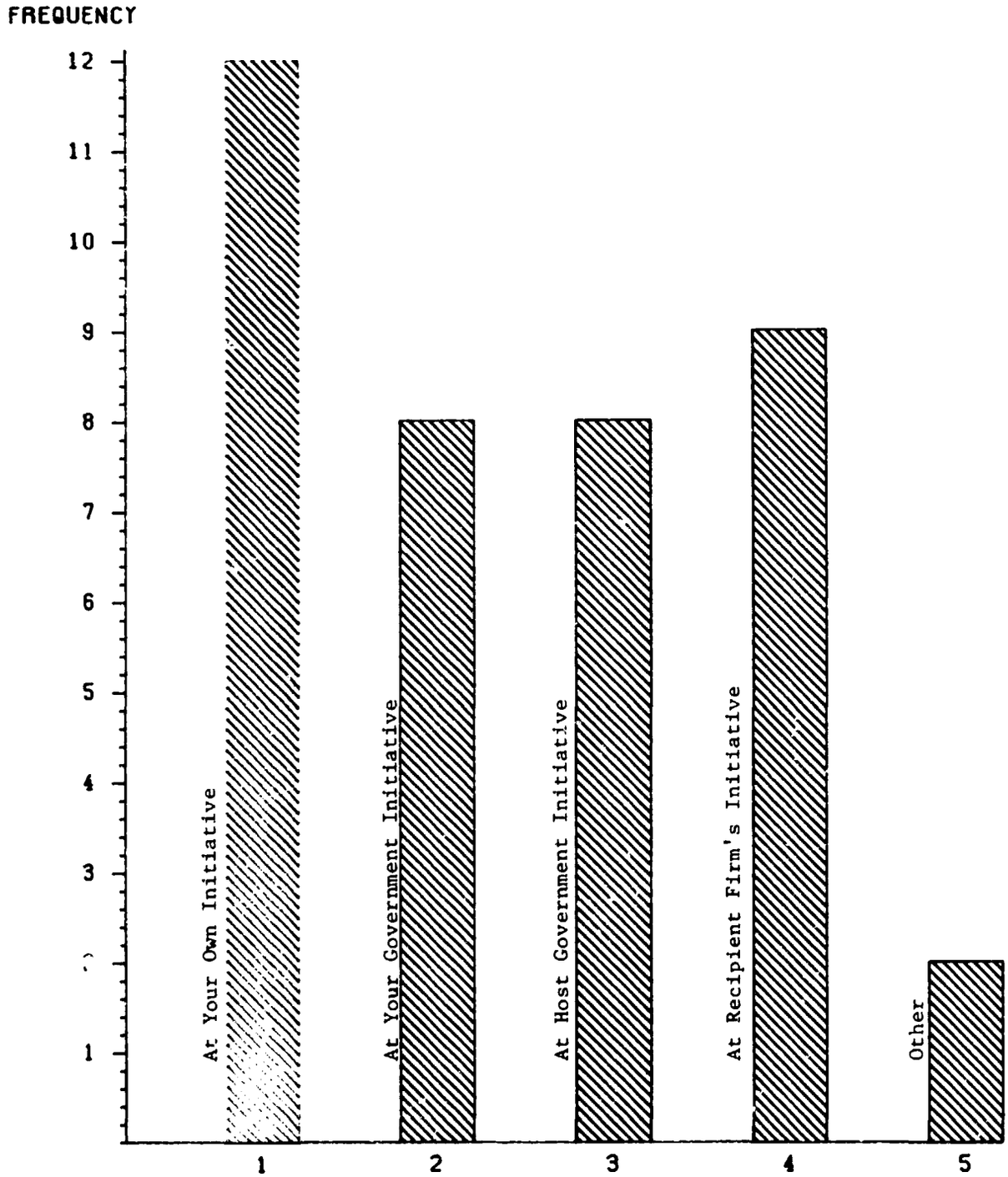


Table III.8

How Technology Export Came About

	Frequency	Percentage
At Your Own Initiative	12	30.77
At Your Government's Initiative	8	20.51
At Host Government's Initiative	8	20.51
At Recipient Firm's Request	9	23.08
Other	2	5.31
TOTAL	39	100.00%

N = 17

We note that about one-third of the instances of technology export came about at the firm's initiative. While a sizeable percentage for Egypt, it is less than instances where the initiative came from governments, host or Egypt (41%). The fact that 23% of the cases were at the recipient firms' initiative is an indication of the Egyptian firms' reputation.

Asked about their motives for transferring technology abroad, the most frequent response was that it was a corporate policy to do so. This response is made ambiguous at times because some firms said that their government requested them to get involved in the project. And it is their corporate policy to follow such

directives, they claimed. So the project is ostensibly a manifestation of corporate policy, whereas in fact it is a response to their government's call for cooperation.

Results, responses by 17 cases in our sample, are shown in Table III.9 below and in Chart 5.

Table III.9

Egyptian Firms' Motives for Exporting Technology

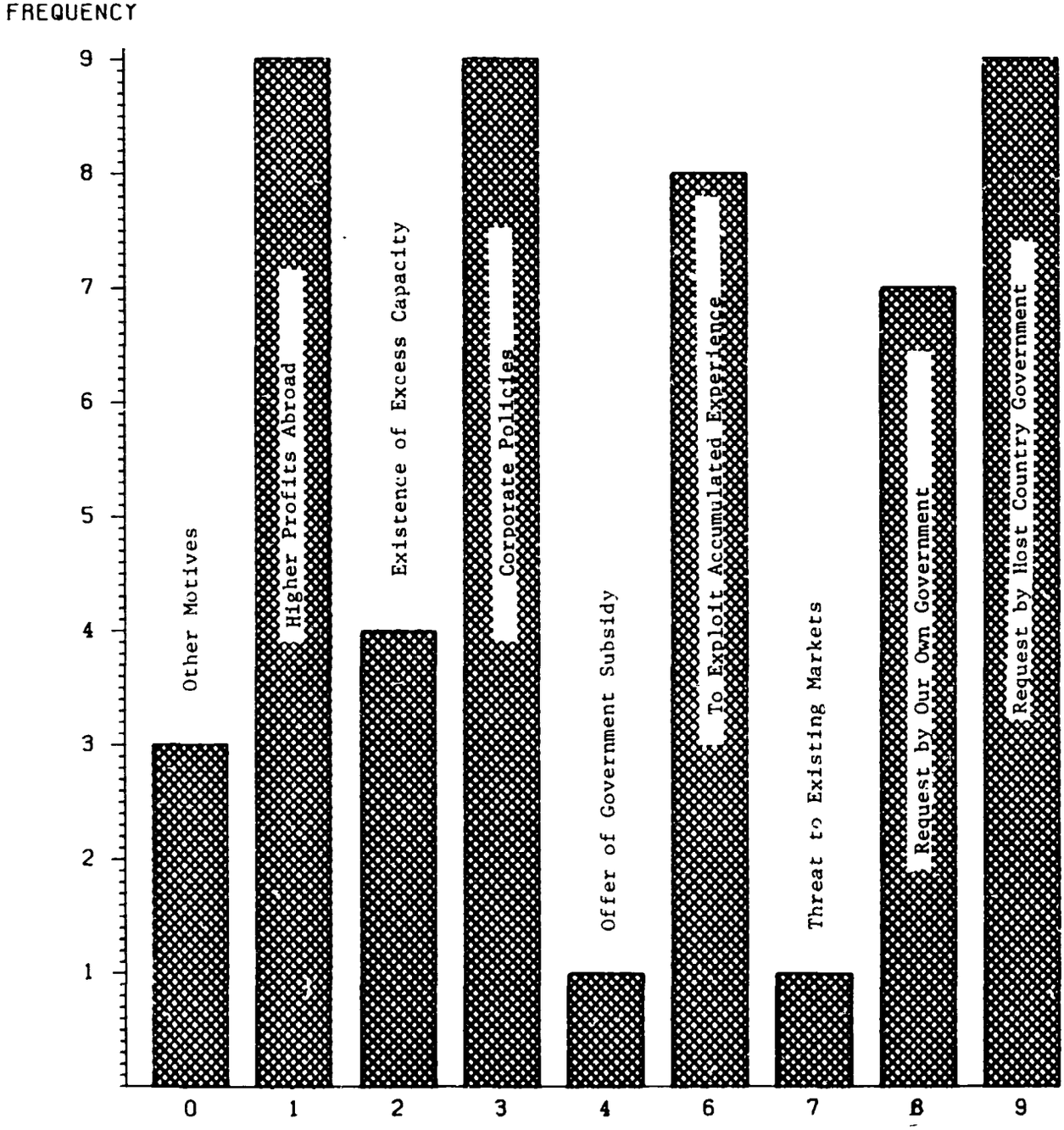
Motive	Rank	Frequency	Percentage
Request by Host Country Government	1*	9	18
Corporate Policies		9	18
Higher Profits Abroad	2*	8	16
Exploit Accumulated Knowledge and Experience		8	16
Request by our Government	3	7	14
Existence of Excessive Capacity	4	4	8
Other Motives	5	3	6
Offer of Government Subsidy	6*	1	2
Threats to Existing Markets		1	2
TOTAL		50	100%

*Tied.

N = 17

Chart 5

EGYPTIAN FIRM'S MOTIVE(S) FOR EXPORTING TECHNOLOGY



Request by host country government, together with "request by our own government," and "offer of government subsidy," account for a motive 34% of the time. But it appears that corporate level considerations besides "corporate policies" are playing a significant role. The dominance of extra-corporate motives, however, lends further support to hypotheses 2 and 3.

The respondents were asked how much additional technological effort was required in order to mount the export project. Results are shown in Table III.10 below and in Chart 6.

Table III .10

Changes Made in Technology Prior to Exporting

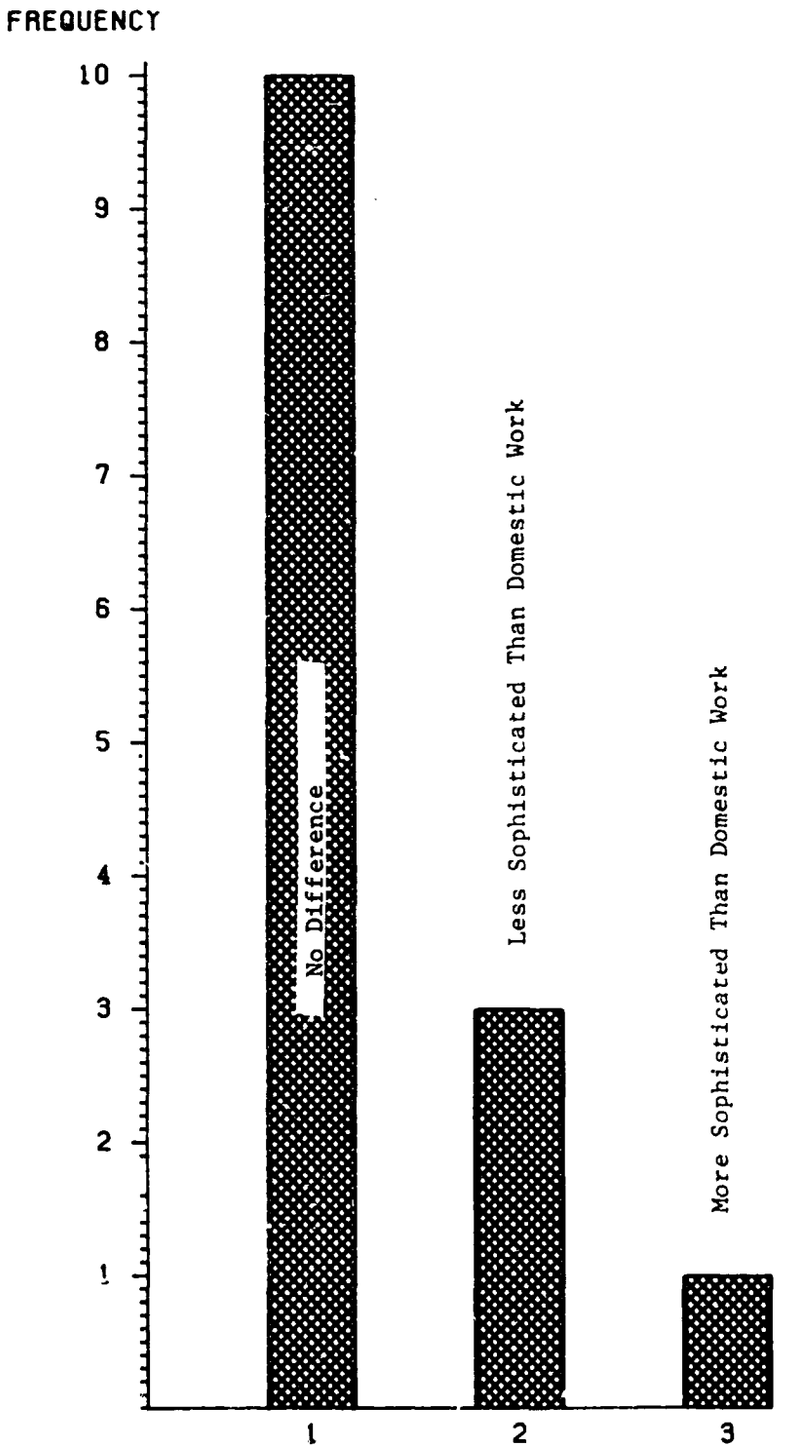
	Frequency	Percentage
None	2	15.38
Minor Adaptions	8	61.54
Significant Changes	3	23.08
TOTAL	13	100.00%

N = 13

These results are pertinent to hypothesis 6, which deals with the relative sophistication of exported work compared with in-house technology. That in 23% of the cases significant changes were required, and in 77% minor or no adaptations were made, testifies to this point. Even more directly pertinent to the issue are the results of our survey concerning the sophistication of export work.

Chart 7

SOPHITICATION OF EXPORTED VS. DOMESTIC WORK



When asked whether the export work was more sophisticated, less sophisticated or the same as in-house technology, over 70% said there was "no difference," while 21% said export work was "less sophisticated," and only 7% said "more sophisticated." This data lends further support to the validity of hypothesis 6, and is prescribed in Table III.11 below and in Chart 7.

TABLE III.11

SOPHISTICATION OF EXPORTED VS. DOMESTIC WORK

	Frequency	Percentage
No Difference	10	71.43
Less Sophisticated than Domestic	3	21.43
More Sophisticated	1	7.14
TOTAL	14	100.00

N = 14

As this data shows, in the overwhelming majority of cases, exported technology was either no different from or less sophisticated than what was utilized in-house. The small percentage of firms who answered otherwise gave as their primary reason the argument that many of their international clients were rich enough to require the best and to impose quality standards that could be asked only if money is no object.

The respondants were asked about the nature of foreign firms with whom they dealt in the technology transfer relationship. Specifically, we asked about the ownership and size attributes of the recipient firms. On ownership, nearly 60% were state-owned enterprises, while one-third of the 27 recipient firms were private sector. Table III.12 and Chart 8 provide the results.

Chart 6

CHANGES MADE IN TECHNOLOGY PRIOR TO EXPORTING

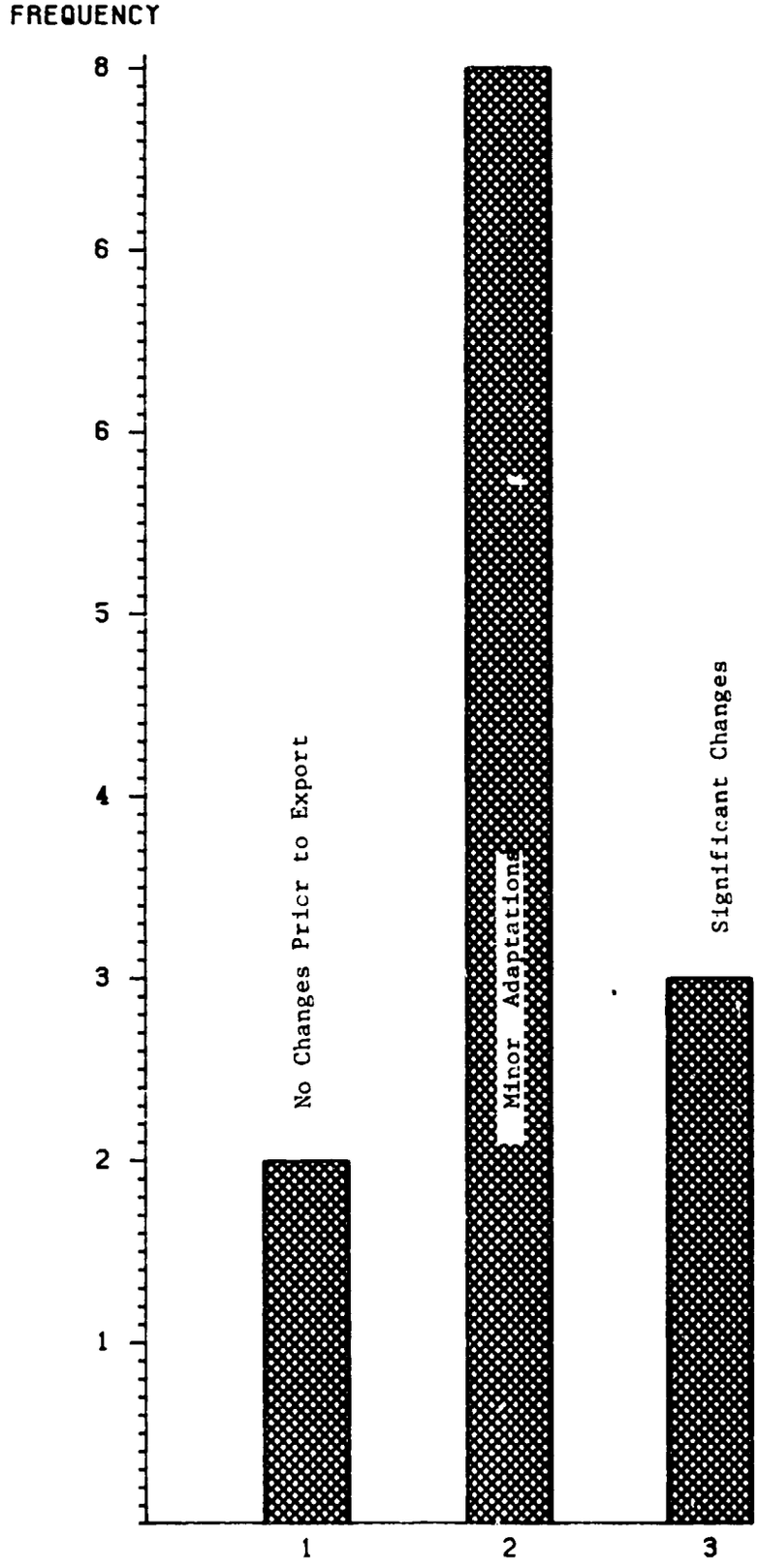


TABLE III.12

OWNERSHIP STATUS OF RECIPIENT FIRMS

		Percentage
Private Entity	9	33.33
State-Owned Entity	16	59.26
Joint Ventures	1	3.70
Other	1	3.70
TOTAL	27	100.00

N = 18

Results of this set of information provide further evidence regarding the dominant role played by both host and home government. These results thus lend additional support to hypotheses 2 and 3.

As for the size of recipient firms, eight respondents answered. Three said that the firms to whom they provided technology were small; four said their recipients were large-sized; and one said it dealt with a medium-sized recipient firm. The fields of activity of these recipients included manufacturing (for six of the nine who answered this question), one public utility company, one consulting and engineering company, and three miscellaneous categories. The dominant share of manufacturing firms among those receiving technology from Egypt is not unexpected, and can be explained by the Egyptian head start in manufacturing about which we spoke in Chapter II.

The respondents were asked if the export of technology was important to their market standing at home and abroad. While the number of responses to this question (4) is too small to generalize

from, we do note that three considered the technology export opportunity to be unimportant for their market standing at home. One considered it very important. On the other hand only one considered it "unimportant" for its market standing abroad; another one considered it "somewhat important," and two thought it was "very important" to their competitive position abroad.

Asked if they received any help in the technology export project, the six answers available are broken down as follows: Four (or two-thirds of those who responded) had received some government support. This had come in the form of government's promotional efforts, financial incentives, provision of personnel, etc. One respondent had received help from a private institution. And another one had received other types of help. Was this help important? How much value did the technology exporting firms place on such help? Again, unfortunately we have too small a response figure. But three of the four responding valued the aid as "important," one as "decisive," on a scale of "decisive," "important," and "unimportant."

Finally, we asked for suggestions on improvements in the promotional system regarding technology exports from Egypt. The following were among the suggestions we received from the 12 who responded:

Suggested Help	Frequency
- More information	6
- Financial aid	5
- Financial incentives	1
- Other	5

Additional details on some of these suggestions are contained in the case studies in Chapter V.

In the following chapter, we turn to a more in-depth examination of the primary mode of technology export from Egypt, namely the emigration of skilled manpower.

CHAPTER IV

TRANFER THROUGH SKILLED MANPOWER

Perhaps the single most important mode of technology transfer from Egypt has been the person-embodied form. No one knows precisely how many skilled Egyptian teachers, machinists, welders, electricians, farm mechanics, physicians and hundreds of other professional categories are performing skill-intensive jobs abroad. Everyone agrees on two points. First, the number is large. Second, the phenomenon has important ramifications for the Egyptian economy.

When asked what types of technology they exported, 19 in our sample firms responded. The high frequency of certain types of responses is testimony to the importance of person-embodied technology transfer.

As Table III.3 and Chart 1 in Chapter III show, one category, namely "Consulting, Engineering, Management Services, or Technical Assistance" had a frequencey of about 42%. Add to that the categories "Labor Supply" (at 8.8%) and "Training" (at 32.35%) and one can see that over 82% of technology transfer from Egypt is person-embodied. Of course the "Training" category is somewhat different and should not be confused with the outward movement of skilled people. But its high frequency points to the underlying capacity of the Egyptian economy, in that it is providing not only training for domestic needs but also for non-

Table IV.1

Labor Exporting Countries: Migrant Workers in the Major Labor Importing Countries (Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and United Arab Emirates), 1975 and 1985
(High Growth Rates)
(Thousands)

Labor Exporting Countries	1975 No. of Migrant Workers	1975 Percent	1985 No. of Migrant Workers	1985 Percent
Egypt	353.3	22.1	711.5	20.1
Iran	69.9	4.4	115.6	3.3
Iraq	18.7	1.2	12.4	0.3
Jordan	139.0	8.7	257.4	7.2
Lebanon	28.9	1.8	70.4	2.0
Morocco	2.2	0.1	12.5	0.4
Oman	30.8	1.9	46.0	1.3
Sudan	26.0	1.6	88.1	2.5
Syria	38.1	2.4	96.1	2.7
Tunisia	29.3	1.8	62.8	1.8
Yemen (YAR)	328.5	20.5	400.8	11.3
Yemen (PDRY)	45.8	2.9	84.7	2.4
India	141.9	8.9	360.7	10.2
Pakistan	205.7	12.8	541.3	15.2
South East Asia	20.5	1.3	370.5	10.4
Rest of World	122.2	7.6	317.6	8.9
TOTAL	1,600.8	100.0	3,548.4	100.0

Source: I. Serageldin, et al, "Manpower and International Labor Migration in the Middle East and North Africa," (Washington, The World Bank, 1981), mimeo, p. 7.

Table IV.2

Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia and United Arab Emirates:
Employment of Egyptians, Pakistanis, Jordanians and All Non-Nationals by Occupation, 1975 and 1985
(Percent)
(Thousands)

Occupational Level	Egyptians				Pakistanis				Jordanians				All Non-Nationals			
	1975		1985		1975		1985		1975		1985		1975		1985	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Professional & Technical Occupations (A-1)	8.9	2.5	30.9	4.3	1.5	0.8	12.8	2.4	11.1	8.0	26.3	10.2	43.3	2.8	158.8	4.5
Other Professional Occupations (A-2)	27.2	7.7	73.2	10.3	5.5	2.7	17.9	3.3	26.8	19.3	52.4	20.3	95.2	6.1	253.4	7.1
Sub-Professional & Technical Occupations (B-1)	8.4	2.4	25.6	3.6	12.6	6.1	38.2	7.1	12.9	9.3	29.0	11.3	54.1	3.4	173.6	4.9
Other Sub-Professional Occupations (B-2)	19.3	5.5	58.7	8.2	4.8	2.3	21.7	4.0	16.5	11.9	41.9	16.3	66.0	4.2	207.7	5.8
Skilled Office & Manual Occupations (C-1)	34.4	9.7	96.1	13.5	68.3	33.2	140.1	25.9	21.9	15.7	38.6	15.0	268.4	17.1	609.2	17.2
Semi-Skilled Office & Manual Occupations (C-2)	63.5	18.0	86.6	12.2	32.6	15.8	87.0	16.1	8.9	6.4	20.9	8.1	306.1	19.5	653.7	18.4
Unskilled Occupations (D)	191.6	54.2	340.4	47.9	80.4	39.1	223.6	41.2	40.9	29.4	48.3	18.8	736.7	46.9	1,491.9	42.1
TOTAL	353.3	100.0	711.5	100.0	205.7	100.0	541.3	100.0	139.0	100.0	257.4	100.0	1,569.8	100.0	3,548.3	100.0

Source: I. Serageldin, et al., "Manpower and International Labor Migration in the Middle East and North Africa," (Washington: The World Bank, 1981), mimeo, p. 118.

Table IV.2a

Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia and United Arab Emirates:
Total Employment of Egyptians by Economic Sector and Occupation in 1985
(High Growth Rates)

Economic Sector	Occupational Level	A-1 Professional & Technical Occupations		A-2 Other Professional Occupations		B-1 Sub-Professional & Technical Occupations		B-2 Other Sub-Professional Occupations		C-1 Skilled Office & Manual Occupations		C-2 Semi-Skilled Office & Manual Occupations		D Unskilled Occupations		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Agriculture	No.	2,219	2.2	2,276	2.2	2,325	2.3	2,969	2.9	1,620	1.6	4,879	4.6	86,872	84.2	103,160	100.0
	Percent	7.2		3.1		9.1		5.1		1.7		5.6		25.6		14.5	
Mining & Quarrying	No.	1,086	10.4	1,364	13.1	620	5.9	549	5.3	1,093	10.5	1,937	18.6	3,791	36.2	10,440	100.0
	Percent	3.5		1.9		2.4		0.9		1.1		2.2		1.1		1.5	
Manufacturing	No.	1,718	4.3	3,742	9.5	1,701	4.3	2,127	5.4	4,272	10.8	7,824	19.8	18,155	45.9	39,539	100.0
	Percent	5.6		5.1		6.6		3.6		4.4		9.0		5.3		5.6	
Utilities	No.	655	6.6	860	8.7	854	8.6	622	6.3	2,532	25.6	2,137	21.6	2,229	22.6	9,889	100.0
	Percent	2.1		1.2		3.3		1.1		2.6		2.5		0.7		1.4	
Construction	No.	4,396	2.9	7,641	5.2	4,429	3.0	7,666	5.2	18,982	12.8	13,474	9.1	91,493	61.8	148,081	100.0
	Percent	14.2		10.4		17.3		13.1		19.8		15.6		26.9		20.8	
Trade & Finance	No.	3,368	4.6	10,085	13.7	2,323	3.2	6,138	8.3	20,321	27.6	14,779	20.0	16,699	22.6	73,713	100.0
	Percent	10.9		13.8		9.2		10.5		21.2		17.2		4.9		10.4	
Transport & Communications	No.	1,787	4.1	3,990	9.1	1,233	2.8	2,508	5.7	10,476	23.9	4,792	11.0	18,903	43.4	43,689	100.0
	Percent	5.8		5.4		4.8		4.2		10.9		5.5		5.6		6.1	
Services	No.	15,692	5.6	43,296	15.3	12,122	4.3	36,102	12.8	36,839	13.0	36,734	13.0	101,566	36.0	282,351	100.0
	Percent	50.7		59.1		47.3		61.5		38.3		42.4		29.9		39.7	
Total	No.	30,921	4.3	73,254	10.3	25,607	3.6	58,681	8.3	96,135	13.5	86,556	12.2	339,708	47.8	710,862	100.0
	Percent	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	

Source: I. Serageldin, et. al., "Manpower and International Labor Migration in the Middle East and North Africa." (Washington: The World Bank, 1981), mimeo, p. 120.

Egyptians as well as Egyptians who leave the country for greener pastures after receiving training in Egypt.

It has been estimated by a World Bank team that there were 1.6 million workers in the Middle East and North Africa working outside their countries and in one of the nine oil-rich countries of Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Iraq, Algeria and the U. A. E. in 1975. The same study projects the figure to swell to as much as 4.3 million by 1985.[1] Egypt has been a major country at the supply end of this flow, as can be seen from Table 1 .

The World Bank study estimated Egyptian labor in Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia and U. A. E. in 1975 at 353,300 (or 22.1% of total), and projected the figure in 1985 to increase to 711,500(but decrease to 20.1%). Table IV.1 shows migration of Egyptians and some other nationalities in 1975 with 1985 projections. A more detailed projection of Egyptian migrant workers by skill category is provided in Table IV.2a.

According to a report published in the Cairo newspaper Mayo, a total of 119,745 skilled Egyptian workers left for other Arab contries in 1980. Of these, 27,801 consisted of government secondments, but over three times as many - 91,944 - were private.

Yet another estimate, also published in the Mayo reports, puts the total number of Egyptians abroad at 1,578,000, those

working abroad at 473,400, total domestic manpower at 11,442,400, and unemployed domestic workers at 535,900. This report projects that, by 1985, Egypt will need 226,000 teachers, 55,000 accountants, 55,148 engineers, 64,681 medical personnel, 21,039 lawyers, and 951 economists and political scientists at home.[2] A breakdown of Egyptian skilled workers who left for work abroad in 1981, based on the Mayo report, is presented in Tables III.3 and III.4.

No doubt the primary motive for temporary migration of Egyptians is financial. An I.L.O. study of wage differentials between Egypt and contries of immigration, for three categories of construction workers, University staff, and teachers found a ratio as high as 11.3 to 1.[3] See Table III.5 for more details.

There are a complex set of non-financial motives involved as well. These have been explored extensively in the literature on brain drain or "reverse transfer of technology",[4] and they include pull as well as push factors. But, as in other forms of technology tranfer, the common language of culture between Egypt and labor-importing Arab countries has had a role.

In Saudi Arabia, in particular, being both Muslim and Arab has put Egyptians in a favored position since the Saudis decided in the mid-1970's that "in order not to tarnish Saudi Arabia's Islamic way of life, emphasis . . . [should be] . . . placed on bringing in workers from the Muslim countries."[5]

In duration, most of the emigration is temporary, with

Table IV.3

Skilled Egyptian Manpower in the Arab World, 1980

Skill Type	Private Contracts	Governments Secondments	Total
Technical and Scientific Work	32,522	27,793	60,315
General Management	1,567	4	1,571
Office and Clerical Work	21,771	-	21,771
Services	3,815	-	3,815
Sales Clerks	1,800	-	1,800
Agriculture and Fisheries Work	3,449	-	3,449
Manufacturing, Maintenance and Transport Work	27,020*	4	27,024
Total	91,944	27,801	119,745

Source: Mayo (in Arabic), March 13, 1981.

*For more detailed breakdown of this category, see Table IV.5.

Table IV.4

Private Skilled Workers in Manufacturing, Maintenance, and Transport Work in Arab Countries

Type of Work	Number	Type of Work	Number
Construction Workers	3,884	Auto Mechanics	701
Supervisory Personnel	1,822	Plumbers (Industrial)	686
Electrical Workers	1,771	Electrical Supervisors	625
Drivers	1,404	Blacksmiths	624
High-Voltage Electrical Workers	1,102	Construction Sculptors	446
Mechanics	954	Construction Painters	446
Machinists	865	Plumbers (General)	439
Textile Workers	842	Textile Supervisors	345
Metal Workers	829	Mechanical Supervisors	334
Construction Supervisors	792	Tailors	314
Welders	729	Industrial Drivers	282
Furniture Makers	727	Metal Work Supervisors	170
Printers	708	Other Professional Categories	4,511
		TOTAL	27,020

Source: Mayo, March 13, 1981.

Table III.5

Incomes of Temporary Emigrants Before and After Emigration, 1977
(monthly cash income in LE at official rates)

Occupation	Country of destination	Before Emigration	After Emigration	Ratio
Construction workers	Saudi Arabia	33.44	378.26	11.31
	Libyan Arab Jamahiriya	35.83	289.55	8.08
	Other Gulf States	33.33	260.42	7.81
	Total	34.00	336.19	9.89
University staff	Saudi Arabia	210.58	1,485.71	7.06
	Libyan Arab Jamahiriya	239.29	992.86	4.15
	Kuwait	160.00	1,056.25	6.60
	Total	200.42	1,235.89	6.17
Teachers	Saudi Arabia	56.25	492.55	8.76
	Libyan Arab Jamahiriya	51.97	481.58	9.27
	Kuwait and the Gulf States	45.39	508.93	11.21
		52.83	494.11	9.35

Source: Hansen and Radwan, 1982, p. 91.

family left behind, and often the old position in the government or company awaiting their return.

The export of Egyptian skilled manpower has occured through a variety of channels. These have included government-sanctioned or managed secondments under bilateral intergovernmental contracts, government-sanctioned migrations by public sector firms and other organizations, recruitment agencies, direct recruitment by foreign government agencies, and the illegal or quasi-legal migration by those who enter foreign labor markets as tourists and then convert their legal status.

Government's direct participation in the export of Egyptian skilled labor takes place under the control of various ministries. For teachers, the responsibility has been given to the Ministry of Education.

Under a series of bilateral agreements with several Arab states, the Ministry of Education selects and sends teachers for overseas assignments. While no exact figures are readily available, the number is believed to be in the thousands.

It is commonly held that this project has been relatively effective and free from internal as well as inter-governmental political influence. Countries with teacher-supply contracts with Egypt include Saudi Arabia, Libya, Iraq and the U. A. E. These arrangements are said to have been minimally affected by the post-Camp David Arab boycott of Egypt.

There is a program similar to this one also at the Ministry of Health, for secondment of health and medical personnel. Other government agencies, too, act as recruiters from among their staff for foreign assignments. The National Research Center, discussed in Chapter V of this report, is a prime example.[6]

Egyptian mass media personnel of all types are also present in abundance throughout the Arab World. According to informal estimates, as many as 40% of the technical and professional staff of Egypt's National Radio and Television are running the electronic media in other Arab countries at any given time.

The situation is similar in printed media where professionals from Al-Ahram, Al-Akhbar, Mayo, October and other Egyptian newspapers and magazines find overseas jobs.

According to Hansen and Radwan's estimates, government and public sector secondments of the sort discussed above was 37,281 in 1980, down from its pre-Camp David peak of 41,028 but up from 15,595 in 1970 and 10,257 in 1968. Table III.6 shows this data.

Private recruitment agencies, similar to Business Services International, Case #12 in Chapter V of this report, are also channels for tranfer of Egyptian know-how abroad. In addition to these recruitment agencies, foreign firms and governments have been sending recruiters to Egypt and placing advertisements

Table III.6

Government and Public Sector Secondments (persons)

Year	Number
1968	10,257
1969	11,457
1970	15,595
1971	17,341
1972	13,478
1973	25,327
1974	25,771
1975	27,242
1976	34,511
1977	41,028
1978	33,579
1979*	35,576
1980*	37,281

Source: Hansen and Radwan, 1982, p. 87, based on Amr Mohi-Eldin, "External Emigration of Egyptian Labor." ILO, mimeo., 1980, p. 67.

*Estimated.

in the press to attract Egyptian skilled workers. Exhibits 1 through 5 are examples of such direct recruitment efforts. The first three show ads for Abu Dhabi Oil Company and Gas Company's needs for various types of engineers. Exhibit 4 advertises Qatar's needs for male and female teachers, and Exhibit 5 shows the United Arab Emirates's medical needs in various categories.

Egypt's abundance of manpower has proven to be an asset not only to the labor-short, capital-rich countries of the area but, in some ways, to Egypt itself. This has been the case in at least three ways.

First, employment opportunities abroad (with far more attractive salaries as we said before) has relieved the state of the onerous obligation of having to find every college graduate a job as has been the tradition (and expectation) in the country since the socialism of the Nasser era.[7]

A second aspect of the outflow of manpower is that both government and public sector firms use foreign assignments as a form of bonus for their employees who have "paid their dues" by working for that firm or ministry for a number of years. Since salary and wage levels are controlled at an unrealistic and uncompetitively low level for nealy all skill categories, to grant an employee leave of absence to work abroad would mean giving him the opportunity to accumulate some savings he has been unable to afford. This would, in turn, allow him to buy that flat or

or automobile he has dreamed about, to get married, or to go into private business. If he happens to be a physician, he can go into private practice.

The third way in which Egypt's labor abroad has proven to be an asset to the home economy has been their repatriation of foreign exchange into Egypt to the tune of over $4 billion per year in 1982. This has proven to be Egypt's single most important source of foreign exchange earnings.

Egypt's foreign exchange revenues through workers' remittances was $ 2,210 million in 1979 and $ 2,700 million in 1980, according to one source. This compares very favorably with tourism ($ 600 million and $ 780 million), Suez Canal revenues ($ 590 million and $ 780 million) and cotton exports ($ 350 million and $ 330 million). It is even higher than the country's largest export category, namely petroleum products, which earned Egypt $ 1,350 million in 1979 and $ 2,500 million in 1980. See balance of payments summary statistics in Table IV.7 below.

The Central Bank of Egypt has put the savings of Egyptians working abroad at LE 1,717 million in 1979/80 and LE 1,746.1 (or $2,496.9 million) in 1980/81 fiscal year. See Table IV.8.

And thus, for a country as much in need of foreign exchange, export of labor seems a blessing. Together with the other two factors - relieving domestic unemployment pressure and acting as

Table IV.7

Egypt's Balance of Payments[1]

(In millions of U.S. dollars)

	1979	1980
Exports	2,510	3,850
Petroleum & Petroleum Products[2]	(1,350)	(2,500)
Cotton	(350)	(330)
Imports	6,670	7,570
(from the United States)	(1,430)	(1,900)
Trade Balance	-4,160	-3,720
Services Receipts	4,080	5,260
Tourism	(600)	(780)
Suez Canal	(590)	(660)
Workers Remittances	(2,210)	(2,700)
Investment Income	(310)	(440)
Services Payments and Transfers	1,620	2,320
Investment Income	(430)	(600)
Current Account Balance	-1,720	-680

1. For converting items from L.E. into $, the unified rate of exchange (L.E. 1 = $1.43) is used for all transactions.

2. Exclusive of transactions of foreign oil companies. Sales of bunker fuels and other services are included under services receipts.

Source: U.S. Department of Commerce, FET: Egypt, (September 1981), p. 2.

> In 1978, the entire top team of architects and engineers from the General Organization for Physical Planning within the Ministry of Housing and Reconstruction was employed in Saudi Arabia.[9]

That same team observed, furthermore, that emigrant workers tend to be highly skilled and not readily replaceable:

> To the labor-supplying economies, . . . the benefits are mixed. First, because of the selectivity of the process, the already employed, more highly skilled and experienced workers are those who tend to migrate, leaving behind the unemployed. Second, because of a built-in inflexibility in the labor market (those left behind tend not to have the skills needed to fill the vacated positions) reshuffling of labor is limited. Third, the emigration of key employees may disrupt local production, reduce productivity and even contribute to additional unemployment. Further, because the education and training system is also inflexible and since it takes a number of years before newly trained manpower reaches the market place, the possibility of filling gaps in the labor force (the result of large-scale outmigration) is slim.[10]

And so, the outflow of skilled workers is a dilemma for policy makers, a mixed blessing for the society, and a serious problem for firms which lose their most skilled and valuable workers "as soon as we finish training them", to echo an oft-repeated statement by Egyptian executives in interviews we had with them.

Several of our case studies provided vivid examples of the dilemma. Some of our corporate respondents had a more tolerant view of the exodus of skilled workers than others. Signs of frustration and despair were evident in several top executives interviewed. Others, however, tended to be "resigned" to the

idea and took solice at the fact that these workers would return "sooner or later." And when they did, their old jobs at the factory was almost assuredly theirs to have.

The Egyptian society is feeling the pressure of labor emigration in several sectors, most acutely in the construction industry and in agriculture. Even such city services as garbage collection is not immune, as a title in an Egyptian newspaper would attest.[11] Consequently, calls for new restrictions on labor movements have been heard from members of the People's Assembly and industry representatives.[12] At the same time, the government has encouraged the employment of foreign skilled workers for the contribution they can make by training Egyptians and by transferring advanced Western technology. In 1980, there were 3,201 foreigners in Egypt earning a total salary of LE 36 million, according to the Investment Authority data.[13]

Another way in which Egypt has tried to regain, albeit partially or temporarily, some of its permanent emigrants is through a UNDP-sponsored project called Transfer of Know-How Through Expatriate Nationals (TOTKEN). According to TOKTEN/ Egypt's 1981 annual report, some 40 missions had been carried out by 36 expatriate Egyptians who had been hired aways from their regular jobs for specific assignments of limited duration in some 24 Egyptian organizations.[14] This attempt, however admirable, can not reverse the brain drain. Hansen and Radwan

have estimated that between 1962 and 1979, some 31,649 persons left Egypt with a permanent emigrant's visa. To this they add some 24,400 permanent emigrants living abroad and some 600 members of educational missions abroad refusing to return. [:83]

To conclude, Egypt has been a major contributor of skilled manpower to the labor-short Middle East labor market. It continues to be a major source of both skilled and unskilled manpower. And the economy, on the whole, and the individuals involved, have benefitted from this flow. At the same time, the flow has caused strains on the various sectors of the economy which require delicate and careful analysis of major problems are to be avoided in the future. At the forefront of all the needs is an accurate picture of the situation. Detailed and accurate data is, therefore, urgently needed.

Exhibit 1:
Abu Dhabi Company Advertisement in Egypt
For Petroleum Engineers

شركة ابوظبي للعمليات البترولية البرية
(اذكو)
Abu Dhabi Company for Onshore Oil Operations
(ADCO)

تدعو الشركة اصحاب الكفاءة والخبرة المناسبة
لتقديم طلباتهم لملء الوظيفة الشاغرة التالية :
رقم الاشارة : اس ٨٢/١٢٩ S. 129/82 العدد المطلوب : (٨) ثمانية
مسمى الوظيفة : مهندس بترول متدرب (حفر)
Junior Petroleum Engineer (Drilling)
مكان العمل : ابو ظبي العمر المفضل : ٢٢ـ ٢٨ سنة
المؤهلات والخبرة : مؤهل جامعي في هندسة البترول او المعادن او اي اختصاص علمي ذات صلة . اجادة اللغة الانجليزية شرط اساسي . يقوم شاغل هذه الوظيفة بمساعدة مهندس البترول (الحفر) في اعداد البرامج التفصيلية المتعلقة بالحفر والانارة والانجاز للآبار . كما يعمل على مراقبة الجوانب الهندسية لاعمال الحفر التي يقوم بها المقاولون في مواقع اجهزة الحفر ، واخماد الآبار واعادتها ، وتسجيل تقدم الحفر ونتائجه والانارة والانجاز للآبار واعمال كابل الحفر المرتبط بعملية الحفر .
الراتب والمزايا : لا يقل عن ٦٠٠ درهم في الشهر . وتؤخذ الخبرة العملية بعين الاعتبار عند تحديده . يوفر السكن وفق شروط معينة . يمنح الموظفون من مواطني دولة الامارات العربية المتحدة علاوة سكن اعزب او متزوج او توفير السكن ، كما يمنحون علاوة اجتماعية حسب النظام المعمول بها لدى الشركة .
طلبات العمل : تقدم الطلبات على نماذج خاصة بخط اليد باللغتين العربية والانكليزية متضمنة الاسم الكامل والعنوان والجنسية وتاريخ الميلاد ورقم الهاتف والمؤهلات والخبرة العملية وصور عن جواز السفر مرفقة مع صور الشهادات الثبوتية وصورتين شخصيتين وتوجه الى العناوين التالية على ان تصل قبل موعد اقصاه ١٩٨٢/٤/٣٠ وستهمل الطلبات التي لا تتوافر فيها الشروط اللازمة :
١ ـ رئيس دائرة التوظيف ـ شركة ابو ظبي للعمليات البترولية البرية ص.ب ٢٧٠ ـ ابوظبي دولة الامارات العربية المتحدة .
٢ ـ دائرة البترول ـ ص.ب ٩ ـ ابو ظبي ـ دولة الامارات العربية المتحدة .
ملاحظة : تعطى الاولوية في التوظيف لمواطني دولة الامارات العربية المتحدة ، ومن ثم لمواطني الدول العربية الاخرى ، وسوف تهمل الطلبات التي لم تتوافر فيها الشروط اعلاه .

Source: Al-Akhbar, Cairo daily in Arabic, April 4, 1982.

Exhibit 2:
Abu Dhabi Oil Company's Advertisement in a
Cairo Newspaper for Skilled Workers

شركة ابوظبي للعمليات البترولية البرية
(أدكو)
Abu Dhabi Company for Onshore Oil Operations
(ADCO)

تدعو الشركة اصحاب الكفاءة والخبرة المناسبة
لتقديم طلباتهم لملء الوظيفة الشاغرة التالية :
رقم الاشارة : اس ٨٢/١٣١ S. 131/82 العدد المطلوب : (١) واحد
مسمى الوظيفة : مساعد مشرف معدات الحفر
Assistant Field Equipment Supervisor
مكان العمل : مواقع الحقول (المناطق الصحراوية)
العمر المفضل : ٣٠ - ٤٥ سنة

المؤهلات والخبرة : انهاء الدراسة الثانوية العامة (١٢ سنة دراسية) بالاضافة لفترة تدريب مهني مدتها سنتان في الحرف الميكانيكية مع الالمام في الآلات المتعلقة بذلك . اجادة اللغة الانجليزية كتابة ومحادثة شرط اساسي . خبرة ٦ سنوات في مجالات معدات الحفر المتنوعة وصيانة معدات الآبار عمل منها سنة واحدة في وظيفة مشرف وان يكون لديه الالمام في اصلاح معدات الحفر وصيانتها ومعرفة عامة في عمليات الحفر المطلوبة .

يقوم شاغل هذه الوظيفة بالاشراف على كافة عمليات الحفر الموجودة في معمل الشركة الواقع في منطقة باب ١٣ والتي تتضمن صيانة المعدات والقيام بمراقبة وتفتيش المواد الخام المختزنة.

الراتب والمزايا : يتراوح بين ٦٢٤٠ - ٧٨٨٥ درهما في الشهر . وتؤخذ الخبرة العلمية والعملية بعين الاعتبار عند تحديده . يوفر السكن وفق شروط معينة . يمنح الموظفون من مواطني دولة الامارات العربية المتحدة علاوة سكن اعزب او متزوج أو توفير السكن ، كما يمنحون علاوة اجتماعية حسب القوانين المعمول بها لدى الدولة .

طلبات العمل : تقدم الطلبات من نسختين بخط اليد باللغتين العربية والانكليزية متضمنه الاسم الكامل والعنوان والجنسية وتاريخ الميلاد ورقم الهاتف والمؤهلات والخبرة العملية وصور من جواز السفر مرفقة مع صور الشهادات الثبوتية وصورتين شخصيتين وتوجه الى العنوانين التاليين على ان تصل في موعد اقصاه ١٩٨٢/٤/٣٠ وستهمل الطلبات التي لا تتوافر فيها الشروط اللازمة :

١ - رئيس دائرة التوظيف - شركة ابو ظبي للعمليات البترولية البرية ص.ب ٢٧٠ - ابو ظبي - دولة الامارات العربية المتحدة .

٢ - دائرة البترول - ص.ب ٩ - ابو ظبي - دولة الامارات العربية المتحدة .

ملاحظة : تعطى الاولوية في التوظيف لمواطني دولة الامارات العربية المتحدة ، ومن ثم لمواطني الدول العربية الاخرى ، وسوف تهمل الطلبات التي لم تتوافر فيها الشروط اعلاه .

Source: Al-Akhbar, Cairo daily in Arabic, April 6, 1982.

Exhibit 3:
Abu Dhabi Gas Company's Advertisement in a
Cairo Newspaper for Engineers

شركة أبوظبي لتسييل الغاز المحدودة

ادجاز

تعلن الشركة ان لديهـا الوظيفه الشاغرة التالية :

الوظيفة : مهندس عقـود وتصليحات (١)

Post : Contracts & Overhaul Engineer (1)

Ref. : ENG/S/82/79 الاشارة :هندسه/هو/٧٩/٨٢

يعمل شاغل هـذه الوظيفة في جزيرة داس التابعة لامارة ابو ظبي ومن مهـام عمله تنظيم عطاءات المناقصات التنافسية للمشاريع الرئيسية مع التركيز على أعمال التصليح الرئيسية في المصنع التي يقوم بها المقاولون كما يقوم بأعمال التصليح بصفة مهندس مشـارك مقيم وذلك للتأكد من تنفيذ الخطة وجميع التسـهيلات المرتبطة بأعمال التصليح والاعمال التي تسـبق التصليح . يقـوم بتوجيه أعمال شراء المواد وانشاء كافة التعديلات في المصنع بما في ذلك تعديلات التصليحات الشاملة . يتأكد من تطبيق المقاييس والممارسـات الهندسية الصحيحة مع مراعاة الاولويات المطلوبة . يتحكم في المبالغ المصروفة على جميع التعديلات في المصنع ويطبق نظم المراقبة لتوضيح أسباب اية فروقات بينها وبين المبالغ المقدرة وذلك ليصبح بالامكان صرف اية مبالغ اضافية حسب الحاجة . يقوم بمهام وتقديرات خاصة لتحديد متطلبات المشروع ويرفع التوصيات المناسبة بهذا الخصوص . كما يقوم بمهام أخرى مماثلة كتقييم بعض المتطلبات المعينة الخاصة بالميزانية .

على المتقدم لهذه الوظيفة ان يكون حاصلا على بكالوريوس علوم في الهندسـة الميكانيكية مع تدريب عملي على هـذه المهنة لمدة سنتين . خبرة ٨ سنوات في وظائف مختلفة ضمن حقل الهندسة الميكانيكية وذلك في صناعة النفط او الغـاز او البتروكيماويات مع اتقـان اللغة الانجليزية كتابة ومحادثة .

يقتصر التقديم لهذه الوظيفة على الذكور ممن تتراوح اعمارهم بين ٢٩ و ٤٥ عاما . يتمتع الراتب على السن والمؤهلات والخبرة ويتراوح بين ٦٧٤ر١٠ درهما و ١٢٠٠٤ درهما شهريا . يقدم لشاغل الوظيفة السكن والطعام والعناية الطبية والخدمات الترفيهية بدون مقـابل كما يمنح اجازة مدفوعة الاجـر مدتها ٢١ يوما مع تذكرة سفر الى بلد التعاقد بعـد كل ٤٥ يوم عمل .

تقدم الطلبات من نسختين بخط اليد باللغة الانجليزية خلال ١٠ ايام من تاريخ الاعلان وتذكر فيها التفاصيل كاملة واشـارة الوظيفة المبينة اعلاه ورقم الهاتف ـ ان وجد ـ وترسـل الى كل من العنوانين الآتيين :

١ ـ السيد/ كبير آمري التوظيف ـ شركة ابو ظبي لتسييل الغاز المحدودة « ادجاز » ـ ص.ب ـ ٣٥٠٠ ـ أبو ظبي ـ الامارات العربية المتحدة .

٢ ـ السيد/ سـكرتير اللجنة الاستشارية للتوظيف ـ دائرة البتـرول ـ ص.ب ـ ٩ ـ ابو ظبي ـ الامارات العربية المتحدة .

يجب ان ترفق بكل من النسختين صور من الشـهادات اللازمة المتعلقة بالمؤهلات والخبرة صورتين شخصيتين وصورة من جواز السـفر وسوف يهمل كل طلب غير مسـتوف للشروط الآنفة الذكر او لا ترسل عنه نسخة الى كل من العنوانين المذكورين . تعطى الاولوية في التوظيف لمواطني الامارات العربية المتحدة ومن ثم لمواطني سائر الاقطار العربية الاخرى ..

Source:

Al-Akhbar, Cairo daily in Arabic, April 6, 1982.

Exhibit 4:

Qater Government's Advertisement in ε Cairo Newspaper for Teachers

بسم الله الرحمن الرحيم

دولة قطر
وزارة التربية والتعليم

تعلن وزارة التربية والتعليم بدولة قطر عن حاجتها إلى

مدرسين ومدرسات للعام الدراسي القادم: ١٤٠٢/١٤٠٣هـ - (١٩٨٢/٨٣م)

وذلك طبقاً للشروط الآتية

١- مدرس مواد دينية: خريج معهد القراءات أو مؤهل أعلى في مجال تحفيظ القرآن. خبرة لا تقل عن ٨ سنوات بالمدارس أو المعاهد الحكومية.

٢- مدرسة مواد دينية: ليسانس دراسات إسلامية أو ليسانس دار العلوم. خبرة لا تقل عن ٨ سنوات بالمدارس أو المعاهد الحكومية.

شروط عامة

١- قبول العمل في أي منطقة من مناطق دولة قطر. ٢- ألا يزيد العمر عن أربعين عاماً.
٣- الراتب يحدد وفقاً لسلم الدرجات والرواتب المعمول بها على ضوء المؤهل والخبرة.
٤- العقد لمدة ثلاث سنوات تبدأ من تاريخ استلام العمل، قابلة للتجديد، ويخضع لفترة تجربة مدتها سنة واحدة. ٥- إجتياز اللياقة الطبية قبل مباشرة العمل. ٦- إثبات حسن السيرة والسلوك.
٧- العلاج مجاناً للموظف وأفراد عائلته المقيمين معه في قطر.
٨- المكافأة بمعدل شهر واحد عن كل سنة خدمة كاملة وفقاً للأنظمة.
٩- الأفضلية للمتزوج والمتزوجة المتعاقد معهما.

تقدم الطلبات باسم وكيل وزارة التربية والتعليم بدولة قطر - مكتب الملحق الثقافي لدولة قطر (٧ شارع الأشجار - مدينة المهندسين / الدقي / القاهرة) خلال خمسة عشر يوماً من تاريخ الإعلان ويذكر فيها (الاسم بالكامل - الجنسية - تاريخ الميلاد - الديانة - المؤهلات العلمية - مدة الخبرة - رقم الهاتف. ويجب أن يرفق بالطلب صورة فوتوغرافية حديثة وكذا صورة من المؤهلات والخبرات وهي غير قابلة للإعادة).

سيتم نشر الأسماء المطلوبة مقابلتهم في نفس الجريدة في وقت لاحق.

Source:

Al-Akhbar, Cairo daily in Arabic, April 6, 1982

دولة الإمارات العربية المتحدة

إعلان

تعلن القيادة العامة للقوات المسلحة / مديرية الخدمات الطبية عن حاجتها إلى الأطباء حسب الاختصاصات والشروط التالية :

الاختصاصات	المؤهلات "أ"	"ب"	"ج"
١ - جراحة عامة بما في ذلك مسالك بولية	F. R. C. S. أو ما يعادلها	DIPLOMA (MASTER) دبلوم / ماجستير	G.D.M.O (MBBS) =
٢ - طب عام مع صدرية	M. R. C. P. أو ما يعادلها	دبلوم / ماجستير	=
٣ - عظام	F. R. C. S. أو ما يعادلها	دبلوم / ماجستير	=
٤ - أذن وأنف وحنجرة	F. R. C. S. أو ما يعادلها	دبلوم / ماجستير	=
٥ - عيون	F. R. C. S. أو ما يعادلها	دبلوم / ماجستير	=
٦ - أطفال	M. R. C. P. أو ما يعادلها	دبلوم / ماجستير	=
٧ - نسائية وولادة	M. R. C. C. G.	=	=
٨ - تخدير	F. F. A.	=	=
٩ - أشعة	F. R. C. R.	=	=
١٠ - حوادث وطوارئ	M. R. C. P. PATH, HIST, HAEMOTOLOGY	DIPLOMA/MASTER	
١١ - علاج طبيعي	MICROBIOLOGY	دبلوم / ماجستير في علم الأمراض، أمراض الدم والأوعية والجهاز	
١٢ - مختبرات	D. P. H. OR D. I. H.		

١٣ - صحة عامة

الفئة	الخبرة	العمر
"أ"	ليس أقل من ٥ سنوات	دون ٥٠ سنة
—	ليس أقل من ٣ سنوات	دون ٤٠ سنة
	ليس أقل من ٣ سنوات	دون ٣٥ سنة

الرتبة : الفئة "أ" من نقيب إلى مقدم ، تبعاً للخبرة بعد التخرج الأمير. الفئة "ب" نقيب. الفئة "ج" ملازم أول

على كافة الفئات ارتداء اللباس العسكري

فترة التجربة : سيخضع من يقع عليهم الاختيار من كافة الفئات لفترة تجريبية مدتها ثلاثة أشهر ولن يمنح الطبيب أي سكن عائلي خلال هذه الفترة ، بل يتم إسكانه في مساكن العزاب .

ملاحظة :

١ - لن ينظر في طلبات الأطباء الذين يعملون لدى وزارة الصحة في دولة الإمارات العربية المتحدة ، يرجى من المتقدمين كتابة عناوينهم الكامل مع رقم الهاتف إن وجد .

٢ - يرجى من الأطباء الذين أجروا مقابلات لدى مديرية الخدمات الطبية ولم يتم قبولهم ان لا يتقدموا بطلبات جديدة .

الراتب :

الرتبة	الراتب الأساسي
مقدم	٨٠٠٠ درهم
رائد	٧٠٠٠ درهم
نقيب	٦٠٠٠ درهم
ملازم أول	٥٠٠٠ درهم

العلاوات الفنية :

استشاري	٣٥٠٠ درهم
اخصائي	١٢٠٠ - ١٦٠٠ درهم
ممارس عام	١١٠٠ درهم

هذا بالاضافة إلى العلاوات الأخرى التي تقررها الأنظمة والقوانين من حين لآخر .

على الأطباء الراغبين بالتجنيد في القوات المسلحة لدولة الإمارات العربية المتحدة ارسال او تقديم طلباتهم معززة بصورة من الشهادات العلمية والعملية وصورة من جواز السفر وصورة شمسية لمديرية الخدمات الطبية - دولة الإمارات العربية المتحدة أبو ظبي، ص.ب ٣٧٤٠ على أن تصل هذه الطلبات قبل يوم ١٩٨٢/٦/١٥ .

Footnotes

1. Ismail Serageldin, et. al., "Manpower and International Labor Migration in the Middle East and North Africa" (Washington, D.C., The World Bank, 1981), mimeo. See also J. S. Birks and C. A. Sinclair, Arab Manpower (New York: St, Martin's Press, 1980) and Birks and Sinclair, International Migration and Development in the Arab Region (Geneva: ILO, 1980).

2. See special reports on manpower policy and emigration of Egyptians in Mayo, Arabic newspaper, Cairo, March 13, 1981 and November 16, 1981. This report indicated, moreover that the country had a 91% deficiency in lawyers and a 51% shortfall in economists and political scientists in 1981.

3. Hansen and Radwan (18), p. 91.

4. See, for instance, UNCTAD, 1974 (39).

5. Qazi al Ghosaibi, a Saudi Minister, quoted in "Saudi Arabia. A Special Report", Times (London), October 39, 1978.

6. See case no. 23 in Chapter V. below.

7. This guarantee is, in fact, built into the Constitution.

8. Personal interview, May 1982, Cairo.

9. Ismael Serageldin, et. al., "Labor Flows in Mideast are Mixed Blessing," World Bank Report (September - October, 1981), P. 2. See also (

10. Serageldin, et. al., P. 2. See also (36:229).

11. "Garbage Removal Hampered by Manpower Shortage", The Egyptian Gazette (January 6, 1982).

12. "New Laws to Curb Manpower Exodus Planned", The Egyptian Gazette. (January 5, 1982).

13. "Foreign Labor Contribution Vital," The Egyptian Gazette, January 4, 1982.

14. UNDP, "TORTEN/EGYPT Annual Report for 1981," (Cairo: UNDP, January 1982), mimeo.

CHAPTER V

CASE STUDIES

1. Shawki and Co.
2. Engineering and Industrial Design Development Center
3. Societe des Sucreries et de Distillerie d'Egypt
4. Erection and Industrial Services Co. (ERISCOM)
5. El Nasr Automotive Mfrg. Co.
6. Helwan Machine Tools Co.
7. General Company for Paper Industry (RAKTA)
8. El Nasr Salines Co.
9. Egyptian Iron and Steel Co.
10. Misr Spinning and Weaving/Mehalla Kobra
11. Kahira Pharmaceuticals Company
12. Business Services International
13. General Organization for Government Printing Office
14. The Egyptian Mechanical Precision Industries Co. (SABI)
15. The Egyptian International Center for Agriculture
16. Delta Consulting Co.
17. Electrocable Egypt
18. The Arab Contractors Osman Ahmad Osman Co.
19. Nasr Boiler Company
20. Center for Planning and Architectural Studies
21. SEMAF
22. El Nasr Forging Company
23. National Research Center

Case #1

SHAWKI AND COMPANY

Shawki and Company is a private firm established in 1940. Their services include accounting, auditing taxation, financial studies, feasiability studies, management consulting and computer applications (a new addition, including both hardware and software).

Shawki and Company exports to Kuwait and other Third World countries in the form of consulting, engineering, management services, and technical assistance.

Their organizational development strategy includes securing management consulting jobs in the Middle East (all the Arab World) through Arthur Anderson, the large U.S.-based accounting firm with whom Shawki and Company has recently formed a joint venture affiliation. They also plar to expand to 300-400 employees in the next ten years from the current 130, and to have offices elsewhere in the Middle East to work through the firm.

The original source of technology within the organization is Egyptian, having its origins in the Egyptian accounting and financial practices. However, since 1980, some personnel has been trained by Arthur Anderson. They have also sent some of their personnel to the United Kingdom and Switzerland for training.

The imported technology required radical changes. Although Egypt follows French laws, the taxation laws are different. It was necessary to take that which applied to Egyptian society and modify

it. Auditing required the least modification, management consulting required a bit more, and the taxation practices required radical modification.

R & D activities within the company include in-house training courses given by those both inside and outside the company on various aspects of auditing, taxation, and the other services necessary to and provided by the company; employees are sent to universities in Egypt, Geneva, and London for training; and courses and seminars to prepare persons for passing the examination required for admission to the Egyptian Society for Accountants and Auditors (an organization similar to the United Kingdom's Royal Society of Chartered Accountants and the United States' Certified Public Accountants).

The founder of the company, Mr. Shawki, Sr., received a B.A. in Commerce in Cairo, worked for the government for a while and then another accounting firm before starting his own company. Over the years, several managers have been sent to Europe for training. Mr. Shawki is now a Fellow in the Egyptian Society for Accountants and Auditors.

Technology export opportunity for Shawki and Company came from both the company's own initiative and the host government's request.

Shawki & Co.'s motives for entering the technology export market were (in order of importance): (1) Higner profits abroad;

(2) the existence of excessive capacity; (3) exploit accumulated experience and know-how; (4) and a request by the host country government.

There was no difference in the sophistication of the export work of Shawki & Co. in comparison with domestic.

Only minor adaptations were required in the form of fresh technological effort in order to mount the export project. These included additional training for taxation and new laws in different countries.

The nature of Shawki & Co.'s advantage over its non-Egyptian competitors was the cost of technology and the cultural links which, as an Egyptian company, it shared with other Middle Eastern countries in which it was operating. Also, the company claimed superior quality of the services which it provided was the company's main advantage over its fellow Egyptian firms. However, the company did have some disadvantages over its foreign competitors in that their range of services was not as complete as some of the competitors. However, they are taking steps to remedy the situation by supplementing their seminars with an Introduction to Management Consultancy and computer sources.

In each country to which Shawki & Co. exported its services, they needed a domestic person or firm as a partner in the transaction, due to formal requirements of host countries. (Occasionally, the domestic partner was only a formality and served as a partner in

name only.) The companies for which Shawki & Co. provided services were private entities as opposed to state-owned enterprises or government institutions.

Foreign markets were first explored in Libya between 1954-55 through the personal contact of the founder, Mr. Shawki, Sr. Later they expanded their market to Kuwait.

Information on potential customers is obtained through personal contact. Bids for services are made through direct personal negotiation.

Foreign collaborators are found both through the initiative of the collaborator and through the initiative of Shawki & Co. Collaboration arrangements with foreign firms were dependent upon the political climate between Egypt and the country in which Shawki & Co. was working, as was the extent of the company's foreign activities.

Financing is arranged by both parties. However, in some countries, the arrangements had to be majority foreign-owned in which case Shawki & Co. took the maximum equity percentage allowed by the laws of the country in question.

The major problems encountered by the company were getting new ideas accepted and maintaining the minimum level of education and training required to absorb accounting technology and other services provided by the company.

In the future, the company plans to enter new markets (the

United Arab Emirates and Bahrain) and enlarge existing offices in Saudi Arabia and Kuwait.

In the technology export project, Shawki & Co. received help in the form of training provided by private experts and also in new Egyptian laws which clarified the old, ambiguous laws. Shawki & Co. evaluated this help as "important" in terms of real value on a scale of "Decisive," "Important," and "Non-important."

Asked what they would suggest regarding the improvement of the promotional system for the export of technology, the company suggested that simplyfying the bureaucracy for the paper work required when conducting business abroad would improve the promotional system and . nce the volume of exports of Egyptian technology and know-how.

They suggested that the function of international organizations might be to make sure that the aid, credit, or loan funds be channelled, controlled, and managed properly and that they be included in the list of auditors and management consultants acceptable in connection with such projects.

Shawki & Co. expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis. However, they felt that it would be a waste of time if the co-operation did not provide any beneficial results.

The following three tables contain pertinent data on the company. Table 1 presents employment, production and export data.

Table 2 gives export data by destination in various years. Table 3 gives data on volume and number of management and other consulting services abroad in various years.

TABLE 1, Shawki & Co.: Employment Production, And Exports

	EMPLOYMENT	PRODUCTION in U.S.$	PRODUCTION in LE	EXPORTS in U.S.$	EXPORTS in LE
1970	30[1]	100,000[1]	39,000[2]	450,000[1]	175,500[2]
1973	30[1]	100,000[1]	39,000[2]	510,000[1]	198,900[2]
1974	35[1]	150,000[1]	58,500[2]	650,000[1]	253,500[2]
1975	40[1]	200,000[1]	78,000[2]	760,000[1]	296,400[2]
1976	45[1]	250,000[1]	97,500[2]	880,000[1]	343,200[2]
1977	60[1]	300,000[1]	117,000[2]	950,000[1]	370,500[2]
1978	70[1]	350,000[1]	136,500[2]	240,000[1]	93,600[2]
1979	90[1]	450,000[1]	315,000[3]	260,000[1]	182,000[3]
1980	110[1]	550,000[1]	385,000[3]	280,000[1]	196,000[3]
1981	130[1]	650,000[1]	455,000[3]	300,000[1]	210,000[3]

[1]Provided by the Company.

[2]Converted at the official IMF exchange rate of $2.55 per LE.

[3]Converted at the official IMF exchange rate of $1.43 per LE.

Table 2, Shawki & Co.: Export Performance by Destination

	Kuwait		Rest of Third World	
	in U.S.$	in LE	in U.S.$	in LE
1970	100,000[1]	39,000[2]	350,000[1]	136,500[2]
1973	110,000[1]	42,900[2]	400,000[1]	156,000[2]
1974	150,000[1]	58,500[2]	500,000[1]	195,000[2]
1975	160,000[1]	62,400[2]	600,000[1]	234,000[2]
1976	180,000[1]	70,200[2]	700,000[1]	273,000[2]
1977	200,000[1]	78,000[2]	750,000[1]	292,500[2]
1978	240,000[1]	93,600[2]	-	-
1979	260,000[1]	182,000[3]	-	-
1980	280,000[1]	196,000[3]	-	-
1981	300,000[1]	210,000[3]	-	-

[1]Provided by the Company.

[2]Converted at the official IMF exchange rate of $2.55 per LE.

[3]Converted at the official IMF exchange rate of $1.43 per LE.

Table 3, Shawki & Co.: Value and Number of Management and other Consulting Services Abroad

YEAR	NUMBER	AMOUNT (in U.S.$)
1970	20	$200,000
1973	22	$300,000
1974	25	$500,000
1975	25	$600,000
1976	25	$600,000
1977	26	$600,000
1978	20	$200,000
1979	20	$200,000
1980	21	$200,000
1981	22	$200,000

Source: The Company.

CASE #2

Engineering and Industrial Design Development Centre*

EIDDC is a rather unique publicly-owned R&D institution established in 1968 as a joint project of the Egyptian government and UNIDO. Its purpose is the development of engineering products, plant lay-outs, material handling systems, and training. Its functions include providing technology for household (kitchen) appliances, solar energy research, rural-area products (kerosene heaters, harvesting machines), transportation, building equipment (concrete mixers), wind energy (wind mills), designing institutions (National Institute for Iraq), knowledge and information transfer (African Center for Engineering Design-Nigeria and TIRO (Industrial Development Center-Tanzania), Design plants, and small-scale development programs to promote their exports through the World Bank and other international institutions and mechanisms.

The Centre was established to develop the national capabilities of the industry to innovate and develop new products, processes and manufacturing plants, i.e., development of the local ability to develop local technologies and products appropriate to the enviroment from the point of view of consumer customs, the

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*Information used in writing this case has included the interview with the Centre Director and other officials, visits to the Centre, and material published by the Centre including Industrial Development (no date), a quarterly bilingual (Arabic and English) periodical published by the Centre, especially Yousef Mazhar, "Technology For the People: The Role of EIDDC in Egypt," pp.54-50.

manufacturing process, and local availability of raw materials.

Activities included:

1 - Industrial product design and development, including consumer goods, transportation equipment, machinery etc.

2 - Capital goods equipment design, including heavy equipment, material handling equipment etc.

3 - Production technology and tool design, including press tools, plastic molds.

4 - Process design.

5 - Mechanical workshops, prototype and tool manufacture.

6 - Heat treatment workshops and mechanical laboratories.

Later, other divisions dealing with training, industrial information, as well as a financial and administrative division, were established.

The Centre, which is located on two sites in Cairo has about 400 employees (sixty engineers, forty draftsmen, as well as skilled workers, administrative and supporting staff), headed by an Egyptian Director General, who is also the Project Manager.

United Nations experts (UNIDO and ILO) and consultants and short-term experts also are made available to the Centre.

The Centre used to work mainly with the public sector companies, but lately has increased its activities with other joint venture establishments and with the private sector. Although the Centre is still a national one, some work has already been done for other neighboring states and still more requests are coming, according

to the Centre.

The Centre also offers specialized training courses on tool room practice and several other practical subjects, chosen according to the problems which the participants have faced in their everyday industrial practice. Due to their very practical orientation, these courses have proved highly successful.

The training courses are designed for about twenty-five participants and last for between one to two weeks. The participants come from various Egyptian factories, lately also from other Arab states and African states. Participation is provided for a nominal payment. The courses are prepared and held by the experts and counterpart engineers. The languages used are Arabic and English.

The Centre also accepts engineers and designers for on-the-job training in various specialized fields. The duration of the training varies from two months to one year. The main fields of specialization are in the industrial engineering field. The Centre has more than 1,000 trainees per year at the moment.

The Centre has acquired increased recognition and support from the government authorities as well as from the UNDP and UNIDO.

Due to the results reached by the Centre and increased demand for further development of it, the government had decided to attach the previous Institute for Small Scale Industries (established in 1963 with financial and technical assistance from the ILO) to the Centre. Therefore, the Centre now has two locations; one is the Dar El Salam Centre on the old road of Meady (a Cairo suburb). The other is the Pyramid Institute, on the Pyramids Road in Giza, near Cairo.

The first attempts at designing products through prototype technology in the late 1960s, with hopes of marketing these designs, resulted in very limited success due to the complicated nature of the products. The designs called for very complicated manufacturing processes, and the industry to which EIDDC was trying to sell the designs was skeptical about EIDDC's ability to develop designs outside of the industry's own R&D units. Later, the Centre began designing cooking stoves, with greater success.

EIDDC works as a consultancy and technical service centre for the engineering industry in Egypt. Activities include product design and development to satisfy the export specifications and needs. They also design jigs and fixtures, tools, etc. in order to improve the quality of production. EIDDC has the following technical divisions:

1) Product Design and Development Division

2) Industrial Design Section

3) Processing (or Capital Goods) Equipment Design Division

4) Engineering (or Production Technology and Tool Design)

5) Process Design Division

6) Workshop Division for manufacture of prototypes and special tools

7) Heat Treatment and Materials Test Division

8) Training Division

9) Documentation and Information Division

10) Small Scale Industry

The sources of technology which EIDDC originally exploited were the following organizations: UNIDO (which provided technical assistance), ILO, USAID, and GTZ (a West German organization). The Centre's machinery was imported from both Eastern and Western Bloc countries. There were significant costs and difficulties in making improvements and adaptions in the imported technology.

Since 1973, several of the executives have received training in Egypt and abroad. Dr. Eng. Yousuf Mazhar, the president of the organization, received a degree in Mechanical Engineering at Cairo University before receiving a Ph.D. from Berlin University, West Germany. The six division heads of the organization received training abroad (some before joining the Centre), and all participated in UNIDO-sponsored training programs. All of the top executives and most of the engineers have had training abroad.

Situated in Cairo within the Arab and African regions, the Centre has been directly involved in various activities in the areas. This has sometimes been directly to countries, but also through the different Arab and African regional organizations in the area, as well as through the bilateral agreements with other countries. Some of the prominent examples are given below.

(a) Participation in a regional study of the electrical industries in the Arab World in collaboration with the Industrial Development Centre for Arab States (IDCAS). This involved sending study teams to Arab countries for study and information gathering. An Arab Meeting for Electrical Industries was later held in Cairo which discussed and reviewed the situation of the Arab Electrical Industry. One of the recommendations of the meeting was the setting up of an Arab Federation of Engineering Industries, now active in Baghdad, Iraq.

(b) The design and running of a training course in Industrial Engineering in a number of neighboring countries.

(c) Active participation with the U.N. Economic Commission for Africa (ECA) in the field mission for the African Regional Centre for Engineering Design.

(d) Participation in the studies for the Basic Materials

and Engineering Industry Development Programmes at ECA.

(e) Cooperation with the UN Economic Commission for Western Asia (ECWA) on technology meetings.

The technology exports of various types mentioned above came about both through the initiative of EIDDC and through the recipient firm's request.

The motives for entering the technology export market were (in order of importance): (1) To exploit accumulated experience and know-how; (2) The existence of excessive capacity and corporate policies; (3) A request by their own government; and (4) A request by the host country government.

The nature of their technology export is in-plant training programs for non-Egyptians (funded by UNIDO).

Technology export is directed to Syria, Jordan, Iraq, and other Third World countries (including Tanzania).

Usually minor, but occasionally significant changes are made in the existing technology as the needs in each of the count ies to which technology is exported is different than Egypt's needs.

The advantages that EIDDC had over its competitors were the cost of technology and the political, commercial, and cultural links which it had with the countries to which the Centre was exporting technology.

The training provided by E'DDC was occasionally aided by UN experts.

The technology importers were both private and state-owned companies. However, in the cases of Tanzania and Iraq, which involved private companies, the Egyptian government initiated the technology export since UNIDO doesn't deal directly with private entities.

Most foreign customers were obtained through the initiative of UNIDO. However, in the case of Iraq, the Iraqis contacted the Industrial Development Center of the Arab States (a specialized agency of the Arab League) and they passed on the job request to EIDDC.

Information on potential customers was obtained through UNIDO. Bids for the work to be done were submitted in the form of a proposal.

EIDDC solves technology problems according to request. However, they have no active technology export plans for the future. There exists too many technological problems at home.

EIDDC suggested that the promotional system could be improved through additional financial aid. They also suggest that the international organizations can assist by providing technical assistance, experts, fellowships, equipment, and information. EIDDC also expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis.

Table 1

EIDDC's Employment and Annual Budget for the years 1970 and 1973-81

Year	Employment	Annual Budget in U.S.$	Annual Budget in LE
1970	120	-	-
1973	250	-	-
1974	275	-	-
1975	325	-	-
1976	358	-	-
1977	382	1,326,000[1]	520,000
1978	390	1,428,000[1]	560,000
1979	400	986,700[2]	690,000
1980	423	883,740[2]	618,000
1981	453	883,740[2]	618,000

Source: Information provided by the Centre.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

Case #3

EGYPTIAN SUGAR AND DISTILLATION COMPANY

(SOCIETE DES SUCRERIES ET DE DISTILLERIE D'EGYPTE)

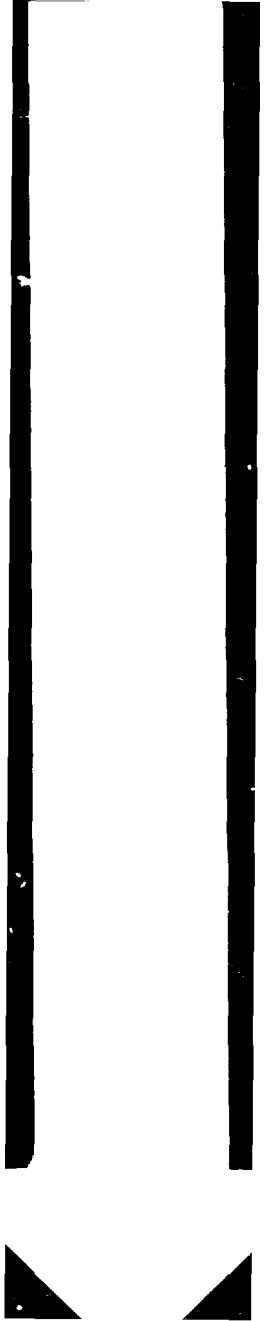
The Egyptian Sugar and Distillation Company is a very large public sector company which began operation as a private company well over a century ago in 1855. It was nationalized in 1956.

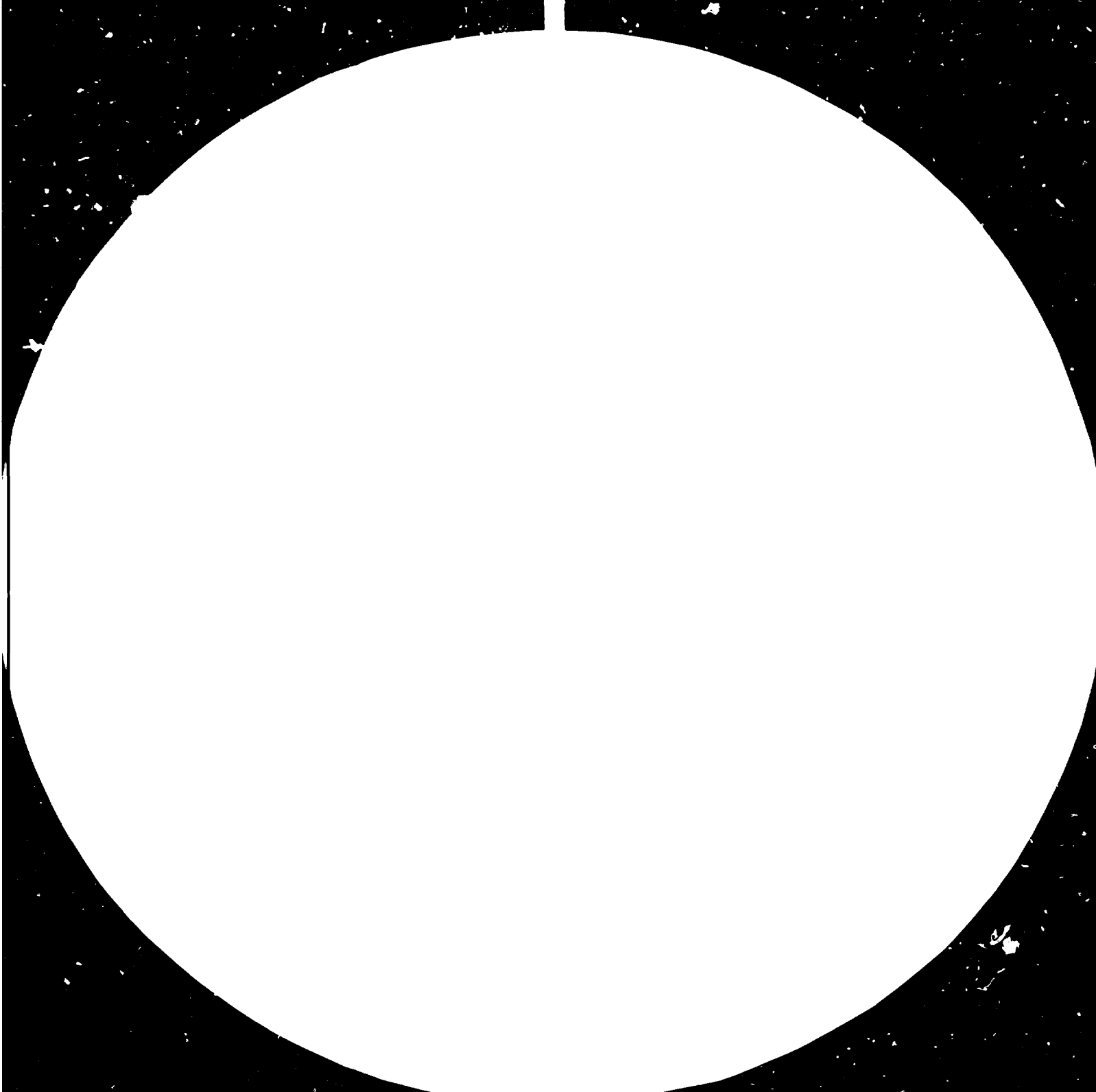
The company produces sugar and its by-products, bagasse pulp, alcohol, acetone, cosmetics, adhesives, phenols, machinery parts for the foundary, and steel construction. It is, therefore, large both in size (21,190 employees, LE 166 million in production, and LE 19.7 million in exports in 1980) and also in the range of products.

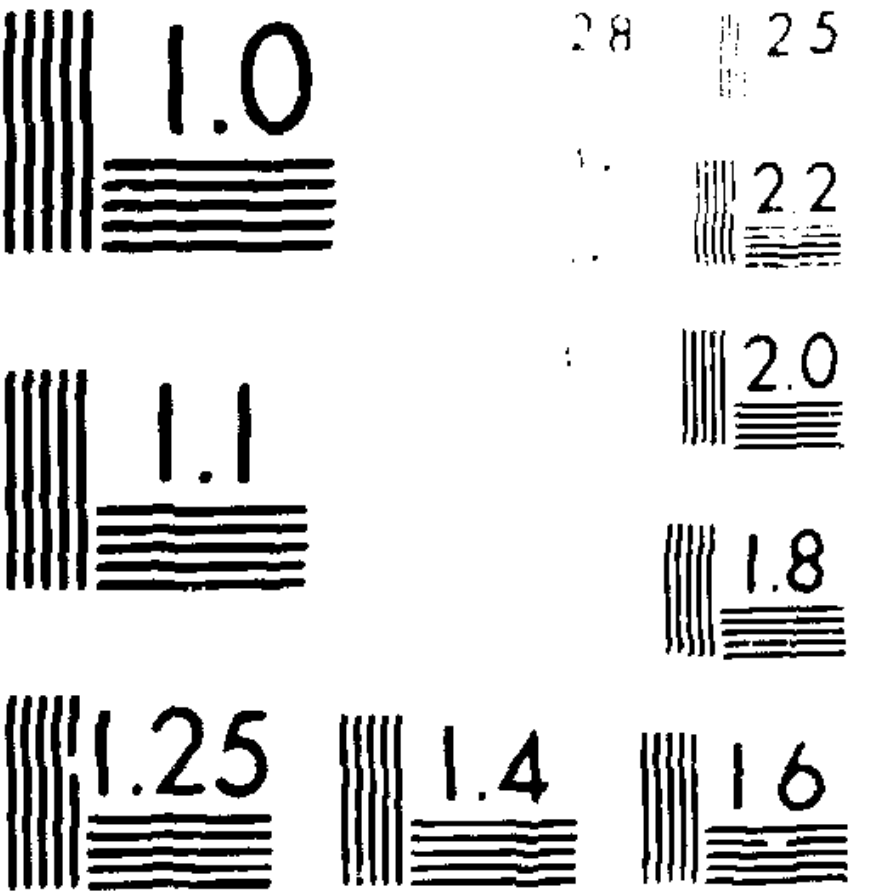
The company exports molasses to Europe, sugar to Africa, and alcohol to the Sudan and Africa.

The company's organizational development strategy consists of exploring all possibilities for providing training in French and English with respect to the sugar technology of the company, as they have already trained individuals from the Sudan, Morocco, and the Ivory Coast. They plan to have a training center with UNIDO's assistance starting in 1982. They also plan to continue their R & D on the agricultural problems related to sugar cane, using their expanded research laboratory on sugar.

Some of the technology used by the Egyptian Sugar and Distillation Company was developed locally over the more than 100






1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

years the company has been in existence as a result of research within the company. Some of these technologies have been patented.

The company is involved in significant R & D activities with over 100 persons employed in this capacity. They have patented the "Egyptian Cane difiusal" system; developed the technology for the production of acetone butanol by the fermentation of molasses; developed a system for the purification of sodium sulphate (found locally); and they grow some of their varities of sugar cane by cross-fertilization. The fermentation process was so advanced according to the company, that a European firm licensed from them this technology. They claim to have the technological lead on the diffusal process. While not the first to develop it, they said they were the first to develop it in the most feasible and most economical method.

The president of the company is said to enjoy international recognition. He is known to UNIDO, FAO, and other international organizations, according to the company.

At least 20 of the management personnel have received training abroad. Training includes on-the-job training and tours which employees take of factories abroad in order to observe their procedures.

Technology export opportunity came about both through the initiative of the Egyptian Sugar and Distillation Company and through the recipient firm's request.

The motives behind the company's entering the technology market were (in order of importance): (1) Higher profits abroad and (2) To exploit their technological lead.

The nature of the Egyptian Sugar and Distillation Company's technological exports includes patent license, know-how license, consulting, engineering, management services, technical assistance, and labor supply.

The company exports technology to the U.S.A., Canada, Western Europe, Oman, Iraq, Sudan, Morocco, and other LDCs.

The sophistication of their export work in comparison with the work they do domestically depends on the request and the job. Some jobs require more sophisticated technologies, some less sophisticated ones. The company does feasibility studies, technical studies, and engineering studies.

They have indicated that both minor adaptions and additional R & D work is required in the technological effort to mount the export project. For example, in Egypt they have bone charcoal for use in the decolorization process. However, in some countries, this is not available. The company advises the recipient of their technology to use other methods of decolorization as the advisable chemical treatment.

The advantages the company has over its competitors are its cost advantage, the cultural links it has with other Middle Eastern countries, and its technological lead over its competitors.

Employees of the company are also eager to export training and give instructions abroad on an independent, individual basis because of job security guaranteed by the company. Any employee of the company who goes abroad with the authorized leave of the company can't be fired.

The company does not have an active export strategy. They merely go abroad when asked, rather than actively seeking out clients. In the case of the Ivory Coast company, the technology export was requested by the UN.

The parties to which Egyptian Sugar and Distillation Company exports are state-owned companies. For instance, the organizations that the company exported to in Iraq, the Ivory Coast, and the Sudan were government-owned companies.

Information on potential customers was obtained through the governments of the country to which they were exporting and through meetings, studies and negotiations.

The company nominated personnel to do the job requested. In the case of technological exports to Europe, the technology was patented. The recipient firm paid the Egyptian Sugar and Distillation Company for the training of their personnel in how to use it. The financing for the projects were provided by the client.

The major problems encountered was obtaining the necessary data needed to give proper training and in applying technology

to the individual cases.

The company drew up licensing agreements for exporting technology. One licensing agreement called for terms requiring a percentage of the royalty based on the ex-factory price of machinery for 10 years and renewable for another 10 years.

As a result of the licensing agreements on their patented technology, they receive feedback from the licensee on the performance and problems with the technology.

The company's technology export plan for the future is merely to respond to requests for technology.

Their suggestion for improvement of the promotional system is to continue the present policy of employment in guaranteeing job security for those employees who choose to go abroad.

The Egyptian Sugar and Distillation Company indicated a willingness to cooperate with the UNIDO/INTIB system on a continuous basis.

The following table shows some basic data on the Egyptian Sugar and Distillation Company:

Table 1: Basic Data on Egyptian Distillation Co.

	1975	1979	1980
EMPLOYMENT			21,190
Production			
in U.S.$	219,922,200[1]	156,080,210[2]	237,829,020[2]
in LE	86,244,000	109,147,000	166,314,000
EXPORTS			
in U.S.$	55,347,750[1]	28,838,810[2]	28,259,660[2]
in LE	21,705,000	20,167,000	19,762,000

Source: GOFI

[1]Converted at the official (IMF) exchange rate of $2.55 per LE.

[2]Converted at the official (IMF) exchange rate of $1.43 per LE.

Motives behind ERISCOM's entering the technology export market were (in order of importance): (1) Higher profits abroad and (2) In order to exploit their accumulated experience and know-how and threats to existing markets.

ERISCOM indicated that there was no difference in the sophistication of erected goods (equipment and materials) and delivered equipment abroad in comparison with work done domestically.

Only minor adaptions were required in the technological effort needed to mount the export project. This included training for the staff, both at home and abroad, in the use of new and up-to-date materials and facilities.

ERISCOM's advantages over its competitors include the political, commercial, and cultural links which it shares with the countries to which it exports and its experience in dealing with foreign buyers.

In some projects they used foreign companies in joint-venture agreements. The technology importers were state-owned companies. Foreign markets were first explored through personal and official contacts. Information on potential customers was obtained during the negotiation period.

Licensing agreements on the exported technology were one lump-sum agreements which included the total project costs plus

additional payments for a certain period.

Indirect financial earnings are gained through the provision of complementary exports of capital and intermediate goods and the occasional supply of management services.

Technology export provided some feedback to domestic technological activity through additional adaptions.

Their export plans for the future were still under study at the time of the interview.

They suggested that the promotional system could be improved by more information and subsidies from the government.

They also suggested that the role of the international organizations might be to provide experts in the field of technical assistance (for mechanical and electrical erection), to provide information on up-to-date technology and methods of erection, and to provide on-the-spot and abroad training for the company's staff.

ERISCOM indicated a willingness to co-operate with the UNIDO/INTIB system on a continuous basis. The following tables provide employment, production and export data for ERISCOM.

Table 1

ERISCOM Employment and Production, 1974-81

Year	Employment	Production in U.S.$	Production in LE
1974	1,293	7,038,000	2,760,000
1975	1,983	6,732,000[2] 9,284,550[2]	2,640,000[1] 3,641,000[1]
1976	2,034	10,133,700	3,974,000
1977	2,682	13,247,250	5,195,000
1978	2,745	14,412,600	5,652,000
1979	2,700	8,500,000[3] 7,328,750[3]	5,971,000[1] 5,125,000[1]
1980	2,740[1] 2,315[1]	7,301,580	5,106,000
1981	2,800	9,420,000	6,590,000

Source: Information provided by the company, unless otherwise indicated.

[1] GOFI data.

[2] GOFI data converted at the official IMF exchange rate of $2.55 per LE.

[3] GOFI data converted at the official IMF exchange rate of $1.43 per LE.

Table 2

ERISCOM Exports, 1977-81

Year	Country	Exports in U.S.$	Exports in LE	Total
1977	Iraq	2,206,000	860,340[1]	$2,236,000
	Africa	30,000	11,700[1]	LE872,040
1978	Iraq	1,411,000	550,290[1]	$1,411,000
				LE550,290
1979	Iraq	893,000	625,100[2]	$893,000
				LE625,100
				$929,500[3]
				LE650,000[3]
1980	Iraq	602,000	421,400[2]	$602,000
				LE421,400
				$709,280[3]
				LE496,000[3]
1981	Iraq	1,548,000	1,083,600	$1,548,000
				LE1,083,600

Source: Information provided by the company.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

[3]GOFI data.

CASE #5

EL NASR AUTOMOTIVE MANUFACTURING COMPANY

El Nasr Automotive Manufacturing Company is a public entity established in 1958. Its products include passenger cars, trucks, buses, trailers, and agricultural tractors.

El Nasr exports its products, primarily passenger cars and buses, to Kuwait, Iraq, Morocco, Algeria, and Libya. It reported exporting about $2 million in 1974, $3 million in 1975 and $4 million in 1976 in passenger cars alone. It also exported 90, 40 and 54 buses in 1974, 1975 and 1976, respectively. Table I gives employment, production and export figures for 1973-81.

In 1981, the company was producing about 20,000 passenger cars and 600 buses. Its plans include increasing the production of passenger cars to 35,000 and that of buses to 1,400 (see Table 2).

The company's organizational development strategy includes an intention to go to joint venture agreements. They believe that the licensor will have a stronger interest if it is given an equity interest. They plan to have three joint venture agreements with FIAT, and Magirus-Deutz.

The technology currently used by the company originally came from FIAT, CEAT (FIAT's Spanish affiliate), and Psloski (a Polish affiliate of FIAT) for passenger cars; Magirus-Deutz and KHD of West Germany for trucks and buses; Blomhardt (a West German company) for trailers; IMR (a Yugoslav company) for tractors; and Massey Ferguson

(a one-time contract for the assembly of 2,000 tractors).

Some of the technology which El Nasr imported from abroad had to be modified. For example, the body of the buses had to be re-designed, and changes had to be made in the specifications of the FIAT engines to fit the Psloski cars. Any modifications made must be sent first to the licensor for their approval (i.e., changes in specifications, materials, etc.) including changes in locally-made parts and the adoption of local components. Should they need to change suppliers, they must send to the licensor a sample of the proposed substitute component(s) for their approval.

The motives behind the changes were market needs. For example, they had to modify the design of the buses because heavy-duty buses were needed for the markets which El Nasr was servicing. A typical Cairo Public Transit Bus -- most of which are produced by El Nasr -- will have several million miles on it before it is worked to destruction.

El Nasr claims to be engaged in significant R & D activity, with 120 persons employed for this purpose including 20 engineers and 100 technicians. They have a research and test shop for making prototypes with technical assistance from the technology suppliers. In addition, the company has an in-house training center as well as an institute for training of technicians and other training programs which are sponsored by the Ministry of Industry. In the last few years, the company has suffered from an accelerated drainage of

skilled workers to private industry and to oil-rich countries. To retain maximum number of skilled workers, the company is now paying up to 150% of base salary as bonus pay, since lower pay in public sector companies relative to private sector, and abroad relative to domestic have tended to be a major cause of this drain, according to the company.

Ten percent of El Nasr's top management have some training abroad. The Deutz agreement provides for the training of 150 persons per year in one-year training courses. There is a similar but irregular agreement for three month training sessions with FIAT.

The technology export opportunity came about for El Nasr through the Egyptian Government's request. Bilateral governmental trading arrangements were consumated whereby El Nasr products would be exported to certain (friendly) countries for a multitude of purposes. Some of these were economic; others non-economic.

Thus, when asked about the motives behind entering the technology export market, the company's responses were (in order of importance): (1) Corporate policies -- since the company had after-sale service, they wanted skilled workers to be able to repair their products, and (2) a request by the Egyptian government.

El Nasr's direct technology export is in the form of training for the purpose of after-sale service. This is directed to Kuwait (on an irregular basis -- determined by need), Iraq (20 persons), Libya (on an irregular basis), and Algeria (on an irregular basis --

only 150 buses were imported by Algeria). An indirect but significant form of technology export by El Nasr (and many other Egyptian firms) is the departure of skilled manpower -- some trained by the company -- to oil-rich Arab states.

They have rated the export work as less sophisticated than that done domestically. The main advantage El Nasr had over its competitors in the export markets were the political, commercial, and cultural links which it shared with the parties to which it was exporting.

The technology importers were state-owned enterprises. The buyers provided the financing for the technology export.

El Nasr received help from the Egyptian government in that the Egyptian government encouraged the export and they received help from the Iraqi government which provided aid in helping with customs duties and production which enabled them to sell buses at less than half the price of Egypt's selling price. They rated this help as "important" on a scale of "Decisive," "Important," and "Non-important."

Tables 1, 2 and 3 provide additional data on El Nasr Automotive Manufacturing Company.

Table 1

El Nasr Automotive: Production (units) of Manufactured Goods for 1981 and Projected Figures for 1985

	Passenger Cars	Buses	Trucks*	Tractors
1981 Actual Production	20,000	600	4,200	1,500-2,000
1985 Projected Production	35,000	1,400	6,000	5,000

Source: The company.

*4- to 25-ton capacity.

Table 2

El Nasr Automotive Manufacturing Company
Number of Persons Trained From Abroad, 1973-1980-81

Year	No. of Persons Trained
1973	250
1974	200
1975	300
1976	200
1977	200
1978	220
1979	100
1980-81	160

Source: The Company.

Table 3

El Nasr Automotive Manufacturing Company: Employment, Production, and Exports 1973-80

Fiscal Year	Employment	Production in U.S.$	Production in LE	Exports in U.S.$	Exports in LE
1973	9,800	58,650,000[1]	23,000,000		
1974	10,400	81,600,000[1]	32,000,000		
1975	10,800	96,900,000[1] 98,205,600[3]	38,000,000[2] 38,512,000[2]	31,635,300[3]	12,406,000[2]
1976	10,400	114,750,000[1]	45,000,000		
1977	11,800	204,000,000[1]	80,000,000		
1978	11,800	201,450,000[1]	79,000,000		
1979	10,000	148,720,000[4] 144,705,990[5]	104,000,000[2] 101,193,000[2]	54,787,590[5]	38,313,000[2]
1980-81	9,700[2] 11,700[2]	153,010,000[4] 116,187,500[5]	107,000,000[2] 81,250,000[2]	4,647,500[5]	3,250,000[2]

Source: The Company.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Data provided by GOFI.

[3]GOFI data converted at the official IMF exchange rate of $2.55 per LE.

[4]Company data converted at the official IMF exchange rate of $1.43 per LE.

[5]GOFI data converted at the official IMF exchange rate of $1.43 per LE.

Case #6

HELWAN MACHINE TOOL COMPANY

The Helwan Machine Tools Company is a public entity established in 1960. It produces machine tools and provides technical services in the field of engineering. It is one of the several industrial entities established with Soviet technical assistance in the Helwan industrial estate near Cairo.

The company's organizational development strategy currently emphasizes manufacturing for the domestic market. Its R & D activities, according to the company plan, include (1) Making improvements on existing products; (2) Reverse engineering; (3) Designing new products for the simple and standard technology of their clients. Their R & D organization consists of the company's departmental heads and is headed by a chairman. R & D is figured into the company's budget as a separate and explicit item.

The sources of technology originally exploited by the company were Russian. Now, they import their technology from a West German firm under a 3-year licensing agreement. The agreement consists of a lump-sum fee plus technical assistance and training costs. The manufacturing started with assembly from CKD packs. The company plans to increase the local content up to the point of performing casting at the factory. The technology importing agreement with

the Russians was very inexpensive. The only charges to the company were the costs of printing the instructions. This arrangement was terminated in 1974-75.

Technology export in the form of technical assistance in machine tools to Iraq came about through the company's own initiative, as well as request by the Iraqi recipient firm. Their motives for entering the technology export market were (in order of importance): (1) Higher profits abroad; (2) Corporate policies; and (3) to exploit their accumulated experience and know-how.

Significant adaptations were required in the existing technology in order to mount the export project, according to the company, who stated that in about 10% of the cases, exported technology was "more sophisticated" than that used in domestic operations.

The advantages which used the Helwan Machine Tool Company had over its competitors were a) the political, commercial, and cultural ties which it shared with the recipients of its technical assistance, and b) the cost of their technology. The company used no foreign callaborators. The technology imported was state-owned enterprises.

The company had no active plan to seek out clients for technology exports. The recipient firms sought them out. A possible explanation may be that the company can utilize all its capacity responding to their expanding domestic market. However, in the future, the Company hopes to expand its market for technology export.

There were no bids for the technology export, although the importer did have cost estimates from other companies. The Company indicated that no major problems were encountered in this technology export endeavor.

The terms of licensing of the technical assistance provided by the Company consisted of a per man/per month charge.

The technology export provided feedback to the domestic technological activity through the knowledge gained by the utilization of new systems in the technical assistance project.

The Company made no suggestions for the improvement of the promotional system for the export of technology. They expressed a desire to "stand on their own feet".

The Company expressed a willingness to cooperate with the UNIDO/INTIB system on a continuous basis because they said they needed all the information they could get on machine tools.

CASE # 7

GENERAL COMPANY FOR PAPER INDUSTRY (RAKTA)

Established in 1958, RAKTA is a publicly owned company, although 15-16% of its shares is privately owned. The major shareholders' equity was nationalized in 1961 while those of small shareholders remained unaffected.

RAKTA is an integrated papermill; its products range from the raw material to the end product, including pulp, paper and board.

RAKTA's organizational strategy involves developing alternative (non-wood) sources for pulp and paper manufacturing, using Egypt's relatively more abundant agricultural resources. This is due to the low availability of wood in Egypt. This project is financed by UNIDO and other sources. It also plans to establish a central laboratory for R & D activity and a pilot plant which will create 15 jobs for this project and an additional 50 for quality control from the present employment of 2,157 persons. Other components of the Company's strategy include concentrating export to the Third World; recovering chemicals and energy from black (waste) liquor; the upgrading of wastepaper for improving the end product quality and saving energy; and developing new technology for the production of paper pulp, animal feed, and fertilizer from agricultural residues.

The technology originally exploited within the organization came from West Germany, East Germany, Japan, and the U.S., including turnkey projects. The first of these was a mill built by four German

companies. A flat fee was charged by the technology suppliers.

RAKTA made significant changes in the imported technology, especially in the cleaning and cooking of the straw and bleaching the pulp. This included changing to wet-cleaning the straw; changing from the batchwise to continuous cooking of the straw; from long-cycle to short-cycle bleaching of pulp; separate bleaching of straw and from bagasse pulp to mixed pulp bleaching.

The motives behind the change in technology were: (1) cost savings and (2) improved performance. The costs and difficulty of making these changes were minor - methods were developed through additional R & D.

R & D activities within the organization are significant. RAKTA had, at the time of the interview, 15 persons employed in R & D activity. The company pioneered in the utilization of rice paper in the 1960s. Now they are pioneers in the recovery of chemicals. Although RAKTA conducts joint research with West German companies for the purpose of technology exports, the main technology was developed in Egypt. RAKTA has one patent for the wet-cleaning of straw which was developed by one employee before joining the company. RAKTA plans to hav its new method for the recovery of chemicals patented.

More than 70 of their management and technical staff had their formal education and training in West Germany, Norway, Romania, the U.S., Italy, and Switzerland at the company's expense.

Technology export came about through the initiative of RAKTA, the recipient firm's request, and through a consortium of their original sources of technology which they joined after solving their own technological problems. Through the Consortium, they delivered paper mills to Iran, Iraq, and Pakistan. A mill was delivered directly from RAKTA after it received permission from other consortium members.

The motives behind RAKTA's entering the technology export market were (in order of importance): (1) Higher profits abroad; (2) Corporate policies; and (3) Request by the host country government.

In addition to the several private and state-owned firms to which RAKTA exported technology via the Consortium, it is involved in providing direct technological assistance to an Iraqi firm.

RAKTA stated that there is no difference in the sophistication of the export work as compared to that done domestically.

Significant changes in existing technology and additional R & D work was required to mount the export project, according to the company.

RAKTA had no competitors in the field in which it exported technology. The company has unique expertise, they said. Even their European (Consortium) partners wanted them to do the technological work.

Between technology supplied via the Consortium and its direct exports, RAKTA had several technology exporting clients, including both private and state-owned entities.

Foreign markets were first explored through the initiative of the importer who came to them as a result of conference papers, etc. Also, through private communication. Information on potential customers was obtained through the request of RAKTA.

Foreign collaborators were found through the Consortium. The collaborative arrangements with foreign firms usually consisted of RAKTA and 2-3 West German companies.

Financing was arranged through an agreement which was signed by the recipient for RAKTA's technical services.

Indirect financial earnings associated with the technology export included accumulated experience and prestige.

RAKTA did not receive much feedback from its technology export. Due to a change in policy by the Government, RAKTA was constrained from seeking additional technology export markets.

Technology development plans for the future include chemical recovery, the up-grading of waste-paper, and new technology for making animal feed, fertilizer, and pulp from agricultural residues. The company hopes to be able to export these and other related technologies about which it feels confident.

RAKTA received help from UNIDO and the German government and companies in its technology export endeavors. This aid, in the form of equipment and experts, was rated by RAKTA as "important" (on a scale of "Decisive", "Important", and "Non-important").

RAKTA suggested that the promotional system for encouraging the export of Egyptian technology could be improved with more

information, financial aid, financial incentives, and technical and administrative aid.

RAKTA also suggested that the role of the international organization might include providing financial and technical assistance.

RAKTA expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis.

The following table contains data on RAKTA's production, export and employment for various years.

Table 1

RAKTA: Employment, Production and Exports

	EMPLOYMENT	PRODUCTION		EXPORTS	
		in U.S. $	in LE	in U.S. $	in LE
1970	2,490[1]	22,470,600[4]	8,812,000[1]	122,556[4]	48,061[3]
1973	2,433	24,225,000[4]	9,500,000[1]	48,070[4]	18,851[3]
1974	2,388[1]	30,087,450[4]	11,799,000[1]	105,616[4]	41,418[3]
1975	2,384[1]	43,877,850[4]	17,207,000[1]	13,520[4]	5,302[3]
1976	2,405[1]	37,857,000[4]	14,846,000[1]	20,936[4]	8,210[3]
1977	2,443[1]	41,404,350[4]	16,237,000[1]	9,774[4]	3,833[3]
1978	2,364[1]	42,342,750[4]	16,605,000[1]	43,120[4]	16,910[3]
1979	2,305[1]	26,803,920[5] 26,782,470[6]	18,744,000[1] 18,729,000[2]	52,690[5]	36,846[3]
1980	2,290[1] 2,880[2]	30,602,000[5] 30,573,400[6]	21,400,000[1] 21,380,000[2]	5,671[5]	3,966[3]
1981	2,157[1]	30,789,330[5]	21,531,000[1]	7,113[5]	4,974[3]

[1] The Company.

[2] GOFI data

[3] Annual value of technology exports (provided by The Company). The company reported no merchandise exports during these years.

[4] Converted at the official IMF exchange rate of $2.55 = 1 LE.

[5] Converted at the official IMF exchange rate of $1.43 = 1 LE.

[6] GOFI data, converted at the official IMF exchange rate of $1.43 = 1 LE.

Case #8

EL NASR SALINES COMPANY

One of the two oldest firms in our samples, El Nasr Salines Company is a public sector firm established in 1850. Located in Alexandria, their activities include sub-surface mining, processing, packing, and selling of salt.

They export their products to the U.S., Canada, Western Europe, the United Arab Emirates, Saudi Arabia, Kuwait, Libya, North Yemen, South Yemen, Iraq, Sudan, Nigeria, Cameroon, and Sierra Leone. They rated their general profitability performance as "very good" on a scale of Low, Satisfactory, Good, and Very Good.

Their organizational development strategy involve several new projects including: (1) The Mirsa Matrouh project which involves plans for an aquafer mine for potacium salts, magnesium, etc. (2) Lake Fayoon -- the feasiability study has been completed and the project is now under implementation. This calls for the extraction of salt and a variety of other minerals from the Lake. This will cost over $100 million with Egyptian banks providing the funds and El Nasr providing the technology. (3) El Arish (in the Sinai) -- a solar saline plant to extract salt from Bardavil Lake. This is under implementation and will cost $30 million.

The technology used by the organization originated in ancient Egypt with methods that have been used for thousands of years. More

modern sources of technology are France and Italy.

No formal licensing agreements were used by the company. They copied public domain information and technology. Only minor adaptions were required in the imported technology. These changes were for the purpose of cost savings. The costs and difficulties in making these changes were minor.

R & D activities within the organization are significant according to the company. In addition to the central R & D group, each branch of the company has its own R & D staff. About 50 engineers and chemists are employed for design and experimental work.

All training for the staff is done after employees have joined the organization. They have trained more than 30 engineers, chemists, and foremen. None have been sent abroad for training.

Technology export activities of the company include providing technical assistance, turn-key plants, consulting, engineering and management services to Libya, North Yemen, South Yemen, Iraq, Nigeria, Sierra Leone and Cameroon. Some of these opportunities came about through the company's own initiative (in the case of Iraq and Saudi Arabia); some at the Egyptian government's request (in the case of Yemen and Libya); and others by the recipient firms' request (in the case of Cameroon, Sierra Leone, and Nigeria).

The motives behind El Nasr Salines Company's entering the technology export market were (in order of importance): (1) to exploit accumulated experience and know-how; (2) a request by the Egyptian

government; and (3) a request by the recipient firm. There was no difference in the export work in comparison with that done domestically. Minor adaptions were needed in order to mount the export project because each mine site has its own meteorological characteristics and source of feeding (sea, lake, mine, etc.) so changes must be made in equipment and processes.

El Nasr Salines Company's advantages over its competitors were the cost of its technology, the quality of its production, and its political, commercial, and cultural links to the countries to which it was exporting.

The company indicated it was at no disadvantage viz-a-viz its foreign competitors. It used no foreign collaborators in its projects.

The technology importers were private and state-owned entities. In Yemen, Iraq, and Libya, the importers were state-owned and in Cameroon, the importer was a state-owned company, but the project was implemented by a private company.

Foreign markets were first explored upon invitation. At that point, the company sent teams of experts to study the market. A few years ago, they sent teams in to study export and technology export markets. Now they are only trying to keep their share of the market. Information on potential customers was obtained through teams of investigators, government sources, and the chain of communication. Bids were put in according to the specifications of the client.

Financing was arranged through the government or private sector.

El Nasr Salines, itself, did not get involved in the financing negotiations. The company indicated that there were no major problems encountered in the technology export. The company does not get much profit from it's licensing agreements. It is usually in the form of royalty revenues where the company receives some licensing fee, the amount of which is insignificant.

Indirect financial earnings associated with the technology export was gained through the new experience gained at the new sites which could be applied domestically. For example, in the Cameroon project, the latest technology was implemented which was not even available in Egypt at that time, but now, they have been able to apply it in Egypt.

As of now, the company indicates it is too busy with the domestic market to plan any technology export plans for the future, until about 1987.

El Nasr Salines Company received help from the government promotions system in that the government calls upon them to enter into a venture. They have rated this help as decisive on a scale of Decisive, Important, and Non-important because the company enters into export ventures only on government orders. Financial reward is minimized as a decisive factor, as far as the company is concerned.

They have suggested that the promotional system might be improved through more information.

El Nasr Salines Company has asked UNIDO to use Port Said

Project (now a functioning solar salt processing plant) as a training center. The company expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis. The following table provides some basic information on the company.

TABLE 1. EL NASR SALINES COMPANY: Employment, Production and Exports 1975, 1979, and 1980

	Employment	Production			
Year		in U.S. $	in LE	in U.S. $	in LE
1975		5,110,200[1]	2,004,000	290,700[1]	114,000
1979		6,645,210[2]	4,647,000	622,050[2]	435,000
1980	1,540	9,395,100[2]	6,570,000	1,181,180[2]	826,000

Source: GOFI

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

CASE #9

EGYPTIAN IRON AND STEEL COMPANY

The Egyptian Iron and Steel Company is a very large publicly-owned company established in 1954, as a turn-key project by West Germany in what later became the Hilwan Industrial Estate, near Cairo. Its technological relationship switched in 1958 to the Soviet Union. During the subsequent years, it was promoted as a show-case of technology transfer from the Soviet Union. With policy changes in Egypt in the 1970s, and the severing of ties between Egypt and the Soviet Union, Hilwan Steel Mill complex switched to the West -- particularly West Germany, Great Britain, and the U.S. -- for technology.

Their activities include iron and steel production including small sections, medium section, and heavy sections; rolled products (hot- and cold-rolled); and cold-formed sections.

The company exports its products to Western Europe, Eastern Europe, Saudi Arabia, Kuwait, Jordan, and the Sudan. The Egyptian Iron and Steel Company has rated its general profitability performance as "low" until 1979 and good since then on a scale of Low, Satisfactory, Good, and Very Good.

The organizational development strategy for the company includes a modernization and expansion plan financed by the World Bank and West Germany. They plan to increase production to 1.6 million tons per year by 1984-85 and to 2.2 million tons by 1987.

Egypt's goal is to increase steel production to 15 million tons per year by the year 2000. The Egyptian Iron and Steel Company at Hilwan is pivotal in this plan. The role of the company in this expansion plan is two-fold: First, through modernization and other expansion methods, the company intends to increase its own production. Second, by participating in joint-ventures with other Egyptian and non-Egyptian firms, it plans to have an increasing role in the production of related steel products. One of these joint-ventures is with the Alexandria Steel Company for the production of reinforced steel bars, with a planned capacity of 750,000 tons per year. The other is with the Sadat Steel plant intended to produce flat plates.

The sources of technology originally exploited by the organization were from West Germany, the U.S.S.R., and Great Britain. The technology licensing arrangement was a turn-key project. The first part, from 1954-58, was with West Germany and the second part was with the Soviet Union with agreements running from 1961-64, 1964-67, and 1969-73. With policy changes in Egypt since 1974, the focus of technological reliance has switched to the West, as indicated earlier.

The changes which had to be made in the imported technology used in the sintering plant designs were minor, but that used for the steel-making converter and the sharp and continuous casting machines required significant changes. The motivations behind making changes in the imported technology were cost savings -- the

changes helped lessen the maintenance costs - and improved productivity. The costs and difficulties in making these improvements were minor in 30% of the cases and 70% of them involved significant costs and difficulties. For example, faultily designed units (which were causing under-production in some units) had to be redesigned. It cost the company $1 million to modify the units and to increase production. Also lost were profits caused by under-production in the two years it took to realize the problems with these Soviet-designed units.

The R & D activities engaged in by the Egyptian Iron and Steel Company are minor, according to The Company itself, if contrasted with similar plants in advanced industrial countries, but substantial by Egyptian standards. They have 67 technichians and engineers working in R & D and an additional 700 employees work in quality control and in the laboratories. The company holds approximately 27 patents in the fields of steel making, steel rolling, and refractory lining practices. Most of the company's training programs consist of the Tabina Institute for Higher Studies (where about 80 master's degree graduates are trained per year) and the Training Department of the company. Here course are given toward up-grading the existing workers and foremen as well as training programs for beginning workers. A total of about 500 persons are ' lved. In addition, up-grading courses are provided for about 2,000 workers per year.

The chairman of the board and the higher-level management received their training in many Western countries. Many other employees got master's degrees and Ph.D.'s either from West Germany, Great Britain, or the U.S.S.R.

Technology export is in the form of techincal assistance, requested by host governments, and labor supply in the form of company workers leaving for temporary employment abroad. Their contracts were with Somalia for technical assistance in preventive maintenance (4 persons); Syria for production control for a roller mill (4 persons); and a small contract with Morocco (4 persons).

The technical staff of the Egyptian Iron and Steel Company are spread throughout the Arab World, including the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Qatar, Jordan, Jordan, Iraq, Morocco, Libya, and Syria.

The company has rated its export work as less sophisticated than that done domestically. Only minor adaptions were required in order to conduct the export project.

The company's advantage over its international competitors were its political, commercial, and cultural links. For example, the Arab countries and Somalia specifically wanted Egyptians for the project. The company's disadvantages were its lack of experience in doing work abroad and in transfering technology abroad.

The technology importers were private entities (in the case of Morocco) and state-owned companies in most other cases. The relative sizes of the importers were both small (in the case of Morocco and Somolia) and medium. They were all in manufacturing. The technology export gave rise to subsequent economic collaboration in both production and technology development. Foreign customers first came to the company. Subsequently, their executives visited the potential customers in order to collect data and conduct negotiations. There was no formal bidding process. Estimates were given when requested.

Financing was arranged in several different ways. In Somalia, the export project was financed by UNIDO; in Morocco, the government of Morocco; in Syria, the Egyptian government; and in Saudi Arabia, by the government and private companies.

According to the company, the major problems encountered were housing, adjusting to life in places like Somalia, language (Somalia), local capabilities (Somalia), and the local trainees' willingness and ability to receive training.

In Syria, the company signed a licensing agreement in 1979 which provided for steel-rolling facilities. In Morocco, in 1974, a two-year contract provided them with a rolling path design for rolling mills. The technological feedback received for the export of technology is considered small in magnitude, according to the company. It also was unimportant to the company's market standing - both at home and abroad.

For the future, the Egyptian Iron and Steel Company plans to have management of maintenance system, to have a regional training center via UNIDO, and to have a computerized production control system and a data base for steel and basic industry.

The Egyptian Iron and Steel Company received help in the technology export project from the Egyptian government (the government acted as the sales and promotion office) and through UNIDO. Naturally, since the company is government-owned, the government's co-operation was essential to the success of the technology export.

They suggested that the promotional system could be improved with more information on a) the countries in need of the technology,

b) the types of technologies that could be provided by the company, and c) any possible financial aid available. (This could make it easier to render aid to customers with minimum costs to the recipients, according to company officials).

The company suggested that the international organizations might be used for the promotion of management systems in LDCs.

The Egyptian Iron and Steel Company expressed a willingness to cooperate with the UNIDO/INTIB system on a continuous basis.

Tables 1 and 2 below provide data on the Company's production, employment and exports.

TABLE 1

EGYPTIAN IRON AND STEEL COMPANY

Employment, Production, and Exports, 1970 and 1973-81

YEAR	EMPLOYMENT	PRODUCTION		EXPORTS	
		in U.S.$	in LE	in U.S.$	in LE
1970	9,830	NA	NA	NA	NA
1973	16,400	NA	NA	NA	NA
1974	19,200	NA	NA	NA	NA
1975	21,841	148,968,450[2]	58,419,000[1]	12,370,050[2]	4,851,000[1]
1976	23,559	NA	NA	NA	NA
1977	23,522	NA	NA	NA	NA
1978	23,252	NA	NA	NA	NA
1979	23,227	159,869,710[3]	111,797,000[1]	11,591,580[3]	8,106,000[1]
1980	24,668 26,090[1]	250,149,900[3]	174,930,000[1]	17,960,800[3]	12,560
1981	25,200	NA	NA	NA	NA

[1]GOFI data. Other figures provided by The Company.

[2]GOFI data converted at the official IMF exchange rate of $2.55 per LE.

[3]GOFI data converted at the official IMF exchange rate of $1.43 per LE.

TABLE 1

EGYPTIAN IRON AND STEEL COMPANY

Annual Steel Production (in tons) 1970 and 1973-81

YEAR	ANNUAL PRODUCTION (tons)
1970	234,000
1973	236,000
1974	229,000
1975	341,000
1976	429,000
1977	511,600
1978	515,800
1979	579,000
1980	758,000
1981	807,000

TABLE 3

THE EGYPTIAN IRON AND STEEL COMPANY

Exports 1970 and 1973-81

(in '000 monetary units)

Country	1970	1973	1974	1975	1976	1977	1978	1979	1980	80-81[2]
Western Europe[1]	N.A.	DM1,107	LE4,163	LE4,069	LE3,011	LE1,013	LE7,975	N.A.	LE7,004	LE7,229
U.S.S.R.	$3,086	LE3,350	N.A.	LE4,278	LE1,422	LE787	LE79	-	-	-
Other Eastern European Countries	$ 308	LE2,562	LE304	LE480	LE497	LE412	LE252	LE7,949	LE1,994	-
Saudi Arabia	-	LE317	LE1,263	LE301	LE150	-	-	-	LE1,200	-
Kuwait	-	-	-	-	-	-	-	-	-	-
Jordan	-	-	LE1,263	-	-	-	-	-	-	-
Sudan	-	-	-	-	-	-	-	LE1,400	LE800	-

[1]Austria, West Germany, U.K., Switzerland, Italy.

[2]Fiscal year.

N.A. = Not Available

Source: Information provided by the company.

CASE #10

MISR/MEHALLA SPINNING AND WEAVING COMPANY

The Misr/Mehalla Spinning and Weaving Company is a very large textile factory located in Mehalla Kobra, on the Nile Delta between Cairo and Alexandria. In 1980, it had nearly 32 thousand employees, LE 170 million in production, and LE 47.6 million in exports. Like many other textile and weaving companies, it uses Egypt's world-famous cotton to produce an array of fabrics and other material. Misr/Mehalla was the largest employer, the third largest producer (after Eastern Tobacco and Cigaretts Co. and Egyptian Iron and Steel Co.) and the second largest exporter (after Misr Aluminum) in 1980. Also, like many other textile factions, its machinery and technology come from many different countries. Changes were made in the imported technology in order to save money. The costs and difficulties in making these changes were minor, according to the company officials.

The company has no center which concentrates solely on R&D. The quality control center does some R & D work in addition to the separate departments which do their own R&D work. When needed, the center and the individual departments join forces to work on special R&D projects.

The top level management received both academic and short-term technical training abroad at the company's initiative. The short-term training included visits to fairs and exhibits around the world.

Most Ph.D.'s in the company received their degrees in Egypt.

The Compnay exported technology in the form of consulting, engineering, management services, technical assistance, in-plant training, and labor supply. The company contributed to labor supply by informal agreements to let their workers go abroad on their own without jeopordizing their jobs with Misr Spinning and Weaving Company.

Some technology export opportunities came about through the initiative of the Egyptian government.

The motives behind the Misr Spinning and Weaving Company's entering the technology export market were (in order of importance): (1) a request by the Egyptian government; (2) a request by the host country's government; (3) the private contractor's request; and (4) for diplomatic reasons.

Technical services were provided to companies in the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Qatar, Jordan, Iraq, the Sudan, and Morocco.

The company has rated the sophistication of the export work they do as having no difference with that done domestically.

They indicated that no changes were necessary in the existing technology before taking it abroad.

The main advantages that the company had over its foreign competitors were the political ties and cultural links with the countries to which it exported the technology. The company indicated

that it had no disadvantages viz-a-viz the foreign competitors and it used no foreign collaborators. Technology importers were both private companies and state-owned enterprises. Information on potential customers was obtained from GOFI, the General Organization for Industrialization, in the Ministry of Industry and Mineral Wealth. The most serious problem encountered through the technology export was the language barrier with the non-Arab trainees who were brought to Egypt.

There was no licensing fee charged for the technology exported other than the employees salaries.

The company indicated no indirect financial earnings were gained as a result of the technology export. In fact, sometimes the company created competition for itself by healping to start a textile plant which would subsequently take market share away from the Egyptian company.

No defined plan for technology exports in the future was indicated by Misr Spinning and Weaving Company. No promotional system exists for the company. They do export work by order of the government. They suggested that it would be better to have an organized system for the export of Egyptian know-how and industrial workers similar to the one which exists for teachers and some other labor. It needs to be systemized, as it is now haphazard, in their view. They also suggested that the international organizations might provide information on leading manufacturing firms. Also, that information on INTIB and the UN should be disceminated.

The following table provides some pertinent data on Misr/ Mehalla Spinning & Weaving Co.

TABLE: 1: Production, Exports, and Employment, 1975, 1979, 1980

	Employment	Production		Exports	
		in U.S.$	in LE	in U.S.$	in LE
1975	-	192,948,300[1]	75,666,000	42,314,700[1]	16,594,000
1979	-	212,203,420[2]	148,394,000	59,610,980[2]	41,686,000
1980	31,950	242,619,520[2]	169,664,000	68,142,360[2]	47,652,000

Source: GOFI

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

CASE #11

KAHIRA PHARMACEUTICALS AND CHEMICAL INDUSTRIES COMPANY

Kahira Pharmaceuticals is a large state-owned pharmaceutical plant established in 1962, and involved in the production of pharmaceuticals with a speciality in cosmetics and veterinary medicine. Some of the products are manufactured under license; others are The Company's own fabrications. Kahira Pharmaceuticals has a substantial and diverse export record. Its products are exported to the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Abu Dhabi, Oman, Qatar, Jordan, Iraq, the Sudan, Tunisia, Syria, and other Third World countries.

The Company produces a variety of pharmaceuticals under license from such multinationals as Abbot International Ltd. (U.S.A.); Boots Company Ltd. (England); Chemie Werk Homburg Pharmaceutical Div. (West Germany); Eaton Laboratories' Norwich International (U.S.A.); Eli Lilly (U.S.A.); Imperial Chemical Industries Company Ltd. (England); Lakeside Laboratories, Inc. (U.S.A.); Merck Sharp & Dohme (U.S.A.); Ravizza S.P.A. per L'Industria Chimica E Farmaceutica (Italy); G.D. Searle & Company Ltd. (England); and Smith, Kline & French Laboratories Ltd. (England).

The company is in technical cooperation with Asta-Werke Aktiengesellschaft Chemische Fabrik (West Germany) and Chemiewerk Homburg Pharmaceutical Division (West Germany).

The company's organizational development plan is to cover the

requirements of the local market and the governmental sector and to export the surplus. They also plan to do research for new products and acquire new technology through licensing agreements with international pharmaceutical companies.

Technology currently utilized by the company came either through local in-house R&D or training in foreign companies that were similar to Kahira. Other sources include licensing agreements with international companies for producing drugs which have a proprietary technology. The licensing fee consisted of a 5% royalty for 5 years. Kahira Pharmaceuticals found it unnecessary to change any of the technology which it imported.

The company has no R&D center. However, R&D is carried out in cooperation with other national research centers, a scientific committee of professors in different branches of medicine, a technical committee of professors in pharmaceutical industries, and team work of the company technicians. Nevertheless, the company rated the intensity of its R&D work as "above average". In the period of 1975-81, Kahira Pharmaceuticals applied for one patent abroad. The company provides its own sources of funding for R&D activities.

One of the interesting and rather unusual research activities in the last few years, according to the former chairman, has involved the pharmocognosy of medicinal plants, based on folk medicine. In the course of their research on the origins and toxicology

of plants, they were able to extract the active ingrediant of a native plant which -- as folklore has it -- was used to cure urinary problems. Labelled Proximol, it is now in the process of being patented by Kahira.

The company's top-level management received training and education both at the company's initiative and prior to joining the firm.

The most significant technology export by Kahira involved the exportation of technical assistance in connection with a pharmaceutical plant in Basra, Iraq, that had been started as part of an agreement between the Soviet Union and Iraq. The plant turned out to be unsatisfactory from the Iraqi's viewpoint in terms of practical utility. Kahira was brought in to provide the assistance needed to complete the plant. The arrangements for this project were made through Dr. Borhan, the chairman of the Board for Kahira Pharmaceuticals until December 1981. He assembled and headed a team of experts from Kahira Pharmaceuticals in 1970. They went to Iraq to complete the pharmaceutical plant, begun by the Russians but never completed. According to Dr. Borhan, many of the machines and processes had to be changed or modified to make the project operational and efficient. The company replaced Soviet machinery with Swiss, German and British machinery.

Kahira rated the sophistication of the export work as having no difference with that done domestically. In the Iraqi project,

only minor adaptations were needed in order to do the project. It merely involved the replacement of the Russian machines.

The advantages which Kahira had over its foreign competitors were the ability to easily communicate with the Iraqis, good political relations between the Iraqi and Egyptian governments, and their experience in the manufacturing of pharmaceuticals. Their main disadvantage was that there was no systematic method of operation and an appreciation for technical work by some of the Iraqi workers.

The Basra plant was a state-owned, large pharmaceutical manufacturing plant which was the first of its kind in Iraq. The Egyptian government provided some indirect assistance in the project. The company gave a license to the Basra plant for the duration of five years.

The reasons given for so little technology export was that the political relations between Egypt and the other Arab countries was severed as a result of the Camp David agreements which Egypt participated in. The Arab nations boycotted Egyptian companies and preferred looking to Europe. However, despite temporary difficulties, according to Dr. Borhan, former chairman of Kahira Pharmaceuticals, Third World technologies are most appropriate and responsive to the needs of other LDCs. However, he has encountered several problems as a consequence of his personal experience. One problem is that rich countries want the most up-to-date technology

and, "being too rich, ask for the moon." At the same time, neither their managers nor their domestic work force have the "technical mentality" which he considers as a prerequisite for successful technology transfer. Furthermore, Egypt's domestic pharmaceuticals market is growing at a rate of about 30% -- too fast to leave excess capacity, either in product or personnel, for foreign markets. And, finally, according to Dr. Borhan, Third World consumers tend to prefer the famous brand-name products of the multinationals while the multinationals make monopoly and protected full access to the entire market a precondition for entry.

The company expressed a willingness to cooperate with the UNIDO/INTIB system on an occasional basis. The following tables provide data on production, employment and exports by Kahira Pharmaceuticals.

TABLE 1: Employment and Production

Year	Employment	Production in U.S. $	in LE
1970	1,202	12,240,000[1]	4,800,000
1973	1,252	16,575,000[1]	6,500,000
1974	1,285	17,340,000[1]	6,800,000
1975	1,415	20,655,000[1]	8,100,000
1976	1,573	27,795,000[1]	10,900,000
1977	1,771	35,445,000[1]	13,900,000
1978	1,814	36,465,000[1]	14,300,000
1979	1,865	22,165,000[2]	15,500,000
1980	1,936	27,599,000[2]	19,300,000
1981	1,995	31,031,000[2]	21,700,000

Source: The Company.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

Table 2: Exports According to Country of Destination

Country	1970	1973	1974	1975	1976	1977	1978	1979
United Arab Emirates	-	216	6,201	39,340	-	9,382	11,656	34,581
Saudi Arabia	14,510	1,907	104,076	29,310	-	612,250	104,928	242,153
Kuwait	1,204	2,480	5,528	4,708	-	27,583	1,688	9,625
Bahrain, Abu Dabi and Oman	412	-	1,089	2,430	-	20,804	47,130	-
Qatar	668	6,039	9,705	8,067	-	21,675	31,670	3,346
Jordan	5,042	2,446	567	-	-	-	-	-
Iraq	25,481	4,843	1,750	17,717	-	1,820	11,795	144,725
Syria	-	3,370	292	7,731	-	-	-	-
Sudan	19,768	4,527	-	48,690	-	-	16,845	86,130
Tunisia	-	13,609	131,183	-	-	35,010	4,718	1,830
Rest of Africa	7,618	-	-	149,721	-	-	-	-
Rest of Third World	-	213	21,469	13,361	-	-	-	175

Source: The Company.

CASE #12

BUSINESS SERVICES INTERNATIONAL

Business Services International, a subsidiary of International Business Associates, is a private entity established in 1980.

International Business Associates is an American consulting firm which advises companies doing business in Egypt and the Sudan. IBA regularly advises on appropriate business strategies, conducts feasibility and marketing studies, and performs a variety of other consulting services. They also provide a multitude of administrative and logistical services to help expediate clients' business affairs.

The aim of this subsidiary is to provide a range of services to international firms operating in Egypt and elsewhere in the Middle East. Among these services, and of significance to our study of the export of technology, know-how and skilled manpower from Egypt, is BSI's work in recruiting high-level manpower in medical services --doctors, nurses and medical technicians -- for work in Saudi Arabia. BSI is thus one among the increasing number of "talent-hunters" which have emerged in the last decade to locate, screen and recruit skilled workers for work in the oil-rich countries of the Middle East.

Several pertinent points emerged in discussing the matter with BSI. First, both Saudi Arabia, the ultimate client and the American contractor supplying the hospital project, have high regards for the Egyptians. Second, clients are interested in qualified and well-

trained individuals. Those who have it will get the overseas assignment. Those without the necessary skills and qualifications will stay behind.

The third point deals with the differential in salary and compensation. The gap between what a medical doctor can make in Egypt and, say, Saudi Arabia, is phenomenal. A graduating general practitioner starts at LE35 per month (about $50 at the offical exchange rate, but $35 at the market rate), and can reach a high of LE 200/month in private practice. A similar person, with two years of experience (something many employers in labor-absorbing countries of the Middle East insist upon) will start out at $2,500/month plus lodging, subsidized food and other fringe benefits in Saudi Arabia. If cost of living adjustments are made, this salary would seem less awesome. But it would still be well over five or six times that of Egypt.

CASE # 13

General Organization for Government Printing Offices

The General Organization for Government Printing Offices (GOGPO) was established in 1820. Its main activity is printing. It prints the overwhelming portion of the Egyptian Government's material.

The company has a five-year plan in which it intends to replace the old equipment with new, modern equipment.

The top management of the organization received some education and training at the company's initiative.

The technology export by GOGPO is in the form of training foreign workers at its Cairo plant. The opportunities have come about through the company's initiative and through the recipient firms' initiative.

The motives behind GOGPO's desire to enter the technology export market and its past involvement in training non-Egyptians have been the existence of excess capacity, and in order to exploit their accumulated experience and know-how.

This training has been provided in the past to workers from Saudi Arabia, Kuwait, Qatar, Jordan, Iraq, the Sudan, and Libya. In the past, they had 50-80 trainees per year from each of these countries. At the present time, they have a total of 20 trainees from abroad.

The technology importers (i.e., client firms whose employees receive training at GOGPO) are small, state-owned companies. Occasionally this involvement has given rise to subsequent economic collaboration in production and technology development.

The reasons the company has had so little technology export so far is due to its lack of relevent technologies and the lack of relevent human and financial resources.

The company's technology suppliers (the United Kingdom and West Germany) have provided training courses for GOGPO employees.

They suggested that the promotional system could be improved by more information and financial aid. Also, they suggested that one role of the international organizations might be to provide training. Another, according to GOGPO, would be to provide technical and financial assistance.

The company expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis by making its facilities and personnel available to conduct training in printing technology to non-Egyptians, especially Arabs.

The following table shows employment and production data for various years.

Table 1

Employment and Production, 1970 and 1973-81

Year	Employment	Production in U.S.$	Production in LE
1970	3,150	2,650,000	1,033,500[1]
....	.....	.....	.....
1973	3,400	3,253,000	1,268,670[1]
1974	3,400	4,300,000	1,677,000[1]
1975	3,400	5,600,000	2,184,000[1]
1976	3,200	7,800,000	3,042,000[1]
1977	3,400	9,000,000	3,510,000[1]
1978	3,300	10,000,000	3,900,000[1]
1979	3,100	10,000,000	7,000,000[2]
1980	3,750	9,300,000	6,510,000[2]
1981	3,500	9,300,000	6,510,000[2]

Source: Information provided by the company.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

CASE #14

The Egyptian Mechanical Precision Industrial Company (SABI)

Established in 1960, SABI is a relatively small, state-owned company which produces hinges, locks, padlocks, zipper fasteners, files, and bathroom fixtures. They also produce construction-related materials, abrasives, carbide tips, light fixtures, bottle-caps, and automotive parts (such as spark plugs) among other things.

The company's products are exported to Saudi Arabia, Lebanon, Iraq, Libya, and the Sudan. Exports have declined in the last few years due to the increased demand by the local market.

Several additional expansion projects as part of their 1982-87 five-year plan in their two plants (one is near Cairo; the other, near Abbasiyah) include new sandpaper and abrasives which will add LE 12 million in new production; new hinges which will add LE 3.1 million per year; as well as the development plant for carbide tips which will add another LE 2.4 million in new production. They produce about 50 products, each of which has its own laboratory. They hope to gain additional technology from the following sources: For bathroom fixtures, they plan to obtain the technology from the Oderle Company (a French company); that for carbide tips from England; and other technologies from Italy.

The sources of technology originally exploited were from Italy, England, France, Czeckoslovakia (the Skoda Company), East Germany, and the U.S.S.R.

One of their licensing agreements called for a contract which gave the technology exporter 2% of SABI's net sales for the products to which that technology applied for the first five years of production, to go down to 1½% for a limited number of years thereafter.

Significant changes were made by the company in the imported technology. For example, the spark plugs were altered to meet local needs and the bathroom fixtures were changed to meet local needs and according to input material availability. The motivations behind these changes were thus to adapt the technology to local market needs and in order to substitute new materials. The costs and difficulties in making these improvements were minor, according to the company, involving only the modification of a few jigs and fixtures.

R&D activity within the organization is decentralized and done according to the needs of each specific division. However, some work is done through a centralized R&D center. For example, they have developed glue and resins which are used for abrasive materials (non-technical abrasives). They are currently trying to generate the technology required for technical abrasives.

SABI has rated its R&D activity as "average" for Egyptian

companies. The company has an R&D staff of 50 persons. On record, 2% of the company's annual budget goes toward R&D activity, but in reality, less than this is actually spent on R&D. This funding is the sole source of income for the company's R&D activity.

Company mangement received training and work experience both at the company's initiative and in connection with a foreign partner.

The motives behind the company entering the training market were (in order of importance): (1) Corporate policies; (2) A request by the host government; (3) A request by the Egyptian government; and (4) The offer of government subsidies.

The company's technology export is limited to providing technical training, free of charge, to trainees from Holland (one trainee, in 1979), Jordan (two trainess, in 1981), and Tunisia (two trainees, in 1980).

The advantages that the company had over its foreign competitors were the political, commercial and cultural links which it shared with the countries for which it was providing training. It shared a common language with both Tunisia and Jordan, as well as the notion of "Arab Unity".

The company explained that the reasons they had no other technology exports so far was due to a lack of interest on SABI's part in entering this field of activity and also the fact that

they lack the relevent technologies.

The company expressed a willingness to co-operate with the UNIDO/INTIB system on an occasional basis to tap the system's resources for its data on SABI's employment, production and exports.

Table 1

Employment, Production, and Exports by SABI, 1970 and 1973-81

Year	Employment	Production		Exports	
		in U.S.$	in LE	in U.S.$	in LE
1970	1,565	3,067,650[1]	1,203,000		
1973	1,559	5,528,400[1]	2,168,000		
1974	1,658	6,510,150[1]	2,553,000		
1975	1,770	7,754,550[1] 7,910,100[3]	3,041,000 3,102,000[2]	242,000[3]	95,000[2]
1976	1,912	8,231,400[1]	3,228,000		
1977	1,910	11,291,400[1]	4,428,000		
1978	2,002	12,558,750[1]	4,925,000		
1979	2,075	8,388,380[4] 8,688,680[5]	5,866,000 6,076,000[2]	243,000[5]	170,000[2]
1980	2,152 2,090[2]	11,794,640[4] 11,061,050[5]	8,248,000 7,735,000[2]	60,060[5]	42,000[2]
1981	2,127	13,367,640[4]	9,348,000		

[1]Provided by the company and converted at the official IMF exchange rate of $2.55 per LE.

[2]GOFI data.

[3]GOFI data converted at the official IMF exchange rate of $2.55 per LE.

[4]Converted at the official IMF exchange rate of $1.43 per LE.

[5]GOFI data converted at the official IMF exchange rate of $1.43 per LE.

CASE #15

The Egyptian International Centre for Agriculture (EICA)

The Egyptian International Centre for Agriculture was established in 1965 by the Ministry of Agriculture for the purpose of promoting the exchange of agricultural technology between Egypt and other developing countries.

The Centre has its own premises within the compound of the Ministry of Agriculture; most of the Ministry's research institutes are thus accessible to the participants. The Centre's facilities include a conference hall, lecture rooms, a library, a cafeteria, and a garden for the convenience of the Centre's staff and participants.

The Centre conducts four courses annually, each for a period of five months. These courses are taught in English, French and Spanish; simultaneous interpretation is provided.

The courses are designed to cover both theoretical and practical aspects of agriculture with reference to Egyptain experience in the field. The theoretical part of each course comprises almost a third of the training. Practial work makes up the remainder of each course, including laboratory work; case studies, seminars, field trips, and study tours.

Arrangements can be made for participants to meet senior officials and university faculty members for consultation on matters of special interest to them or their countries, and to

become acquainted with Egyptian techniques. There is a great opportunity for interchanging the experiences of various countries in the field of agriculture.

The Centre publishes the lectures delivered at each course in English, French and Spanish. These lectures are distributed to the trainees at the beginning of each course, to serve as references for the subjects under study.

The following courses are conducted at the Centre: plant production and protection (dealing with plant production, soil management, field crops, horticultural crops, food processing, insects, diseases and their control, agricultural quarantine, and phytosanitary measures); animal production and animal health (dealing with breeding and management of cattle, buffalo, poultry and sheep, animal physiology, the milk industry and animal climatology, nutritional deficiencies, parasitology sexual health control, slaughterhouse management and veterinary quarantine); agricultural services (including agricultural extension and community development, agricultural cooperatives, and agricultural credit, and agricultural economics and statistics); and land and water development (dealing with land development including fundamentals of soil science; planning and design of land reclamation projects; improvement and management of newly reclaimed lands with tropical and subtropical soils; utilization and development of reclaimed lands, including cropping patterns and crop rotation; and community development and settlement

programs, as well as the use of water resources for irrigation, irrigation methods and practices, water requirements, water conservation and use, planning and design of irrigation and drainage projects, and operation and maintenance of draining systems).

The EICA conducts more than ten different joint courses with international organizations annually, in order to share its information and experience in various aspects of agriculture with holders of fellowships granted by the international organizations. To date, such joint training agreements have been concluded with the Food and Agricultural Organization, Organization of African Unity, The Organization of American States, and AARRO. Courses are under way in cooperation with the ILO, UNESCO, and other organizations.

In accordance with specific training needs of various countries, the Centre conducts special training programs of varying durations in a number of fields relating to rural development and agricultural production.

The courses offered at the Centre are designed for junior and mid-career agriculturalists, specialists and administrators of agricultural projects, up to 40 years of age, with at least three years of appropriate experience in the field covered by the course.

Between 1965 and 1981, The Centre had trained 30 Egyptians and 2,285 trainees from other countries. Most of these countries are in Africa: Algeria, Benin, Botswana, Burvndi, Cameroun, Central Africa, Chad, Congo, Eqvatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea,

Guinea Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Niger, Nieria, Rwanda, Sao tome and Principe, Senegal, Sierra Leone, Somalia, the Sudan, Swaziland, Tanzania, Togo, Uganda, Upper Volta, Zaire, and Zambia for a total of 1,671 trainees from these 41 countries and territories. There were also 612 trainees from the following 21 Asian and Middle Eastern countries: Afghanistan, Bengladesh, Burma, Cambodia, India, Indonesia, Iran, Iraq, Japan, Jordan, Malaysia, Malta, Nepal, New Zealand, Pakistan, the Philippines, South Korea, Sri Lanka, Syria, Thailand and the Yemens.

Eight Latin American countries of Bolivia, Columbia, Ecuador, El Salvador, Guatemala, Honduras,Panama and Peru sent a total of 32 trainess during the 1965-81 period, to be trained in one of the four courses (animal production and health, plant production and protection, agricultural services, and land and water development, at The Centre.

Table 1 provides an annual and regional breakdown of trainees by major countries in the period of 1965-81.

TABLE I

THE EGYPTIAN INTERNATIONAL CENTRE FOR AGRICULTURE (EICA)

PARTICIPANTS IN THE REGULAR TRAINING COURSES, 1965-81

COUNTRY	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Total
Algeria	6	5	3	1				3										18
Egypt																10	20	30
Ghana	8	8	7	8		8	8	8	8	9	17	12	11	7	8	8	8	143
Libya	5	3	5	2		3	8	5										31
Nigeria	7	7	7	2		10	12	7	10	8	1	9	7		2			89
Sudan	8	2	5	5	28		18	9										75
Tanzania	5	3	7	5	8	14	11	5	2	3		2	3	10	8	8	8	102
Uganda	2	2	6	3	6	13	11	5	4		2	1	3	4	4	1		67
Zaire		3	15	10	7	8	1	3	3	6	2	4	8	8	8	4	2	92
Other African Countries[1]	50	57	41	55	23	75	79	66	65	86	79	57	70	59	61	110	60	1,093
Afganistan	4	6	4	5	6	10	8	4	4	5	10		9	9	6			90
India	1	4	2	3	2	1	2		2	3	3		3	6	4	1		27

...Continued

TABLE I

THE EGYPTIAN INTERNATIONAL CENTRE FOR AGRICULTURE (EICA)

PARTICIPANTS IN THE REGULAR TRAINING COURSES, 1965-81

COUNTRY	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Total
Indonesia	3	2	4	4	2	1	3	3	3	4	4		6	2	3	2	3	49
Iran	3	2	5	4				1	1	2	1		2	4				25
Iraq	3	3	2	4	6	17	5	1										43
Jordan	3	1	2	3	1	2	3	2										17
Pakistan	4	2	5				1	2	1	7	11	6	3	1			1	44
Philippines	2	5	2	1		7	6	6	7	8	7	8	17	21	11	17	16	141
Syria	2	2				1	2											7
South Yemen	4	3			1			4			1	1						14
Other Asian Countries[2]	10	8	6	4	7	2	6	3	4	7	3	7	14	14	17	19	10	141
Latin America[3]			4						4	6				3	2	2	11	32
Total Number of Trainees	131	128	53	116	97	172	183	139	118	152	141	107	156	148	134	121	139	2,315

Notes

1. Benin, Botswann, Burvndi, Cameroun, Central Africa, Chad, Congo, Eqvatorial Guinea, Ethiopia, Gabon, Guinea, Guinea Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagasca, Malawi, Mali, Mauritania, Niger, Nwarda, Sao Tome and Principe, Sengal, Sierra Leone, Somalia, Swaziland, Togo, Upper Volta, and Zambia.
2. Bengladesh, Burma, Cambodia, Japan, Malaysia, Malta, Nepal, New Zealand, South Korea, Sri Lanka, and Thailand.
3. Bolivia, Colombia, Ecuador, El Savador, Guatemala, Honduras, Panama, and Peru.

CASE #16

Delta Consultants, Ltd. Inc.

Established in 1975, Delta is a small, private consulting firm headed by an American-educated Egyptian who is also a Cairo University professor. The company provides "management and social consulting" to Egyptian and foreign clients in and out of Egypt. Its personnel has grown from 3 at the start to 23 in 1981. That year, it had an annual turn-over of about a quarter of a million dollars.

The technology export opportunity for Delta Consultants came in the form of a management consulting project which they performed at the request of the government of Saudi Arabia during 1978-79. Their motives for entering that market, in order of importance, included: 1) A request by the host country government; 2) Corporate policies; and 3) To exploit accumulated experience and know-how. The total cost of the project was about $150,000-160,000. Delta had foreign collaboration from an American counterpart. This combination, according to Delta, was very important in their getting the job. Being Arab proved to be an asset in establishing rapport and in the ease of communication, while the presense of the Americans lent additional credence. They noted that the quality of their service, as well as inter-Arab cultural links constituted advantages which they had over their international

competitors.

In mounting this project in Saudi Arabia, Delta combined techniques used in the U.S. and U.K., as well as the Korean model, in order to put forth a project that would fit Saudi Arabia's unique characteristics. The initial client was a governmental ministry and the work led to two subsequent consulting projects.

Delta was contacted first by the ministry. Delta then wrote the proposal, jointly with their American partner and in consultation with the client. The ministry also sponsored them, to ease the entry and research in Saudi Arabia. Final reports were written in English and Arabic.

Delta believes that this technology export experience was relatively "unimportant" as far as the company's market standing at home is concerned. But it is "somewhat important" for their market standing abroad. They intend to continue the same type of management consulting in the future, but to extend their domain of activities to other Middle Eastern countries. They also intend to extend their collaborative work with Western consulting firms such as Price Waterhouse.

The company put forth the following suggestions for the improvement of the promotional system for the export of technology, know-how and skilled manpower from Egypt: First, the government should act as agent and promoter, and introduce the types of services that companies such as Delta can perform throughout the Arab World. Second, there is a need to streamline and create

proper channels and mechanisms for the flow of this type of service similar to the system which has been at work at the Ministry of Health (for the outflow of health and medical professionals) and the Ministry of Education (for the outflow of teachers and educators).

Delta indicated their willingness to cooperate with INTIB on an occasional basis.

CASE # 17

ELECTRO-CABLE EGYPT

Established in 1956 and nationalized in 1961, Electro-Cable Egypt is another public sector company operating under the Ministry of Industry's General Organization for Industrialization. It makes electrical cables and wires for telephones, electricity, and other industrial uses with the original technology for production imported from Western Europe (primarily from West Germany). Due to rapidly expanding domestic market, the company has found itself pre-occupied with supplying the Egyptian market, while expanding its exports as well.

The technology exports of Electro-Cable Egypt is through its present and former employees in the form of consulting, management services, technical assistance, and labor supply. Most of these technical employees are or have been in Saudi Arabia and Libya.

In 1971, Mr. Hosni, the previous Chairman of Electro-Cable (until 1975), took with him several Electro-Cable employees to Saudi Arabia to work on a cable manufacturing project, where they worked until 1973. Also, from 1971-1973, employees of Electro-Cable Egypt built an electro-cable company in Libya. The experts stayed there until 1975 to supervise the work.

While company employees have worked abroad, Electro-Cable Egypt itself has no technology export. They cite as reasons for this their inability to fight eventual competitors, a lack of relevent technologies,

a lack of adequate human and financial resources, global concentration in the electrical industry, and the fact that they lack the critical minimum size for technology export. The following table shows data on employment, production and export.

Electro-Cable Egypt: Employment, Production and Export

	1975	1979	1980	1981
Employment	NA	NA	3,100[1]	3,000[4]
Production				
in LE	20,200,000[1]	37,449,000[1]	46,856,000[1]	42,000,000[3]
in U.S.$	51,510,000[2]	53,552,070[3]	67,004,080[3]	60,000,000[4]
Exports				
in LE	139,000[1]	3,433,000[1]	3,590,000[1]	NA
in U.S.$	354,450[2]	4,900,190[3]	5,133,700[3]	NA

[1]Provided by GOFI

[2]Converted at $2.55 per LE (IMF rates)

[3]Converted at $1.43 per LE (IMF rates)

[4]Provided by Questionnaire

NA = Not Available

Case #18

The Arab Contractors - Osman Ahmed Osman & Co. (Al-Moghaweloon Al-Arab)

Established as a private company in 1951 by an Egyptian entrepreneaur named Osman Ahmed Osman, this is a very large diversified company, with an annual turnover of some half billion dollars and a work force of 40 to 44 thousand. Its main activity is construction of all types, including construction of residential and commercial buildings, highways, bridges, underground tunnels, dams, airports and harbors. Its other activities include agricultural projects (such as irrigation, land reclamation and water desallination) and related industries such as tractor assembly (from Deutzof West Germany), as well as construction-related industries such as cranes, steel constructs and scaffoldings. Arab Contractors is also involved in a variety of other activities such as food production, tourism and hotel services, aluminum products (with Reynolds Aluminum of the U.S.), banking and insurance, manufacturing of switchgear and other electrical products, barges, and a medical center. It has joint ventures with private sector and affiliated companies abroad. See Table 1.

Osman Ahmed Osman's domestic operations were nationalized in the wave of nationalizations under President Nasser in 1961. However, Mr. Osman was permitted to remain the "Life Honorary Chairman" of the nationalized company which would operate under

the Ministry of Housing and Reconstruction. Because of its unique situation, it has been allowed to operate as an autonomous entity, with less interference in its affairs than has been the norm with other nationalized firms. In addition, Mr. Osman himself has been allowed to maintain foreign investments and other operations outside of the confines of the Arab Contractors.

The company's origins are traceable to Mr. Osman's construction activities outside Egypt, notably Saudi Arabia, and the repatriation of these earnings into Egypt in the 1950s when The Osman Ahmed Osman Company was selected as Aswan High Dam's domestic contractor (their bid was LE 16 million, compared to the others' 30-35 million). Using Soviet technical and financial assistance, Osman successfully completed that edifice and, in time, picked up additional tasks in rapid succession.

Today, the Arab Contractors (Moghaweloon Al-Arab) is highly visible in many of Egypt's cities and construction sites. It is also active as a successful Third World multinational in several Arab countries.

According to the group consolidated balance sheet in its 1979 annual report, the Company had total assets of LE 418 million in 1978 and LE 537 million in 1979. The same annual report (the latest available in May of 1982) shows earned revenues at LE 219 million in 1978 and LE 360 million in 1979. Elsewhere in the report, the following figures are given for "earned revenue"

(figures in thousands of Egyptian pounds):

1979	1978	1977	1976	1975
300,835	215,665	154,043	124,870	96,430

The organizational development strategy of the Company includes 1) separating the company into autonomous profit centers, 2) going into new markets (such as Oman), 3) concentrating on manufacturing the products they need in their construction projects (such as ceramics, scaffoldings, door and window making, etc.), 4) applied research, and 5) modernization of old plants.

The Arab Contractors uses Western technology from a variety of sources. In their construction of the Ahmad Hamdi Tunnel beneath the Suez Canal, for instance, they used some British technology under an arrangement with Termac Company of the U.K. In their manufacturing activities they use West German (Deutz) and Swiss (Brown Boveri) technology, and in aluminum activities, they use Reynolds Aluminum (U.S.) technology. These technologies are used with minor modifications.

The company does not have an organized R & D center or well-defined projects, although many of their activities entail adaptation and applied engineering work. They estimated that 3 to 4 hundred individuals may be engaged in some form of R & D, including some 25 engineers in the Department of Technical Studies. On the whole, the R & D level of the Company is low relative to its size and scope of operations.

Many of the top level managers of Arab Contractors have had some form of training abroad, either prior to joining the company or while at the firm. Some of these have been in conjunction with foreign partners with whom Osman A. Osman Company has worked as partners.

The export of technology, know-how and skilled manpower by The Arab Contractors is rather extensive, and is in the form of consulting and engineering services, turnkey operations, and (by Mr. Osman himself and outside the domain of The Company) foreign direct investments. Activities of the Company are spread throughout the following countries: Saudi Arabia, Kuwait, Iraq, Libya, Jordan, the Sudan, and Oman. The company noted that there was no difference in sophistication of export work compared to domestic work, commenting further that their domestic construction activities are also capital-intensive as the emigration of construction workers (semi-skilled as well as skilled) to other Arab countries drives up the cost of labor. They said, for instance, that an unskilled construction worker commands LE5 per day whereas the cost 5-6 years ago used to be LE.50 to LE.70.

Among the advantages mentioned by The Company over its international competitors, The Arab Contractors emphasized their cost advantage as well as commercial and cultural ties between Egypt and other Arab countries. It was said that commercial, technical and economic relationships of The Company have continued with those

countries despite post-Camp David political problems. The Company mentioned its inability to compete in non-technical aspects (i.e., support services) as a disadvantage over other foreign firms in third markets.

Foreign clients of the Arab Contractors have included private as well as state-owned and joint venture firms. Most are unusually big, and some are public utility or other governmental projects.

Foreign markets were first explored often at the personal initiative of the honorary chairman Mr. Osman A. Osman. Subsequently, tenders were placed by the Company in the usual way. The company sometimes responds to international tenders; other times it is invited to bid. It often finds its foreign collaboratoes prior to bidding.

Sometimes, Western multinational contractors seek them as partners (an example is Brown and Root).

Although most financing is arranged by the client, Arab Contractors has at times helped arrange financing -- in rare occasions from the Ministry of Housing and Reconstruction, under whose jurisdiction they operate.

Among the major problems encountered by the company in its international work has been following the timetable. They believe also that familiarity with the socio-cultural environment is a key ingredient of success. They pointed out that scheduling delays and other problems have surfaced as a result of their third-country

partners' lack of familiarity with the environment.

There have been some indirect financial benefits from the Company's foreign involvement in the form of a) foreign currency and b) learning and adaptation due to accumulated experience.

The company considers the export of technology to be "unimportant" with respect to their market standing at home (they are already the biggest and most visible contractor in Egypt); but they consider it "very important" to their market standing abroad.

They did not receive any financial help from the Egyptian government in their overseas activities. And they said that the promotional system to encourage the outflow of Egyptian technology and know-how was non-existent, suggesting that both financial assistance and information is needed.

As for a possible role for international agencies, they suggested that these organizations should advertise and propogate information about Osman A. Osman and similar Third World companies. The company is ready to cooperate with the UNIDO/INTIB system on a continuing basis.

Table 1 below contains a list of companies in which Arab Contractors or its holding company Arab Contractors Investment Co. or The Arab Contractors Employees Fund (The employee's pension fund) have equity. In addition to companies in Table 1, Arab Contractors has the following subsidiaries:

1. Arab Contractors Investment Company -- Ain Shams Housing Project.

2. Arab Complex for Wooden Products -- factory for wooden windows and doors.

3. Arab Contractors for Electrical Industries -- low and medium-range electrical equipment.

4. Arabian Company for Assembly and Manufacturing Construction Equipment -- conveyer belts assembly.

5. Arab Contractors Medical Centre -- 350-bed medical center.

Table 1: Affiliated Companies of Arab Contractors

Name of company and activity	Capital LE,000	Percentage share in total Equity			Total Share
		Arab Contractors	Arab Contractors Investment	Arab Contractors Employees Fund	
		%	%	%	%
Arab Contractors Investment Co.	12,000	95		5	100
Arabian Co. for Assembly and Manufacturing Construction Equipment	300	70	15	15	100
Arab Contractors Medical Center	7,000	95		5	100
Industrial Engineering Co. for Construction and Development	3,000			100	100
Misr Co. for Soft Drinks and Food Preservation	5,300		6	66	72
The Middles East Co. for Land Reclamation and Development of Agriculture and Live Stock Industries	2,300			91.3	91.3
Misr Consultant Engineers	35			86	86
Misr Irani Contracting Co.	1,500		75		75
Arab Contractors for Electrical Industries	1,500	70			70
The 10th of Ramadan Construction Co.	3,750		60		60
Arab Complex for Wooden Products	2,500	56			56
The Egyptian Co. for Aluminium Products	2,240		20	32.5	52.5
Suez Canal Insurance Co.	2,000			54.7	54.7
Acrow Misr Metallic Scaffolding and Formwork	1,500		16.6	33.4	50
Pyramid Vacation Village	10,000		50		50
Dynarab Contracting Co.	360,000		40	10	50
Ismailia Co. for Fish Farms and Fishing Industries	3,000		20.9		20.9
Ismailia Modern Slaughter House	2,000		10	10	20
Misr Reconstruction Co.	60,000	13.3			13.3
Misr-Aswan Co. for Fishing and Fishing Industries	9,000	11.6			11.6
Ismailia Clay Brick and Building Material	1,000		10		10
Ismailia Co. for Transport	4,700		8.8		8.8
Societe Arab International Des Banques	7,000		8.33		8.33
National Bank for Development	50,000	8			8
Ismailia Co. for Tourism	7,000	7.1			7.1
Arab International Consultant	2,100	6.7			6.7
Suez Canal Bank	10,000			5.5	5.5
Ismailia Co. for Refrigeration	1,000			5	5
El Mohandes Insurance Co.	2,000		5		5
Ismailia Co. for Poultry	3,000			1.6	1.6
Ismailia Co. for Agriculture Development	4,000			1.25	1.25
Consortia					
Osmac – Ahmed Hamdy Tunnel Project (Joint Venture Arab Contractors – Tarmac)		50			50
Airport Hotel (Joint Venture Arab Contractors – Fougerolle)		50			50
New Deep Water Quays & Dredging of Alexandria Harbour (Joint Venture Arab Contractors – Adriaah Volker)		50			50
Companies under formation					
Arab Contractors Printer	1,300				
Pepsi Agriculture Development Co.	3,400				
Ismailia Deutz Co.	10,000				

CASE #19

NASR BOILER COMPANY

The Nasr Boiler Company is a small public-sector company established in 1962 which makes boilers and pressure valves. It has about 900 employees and its annual production in 1982 is estimated at LE 4 million. In 1981, the company exported 2 boilers to the Sudan. Their level of technology export is rather minimal. Their organizational development strategy involves plans to re-activate their joint-venture with a West German firm (Steinmuller), for the manufacture of water pollution systems, etc. The Nasr Boiler Company will hold 51% of equity and Steinmuller will hold 49%,

The source of technology now utilized by the company is Bonjard (another West German company). The license was for technical assistance for the manufacture of boilers. The fee was based on a per-unit basis over a period of ten years. The company found it unnecessary to make any changes in the imported technology.

The company has no R&D center other than its laboratory. They have rated their own R&D activity as "low" on a scale of Low, Average, Satisfactory, and Above Average. Their current R&D staff consists of 8-9 employees and the R&D activities are alloted no special budget. The entire funding of the R&D work done is supplied by the company.

The top-level management of the organization was educated and trained both at the initiative of the company and in connection with

a foreign partner (1-2 at the beginning).

The reason they gave for their lack of exported technology was a lack of relevant technologies. For export purposes, water-tube boiler technology is needed to be utilized. However, at the present time, the company uses fire-tube technology, which is not suitable for export markets.

The company offered to accept trainees from abroad, but they also indicated that they also needed to send their personnel abroad in order to obtain the latest technology.

The company expressed a willingness to co-operate with the UNIDO/INTIB system on a continuous basis. Following are some figures on production and employment for various years.

TABLE 1: Productions and Employment

Year	Employment	Production	
		in U.S. $	in LE
1975	--	6,499,950[1]	2,549,000
1979	--	1,808,950[2]	1,265,000
1980	907	2,319,460[2]	1,622,000
1981	--	3,432,000[2]	2,400,000
1982	--	5,720,000[2]	4,000,000

Source: GCFI for 1975, 1979 and 1980, the Company for 1981 and 1982.

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

CASE #20

CENTER FOR PLANNING AND ARCHITECTURAL STUDIES

The Center for Planning and Architectural Studies is a private entity established in 1980. It was established by a well-known architect with prior work experience in the Arab World. Its services include architectural planning and training courses in architectural planning. They also publish a monthly specialized magazine[1] and architectural planning books. Also, they participate in a joint academic program for graduate level courses with the Pratt Institute in New York. The Center provides architectural as well as training services to Egypt, Saudi Arabia, and other Arab countries.

The Center's main theme is to "originalize" and indigenize architecture throughout the Middle East. They believe too many Western-educated architects ignore the unique characteristics of the local conditions, tradition, and culture. They are making their Center available for training by other Arab countries. So far they have had trainees from the Sudan, Bahrain, OMan, and Saudi Arabia. In addition they are extending their consultation function to other parts of the Arab World, primarily to the United Arab Emirates. They hope to position themselves rather well, (being confident and committed in their approach) to reap some benefits from "the Arab building boom".

The basic motives behind changes in the conventional Western technology of architecture by the Center were to adapt the technology

to local market requirements and to indigenize. The costs and difficulties in making the improvements were minor.

The teaching and library staff are engaged in R&D activities. When asked about the intensiveness of their R&D works, the Center was uncertain of how to define their activities, which consists of mostly preparing manuals and planning architecture. The Center is fairly new, and its management had received training abroad prior to the establishment of the Center.

Technology export came about as a result of three different things: the Center's initiative, the host government's request, and the recipient firm's request. Their motivations for entering the export market were (in order of importance): (1) To exploit their accumulated experience and know-how; (2) because of a request by the host country government; and (3) because higher profits could be gained abroad than domestically.

The technology which they exported to the United Arab Emirates, Saudi Arabia, Kuwait, Qatar, and the Sudan, was in the form of consulting, engineering, management services and training. On at least one occasion, the Center's export consisted of providing sculptures for a public structure in Jedda, Saudi Arabia, at a cost of SD 1 mill. (approx. $300,000).

The Center rated the work which they did abroad as more sophisticated than that done domestically. The reason they gave for this situation was international competition with other firms.

Additional R&D work was necessary in order to provide their services to the export market. For example, a project they did in Jiddah required additional research on local architecture.

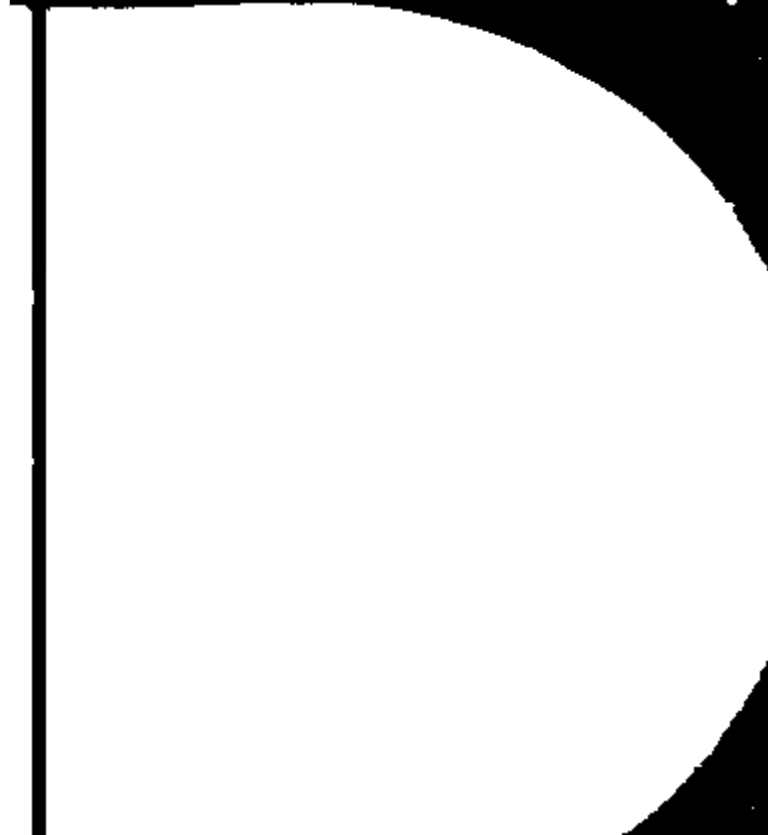
The Center's advantages over its foreign competitors were the cost of their services, (the Center was willing to do jobs considered too small to bother with by American and European companies,) the cultural links which they as an Egyptian company shared with their Middle Eastern customers, and their experience with dealing with the foreign buyers and dealing with the local conditions.

Their disadvantages had to do with marketing and with national image. They could not offer as elaborate a presentation as their Western competitors. Those larger firms could both out-bid and out-spend them. Also, the level and quality of work associated with national origin (i.e., American and European companies have a reputation for higher quality products and services) tended to be a disadvantage.

Technology was exported both to private- and state-owned companies that tended to be relatively small in size. Their services were offered to national governments and consulting and engineering companies. Initial dealings with their customers resulted in further training and follow-up work.

Foreign markets were first explored by the president of the Center who lived in both Saudi Arabia and Kuwait as a UN official.

The Center chose its foreign collaborators from among the many



firms which it knows in various countries. The collaborative agreements were of short duration. They only lasted until the specific job for which the contract was made was finished. Financing was arranged by local partners who had contact with the various ministries.

The major problem encountered was the lack of equal representation in settlement of disputes. Even in countries in which Egypt had an Embassy, the company felt they were not given the same support by their embassy which American and British companies tend to get from their embassies.

Indirect financial earnings due to the technology export were in the form of additional students to their training center and the services which they provided resulted in additional customers. The initial export resulted in additional export.

The Center rated the importance of their technology export as "very important" (on a scale of Unimportant, Somewhat Important, and Very Important) for the company's market standings-both at home and abroad.

They suggested that the promotion system for the export of Egyptian technology and know-how could be improved by organizing the profession, training Egyptians in modern building technology, adapting modern technology to local conditions, and using the "Korean model", i.e., using the army, or private organizations, to train large numbers of workers and make them available for overseas

assignments. They also suggested that the international organizations could be used to set up a project for the purpose of training persons in a new management system. The workers are productive, but not organized, they believe. The UN might be able to use film to propagate successful examples, it was suggested.

The Center for Planning and Architectural Studies is presently listed with INTIB. The following table provides some data.

TABLE 1: Employment and Annual Turnover, 1980-82

Year	Employment	Turnover	
		in U.S.$	in LE[1]
1980	20	50,000	35,000
1981	35	150,000	105,000
1982	40	300,000	210,000

Source: The information provided by the Center.

[1]Converted at the official IMF exchange rate of $1.43 per LE.

Notes:

1. Called Alam Al Bena (Architecture World), it is published in English and Arabic. Its 20th monthly issue was published in March, 1982.

CASE #21

SEMAF

SEMAF is a public entity established in 1955, with technical assistance and equity participation of the Belgians and nationalized in 1961. Its products include freight cars, luggage cars, passenger cars, military hospitals, coaches, and inner-city trains for Egypt's public transit and railway services.

Their manufactured exports have included one car sent to the Sudan as a prototype (in 1975) and six cars sent to Albania in 1970.

The company does not produce 1st and 2nd class (luxury) cars. They have had inquiries from the Egyptian Railway Authority, their customer, to consider manufacturing them. However, the Egyptian Railway Authority's needs for such cars are covered up til 1990 from imports. By about 1986, new needs by the company will prompt them to seek new technologies. They may seek such new technologies from France and Hungary with whom they have had satisfactory technical arrangements in the past.

The sources of technology originally exploited by the company were from Belgium for their Fortnighter car and Japan (the Hitachi company) for their coach.

The Belgians who were part shareholders in SEMAF gave technical assistance under a licensing agreement. SEMAF also

had an agreement with the Hitachi company involving a lump-sum payment. The Japanese firm provided drawings, specifications, and documentations during 1964-65. Although SEMAF wished to continue business with the Hitachi company, the agreement was discontinued due to a lack of interest on the part of Hitachi.

SEMAF introduced no changes into the Hitachi design elements, some minor changes in their internal arrangements (for example, doors), but significant changes in the Belgian technology. The motivations behind these changes were to adapt to local market requirements, to substitute new materials, and problems which SEMAF was having with one part which Hitachi declined to assist with. However, the company on its own was able to modify the part with success. Now, the Rumanians would like to buy or license this technology from SEMAF but the company does not seem to be interested. They state this is because of their previous experience with the Rumanians. The costs and difficulties in making these changes were assessed by the company as minor.

Although the company has no significant R&D activity within the company, it does have a design office. (The company has assessed its R&D activities as "low" on a scale of Low, Average, and Above average). Their R&D staff presently consists of four engineers and eight draftsmen.

Approximately 0.5% of the company's investment outlays goes toward R&D and the financing of what little R&D activity the

company has is entirely through company outlays.

The education, training, and work experience of the company's top-level management came about in several ways: prior to their joining the company, at the company's request, and in connection with foreign partners at the time of their relationship.

SEMAF's technology exports include providing complete drawings and specifications for railway cars to a Rumanian manufacturer as well as providing training to individuals from Switzerland, Belgium, the Sudan, Ghana, Syria and Pakistan. The technology export opportunities came about primarily through the Egyptian government's request.

The motives behind SEMAF's entering the technology export market were (in order of importance): (1) Customer need to manufacture (i.e., The Egyptian Railway Authority). SEMAF was asked to provide drawings and specifications. A Rumanian railway equipment manufacturer was then assigned the task of making the cars using SEMAF designs for which SEMAF was compensated under a licensing agreement; (2) Corporate policies; and (3) The request by the Egyptian government.

Technology export is through both technical assistance (in 1978, a $100,000 contract provided for drawings to be sent from SEMAF to Rumania), as well as training, indicated above.

SEMAF provided drawings and specifications based on which the Rumanian firm was to produce for Egypt about 300 units of railway cars. According to SEMAF, the Rumanian firm has used these drawings not only for building railway cars for Egypt in excess of the 300 agreed upon, but has found a secondary market for the same design cars in Sri Lanka.

SEMAF did not change its technology for the purpose of export. They exported the same technology they were using and left it to the technology importers to adapt it for their customers.

The advantages that SEMAF had over its international competitors was that they were the sole supplier to the Egyptian Railroad Authority.

Their disadvantages were that the restrictions imposed by the Egyptian Railroad Authority were at times cumbersome.

SEMAF rarely used foreign collaborators.

The technology importing clients of SEMAF have generally been medium-sized, state-owned manufacturing companies. Their technology export resulted in no subsequent economic collaboration.

The licensing agreement with Rumania was an agreement according to which SEMAF would be paid a lump-sum of $100,000 and Rumania would produce between 80 and 300 units. In fact, though, the Rumanian company produced upwards of 1,480 units without compensating SEMAF proportionately, as they feel they

should have been.

The company felt that political problems between Egypt and other Arab countries prevented them from gaining more export markets. For example, SEMAF wanted more export opportunity in Kuwait, but was not permitted to do so.

The company felt it had been a mistake to sell its technology to other countries. They felt that Egypt should not have to import any coaches where SEMAF could be manufacturing them. Furthermore, the company indicated that the development of railroads in Africa and the Middle East will be intesified and that the Orient Express may come back (which up until 1948 originated from Egypt, according to SEMAF). They declared that they must maintain their own people and that no new joint ventures were being considered at the present. A rolling stock factory will be established by the Egyptian public sector, enabling SEMAF to obtain more of their inputs from domestic industry. Also, they expressed a need for laws that would give standards to the railway cars and also expressed a need for an R&D center.

SEMAF indicated that they received no help from either the government or private institutions in the technology exports. The company indicated a willingness to co-operate with the UNIDO/ INTIB system on a continuous basis.

The following table provides data on employment and production by SEMAF in recent years.

Table 1

Employment and Production, 1970 and 1973-81

Year	Employment	Production in U.S.$	Production in LE
1970	1,550	6,120,000[2]	2,400,000
....	.....	.....	.....
1973	1,780	10,455,000[2]	4,100,000
1974	1,802	10,857,900[2]	4,258,000
1975	2,023	17,296,650[2]	6,783,000
1976	2,299	27,058,050[2]	10,611,000
1977	2,333	28,407,000[2]	11,140,000
1978	2,400	35,595,450[2]	13,959,000
1979	2,520	40,004,250[3] 34,394,360[4]	27,975,000[1] 24,052,000[1]
1980	2,700	40,125,800[3] 43,758,000[4]	28,060,000[1] 30,600,000[1]
1981	3,017	58,178,120[3]	40,684,000

Source: Information provided by the company.

[1]GOFI data.

[2]Converted at the official IMF exchange rate of $2.55 per LE.

[3]Converted at the official IMF exchange rate of $1.43 per LE.

[4]GOFI data converted at the official IMF exchange rate of $1.43 per LE.

CASE #22

EL NASR FORGING COMPANY

El Nasr Forging Company is a public sector company established in 1961 with technical and financial assistance from the Soviet Union. It manufactures forged steel for the auto and railway industries, electric welded chain links, and similar products. It exports its products to France, Iraq, Poland, the Soviet Union and, to a lesser extent, to the Third World.

Although the original technology came from the Soviet Union in the form of design, training, engineering works and technical assistance, a modernization plan is now in the works. The company plans to import new technology for a new line of products and processes from West Germany and other countries in Western Europe. They also plan to increase their exports to France and acquire technology from Vauxhall (a British company) for farm machinery and the auto industry.

El Nasr Forging Company found it necessary to make significant changes in the imported Soviet technology in order to face customer requirements (Western specifications). These technologies were hard to adapt to Western specifications, according to the company.

The motivations behind these changes were thus to adapt the technology to meet local market requirements and to meet customer specifications. The costs and difficulties in making these changes were rated by the company as "high" on a scale of Minor, Significant,

and High, as it was necessary to match Eastern technology to Western specifications.

The company does have an R&D center. In addition, the El Tabbin Metallurgical Institute is physically inside their facilities but not under the jurisdiction of the company. It is a governmental training center.

The company has assessed the intensity of its R&D activity (relative to other Egyptian firms) as "above average" on a scale of Low, Average, and Above Average. They feel that the nature of the market is such that the company feels they must maintain a better-than average R&D level of activity.

Approximately 6 persons, out of the 1800 employees, are involved in design research and 30 in quality control. Over 5% of the company's investment outlays is spent on R&D. This is evidently a rule-of-thumb formula followed by the Ministry of Industry for its GOFI companies. However, several of the companies visited admitted that their R&D outlays fell far short of GOFI guidelines. Despite its high assessment of its R&D acitivity, the company indicates that it applied for no patents either within Egypt or abroad between the years of 1975-81. R&D activities within the company are financed by the company outlays, government subsidies and grants, and through international organizations.

The top-level management of the company received formal education, training and work experience in several ways: before

joining the company; through the company's initiative; as well as in connection with agreements with the Soviet Union where, under the terms of the initial contract, training was provided for the company personnel in the Soviet Union. The technology export of the company is in the form of training foreign personnel as well as the flow of company's skilled workers to other countries. These came about through the company's initiative, the Egyptian government's request, the host country's government's request, and through the recipient firm s request.

The motives behind El Nasr's training of non-Egyptians were (in order of importance): (1) Corporate policies; (2) a request by the Egyptian government; and (3) a request by the host country government. Trainees came from West Germany, the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Qatar, the Sudan, Nigeria, Tanzania, and Somalia. The foreign firms employing these trainees were relatively large private and public manufacturing entities.

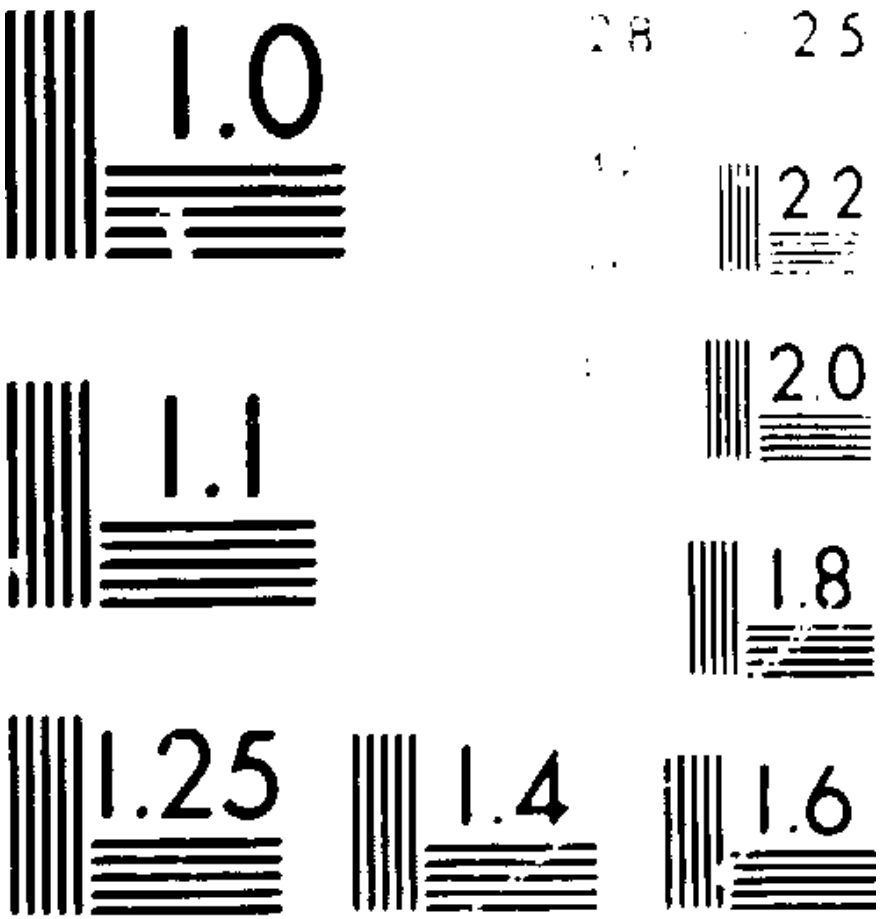
Between 1972-81, the company trained 35 trainees at the factory from the Sudan, Poland, Yugoslavia, Tanzania, and West Germany. In addition, the Company estimated that 206 of its technical staff were working abroad in 1979. This figure increased to 225 in 1980 and 250 in 1981. The destinations of these skilled workers included the U.S.A., Canada, Saudi Arabia, United Arab Emirates, Iraq, Kuwait, Bahvain, Qatar, the Sudan, Nigeria, Tanzania and Somalia. The company gave the reasons for its lack of substantial technology exports so far as their conviction of their inability to fight eventual competitors and their

lack of relevant human and financial resources. In the company's judgement, competition from advanced industrial countries--especially the U.S. and Japan--have made entry into foreign technology markets nearly impossible for a Third World company such as the El Nasr Forging Company. They believe they can not fight their international competitors. They also believe they do not have the relevant human and financial resources to make headway in the international market.

The company felt that its venture into the technology export market--to the small extent it did take place--was prompted and encouraged by their government who wished the company to engage in training to help fulfill reciprocal agreements between governments. At any event, the primary motive was non-commerical.

The company expressed a willingness to co-operate with the UNIDO/INTIB system on a continous basis. They felt that an outside organization, such as the UN, should organize Third World companies and give more technical assistance than they have in the past.

The following tables give employment, production and export by El Nasr Forging Company in various years.


1.0
2.2
2.0
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1.8
1.25
1.4
1.6

TABLE 1: Employment and Production

Year	Production (tons)	Employment
1970	2,764	1,897
1973	3,913	2,196
1974	4,048	2,088
1975	4,465	2,141
1976	4,211	2,084
1977	5,527	2,076
1978	4,606	2,002
1979	4,356	1,901
1980	5,756	1,770
1981	7,982	1,843

Source: The company.

TABLE 2: Production and Exports

Year	Production		Exports	
	in U.S.$	in LE	in U.S.$	in LE
1975	12,097,200[1]	4,744,000	3,031,950[1]	1,189,000
1979	5,820,000[2]	4,070,000	N.A.	N.A.
1980	8,414,120[2]	5,884,000	N.A.	N.A.

Source: GOFI

[1]Converted at the official IMF exchange rate of $2.55 per LE.

[2]Converted at the official IMF exchange rate of $1.43 per LE.

N.A. = Not Available.

TABLE 3: Volume of Exports (in tons) to the U.S.S.R. and Poland, 1970-75

Year	Volume (tons)
1970	1,272
1971	6,522
1972	1,721
1973	4,967
1974	7,255
1975	5,612

Source: The company.

TABLE 4: Exports to Other Destinations, 1970, 1973-81

Year	Exports in U.S.$	Destination
1970	278,000	Third World
1973	1,086,000	Third World
1974	1,502,000	Third World
1975	1,177,000	Third World
1976	56,000	Iraq
1977	8,000	Iraq
1978	-	-
1979	-	-
1980	-	-
1981	10,000	France

Source: The company.

CASE #23

NATIONAL RESEARCH CENTRE

The National Research Centre (NRC) was established in Cairo in 1956. It is the largest scientific establishment working in the field of science and technology in Egypt. Since the establishment of the National Academy of Scientific Research and Technology in 1971, the NRC has become one of the Academy's affiliated institutions.[1] It has collaborative research activities and interactions with all the Egyptian universities and other relevant organizations. It also has agreements and collaborative working arrangements with the United States' National Academy of Science and similar institutions in the developed countries as well as the Arab World.

The NRC carries out scientific research, both basic and applied. The NCR also offers scientific and technical consultations, as well as arranging training courses, scientific symposia and conferences. It has a selection of specialized scientists in the areas of industry, agriculture, health and other areas. The structure of the NRC is comprised of laboratories, a pilot plant, management and auxiliary functions. Also affiliated to the NRC are a number of specialized institutes, as shown in the organization chart at the end of this case.

The Centre is governed by a Board of Directors, headed by the President of the NRC. Members of the Board are Secretary General

of the NRC, Heads of the Divisions, Under-Secretary for Administrative and Financial Matters, as well as representatives of the Ministries of Industry, Agriculture and Health.

The organizational body of the NRC is comprised of divisions, which in turn, are subdivided into specialized laboratories as follows:

1. Textile Industries Research Division
   - Dyeing and Finishing Lab
   - Spinning and Weaving Lab

2. Food Industries Research Division
   - Food and Dairy Industries Lab
   - Fats and Oils Lab
   - Nutrition Lab

3. Pharmaceutical Industries Research Division
   - Pharmaceutical Lab
   - Therapeutical Chemistry Lab
   - Natural Products Lab

4. Chemical Industries Research Division
   - Paper and Cellulose Lab
   - Tanning Materials and Protein Chemistry Lab
   - Polymers and Pigments Lab
   - Chemistry of Pesticides Lab

- Ceramics and Glass Lab

5. Agricultural and Biological Research Division

   - Botany Lab
   - Pests and Plant Protection Lab
   - Soil and Water Uses Lab
   - Animal Production Lab
   - Animal and Poultry Nutrition Lab
   - Animal Diseases Lab

6. Medical Research Division

   - Basic Medical Lab
   - Pharmacology Lab
   - Human Genetics Lab

7. Environmental Research Division

   - Water Pollution Lab
   - Air Pollution Lab
   - Occupational Health and Industrial Medicine Lab

8. Engineering Research Division

   - Mechanical Engineering Lab
   - Solar Energy Lab

9. Applied Organic Chemistry Division

   - Organic Chemistry Lab
   - Biochemistry Lab

10. Applied Inorganic Chemistry Division

- Physical Chemistry Lab
- Inorganic Chemistry Lab

11. Physics Research Division

- Solid State Physics Lab
- Spectroscopy
- Microwave Lab
- Theoretical Physics Lab
- Electron Microscope Lab

12. Basic Science Research Division

- Microbiological Chemistry Lab
- Genetics and Cytoloty Lab
- Earth Science Lab
- Photochemistry Lab

13. Laboratories affiliated to the President's Office

- Pilot Plant Lab
- Central Service Lab
- Microanalytical Lab
- Animal House
- Cell Biology
- Child Health Lab
- System and Information Sciences Lab

The NCR has always realized that advancement in the fields of industry, agriculture and health is dependent on research and development in these areas. The need for applied science which serves the development of the society, led the NRC to direct its efforts to solve developmental problems. Thus in 1975, the NRC introduced a system for programming research through contracts, to focus on priority developmental problems. The five programs which are developed are as follows:

1. Technology Transfer Program
2. Food and Agriculture Program
3. Health and Environment Program
4. Energy Program
5. Natural Resources Program

The Technology Transfer Program is directed towards research to create new Egyptian technology as well as the development and adaptation of imported technology in industrail areas. Major areas involved are: textiles, metallurgy, food, chemical and engineering industries.

The Food and Agriculture Program is directed towards developmental research in the area of food and agriculture. The increase of crop productivity, animal wealth and industrial research for agricultural and animal products is the main aim of this program. This program is intended to help Egypt's efforts toward food self-sufficiency through improvements in the food productivity.

The Health and Environment Program is directed towards research aimes to alleviate health problems, especially problems of environmental pollution. Under this program, research is also directed towards parasitology, especially bilharzia and ophthalmology.

Under the Energy Program, research and development is directed towards the area of non-conventional energy. Special attention is given the use of solar energy and its application in cooling, dehydration of agriculture products, water heating, desalination of salt water and generation of electricity for small communities. The production of biogas from waste products is presently under development in rural areas. Finally, the exploitation of wind as a source for energy is also under investigation.

The Natural Resources Program is directed towards the exploitation of mineral ores in Egypt. A survey is being carried out and the optimum conditions for the utilization of these resources are being studied. Research is also directed towards the development of the qualities of local ores, e.g. the phosphate and iron ores.

In addition to the aforementioned divisions, a number of research institutes affiliated to the NRC were established to serve developmental areas. These institutes are as follows: The Central Metallurgical Research and Development Institute (CMRDI); The Theodor Bilharz Research Institute; The Ophthalmology Research Institute; and the Electronic Research Institute.

The attached organization chart presents a schematic view of the National Research Centre. Given its substantial resources and capabilities, it would be natural for the NRC to contribute not only to the development, transfer and diffusion of technology into and within Egypt, but also to be a significant agent in transferring skills and skilled manpower from Egypt to other countries.

According to its special Silver Jubilee report The National Research Centre: A Quarter Century 1956-1981 (in Arabic), the Centre had conducted some 248 training programs for a total of 797 weeks for 1,665 trainees from abroad. Tables 1 and 2 provide detailed data on these training programs. Table 1 shows training programs conducted by NRC for Saudi, Iragi, Algerian, Libyan and Kuwaite trainees between 1975 and 1980. A total of 903 were trained during the six year period, according to this information.

Table 2 provides data on training courses in various fields provided by NRC during 1974-81. (There appears to be a sizeable discrepancy between these two tables. We are at a loss on a possible explanation).

In addition to training programs conducted in Egypt for non-Egyptians, there are a large number (estimated at several hundred) NRC technical employees working abroad at any given time. Table 3 gives a breakdown of NRC's high level manpower (people with graduate degrees, often Ph.Ds) abroad in three selected years. In addition

to those reported in Table 3, several hundred lower level technical and professional staff from the Centre live and work abroad on their own or on assignment from the Egyptian government.

Table 1

Training Programs Conducted by NRC
For Non-Egyptians According to Country of Origin

Year	Saudi Arabia	Iraq	Algeria	Libya	Kuwait	Total
1975	32	22	12	7	5	78
1976	112	29	18	18	4	181
1977	113	37	22	12	2	186
1978	112	32	13	8	3	168
1979	108	23	13	2	1	147
1980	110	20	11	1	1	143
					TOTAL	903

Source: The National Research Center, Ingazat al-Markaz al-Ghawmi al-Bohuth fi Robe'Gharn (NRC's Accomplishments of A Quarter Century)(Cairo: NRC, 1981, in Arabic), p. 251.

National Research Centre: Organization Chart

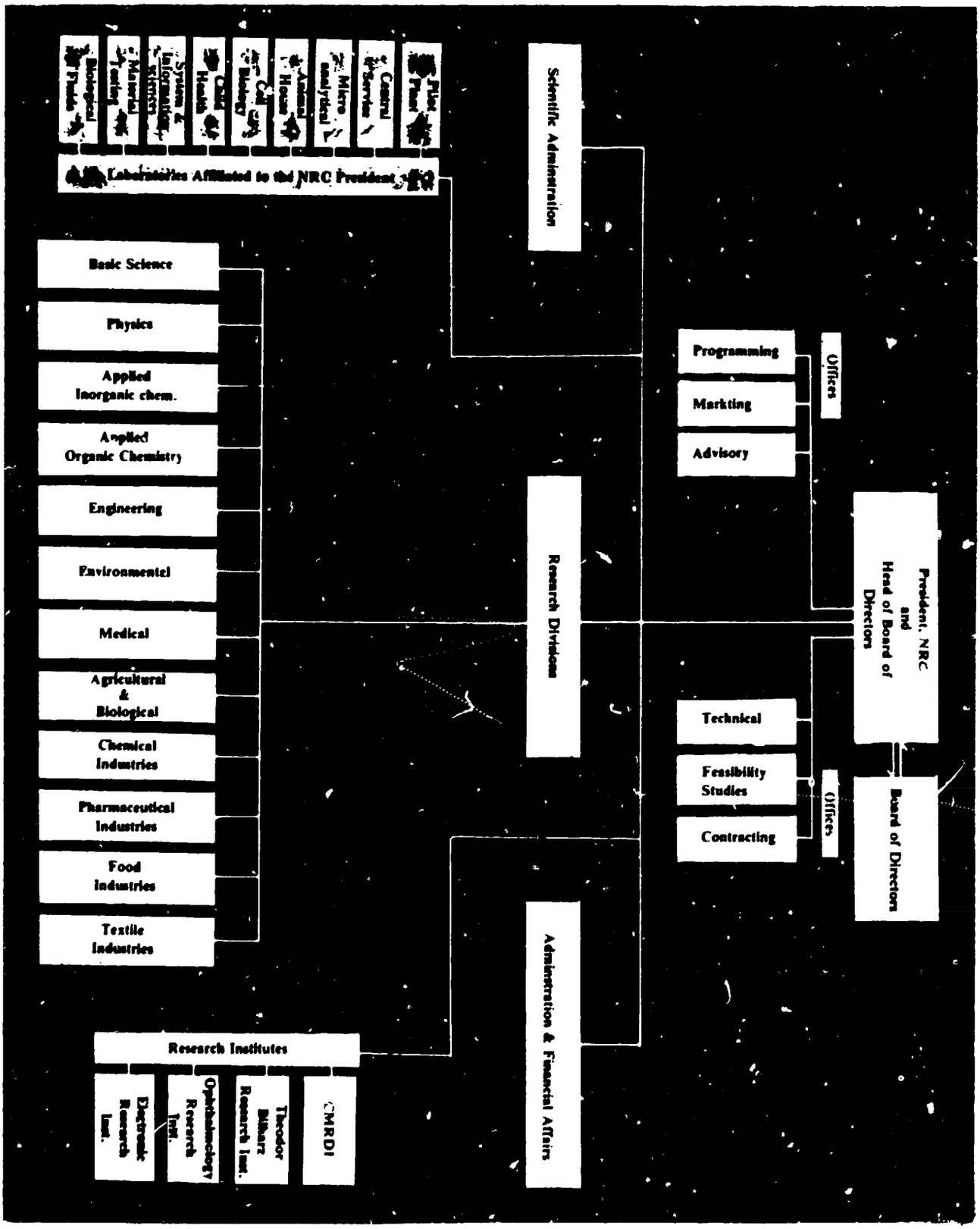

Table 2

TRAINING COURSES PROVIDED FOR NON-EGYPTIANS BY NRC

1974-81

Field	Year	Direction	No. of Trainees	Period of Training
Instrument Analysis	1974	Saudi Arabia	5	23 weeks
Chemistry	1974	Saudi Arabia	6	12 weeks
Geology	1974	Saudi Arabia	2	12 weeks
Natural Sciences	1974	Saudi Arabia	4	16 weeks
Zoology	1974	Saudi Arabia	2	3 months
Botany	1975	Saudi Arabia	1	3 months
Chemistry	1975	Saudi Arabia	2	1 month
Chromatography	1975	Saudi Arabia	1	9 weeks
Pharmacology	1975	Saudi Arabia	1	4 weeks
Glass Blowing	1975	Saudi Arabia	1	13 weeks
Microscopic Pathology	1975	Saudi Arabia	1	8 weeks
Electrical and Electronic Industry	1975	Saudi Arabia	1	13 weeks
Engineering Workshop	1975	Saudi Arabia	2	13 weeks
Solar Energy	1976	Libya	3	1 month
Glass Blowing	1976	Libya	1	3 months
Eng. Glass	1976	Saudi Arabia	1	12 months
Inorganic Chemistry	1976	Saudi Arabia	2	6 months
Scientific Instruments	1976	Iraq	2	3 months
Physics	1976	Iraq	5	1 month
Metalurgy	1978	Kuwait	1	2 weeks
Ecology	1978	Kuwait	5	2 months
Agriculture	1378	Kuwait	4	3 months
Analysis (Chemical)	1978	Saudi Arabia	1	10 weeks
Nutrition	1978	Saudi Arabia	2	3 months
Metalurgy	1978	Somalia	1	3 weeks
Energy	1978	Somalia	1	2 weeks
Ecology	1978	Somalia	1	5 weeks
Food Industry	1979	Saudi Arabia	4	12 weeks
Micro-organic Analysis	1980	Saudi Arabia	2	4 weeks
Financial & Management Training	1981	Saudi Arabia	3	3 months

Source: The NRC.

Table 3

NRC TECHNICAL PERSONNEL* ABROAD, Selected Years

Countries	1974	1976	1980
Sudan	1	-	-
Iraq	12	13	17
Algeria	8	6	8
Saudi Arabia	13	14	40
Yemen	3	-	-
Libya	4	7	-
Zambia	1	-	-
Kuwait	1	-	-
Central Africa	1	-	-
Mauritania	-	-	2
Jordan	-	-	1
Pakistan	-	1	1
Kenya	-	1	1
Qatar	-	2	1
Nigeria	-	1	1
Oman	-	-	2
TOTAL	44	45	74

Source: Data provided by the NRC.

*Persons with high levels of education, often Ph.D.

FOOTNOTE

[1]The other institutions under the overall jurisdiction of the Academy are The Atomic Energy Establishment, Specialized Institutes (Oceanography & Fisheries, Astronomy & Geophysics, Standards, and Petroleum Research), and Auxiliary Service Centres (Scientific Developments, National Information and Documentation, Patent Office, and Science Museum).

Chapter VI

Summary and Conclusions

1. Introduction

This study has detailed the incidents of the outflow of technology-in its broadest interpretation-from Egypt. The underlying objectives have been, first, to provide an overview of the orders of magnitude, nature, direction and other characteristics of technology exports. Second, we explored the motives and underlying causes of such flows; and third, on several occasions we explored the implications for, and the impact upon, Egypt. In this concluding chapter, we shall explore further, by way of conclusion, some of the positive and negative effects, and will draw general conclusions for both policy and research. Let us first review.

2. A Brief Overview

Chapter I of this report contained a brief review of the relatively young (and growing) literature on the technological maturity of Third World countries and the manifestations of this growth in the specific form of technology exports. It concluded with an outline of the purpose, scope, and method of the present study, which is aimed at adding some information and insight to this line of inquiry.

In Chapter II, we provided an overview of the Egyptian

economy, its historical evolution, present structure and policies, and endowments and limitations. It was pointed out, inter alia, that Egypt's lead in industrial development, coupled with relative abundance of manpower as well as cultural proximity, are factors which have helped internationalize the Egyptian economy. Shortcomings of the economy, including single-commodity dependency in exports, and balance of payments difficulties, were also briefly dealt with. An outline of Egypt's industrial structure was followed by a look at the public sector enterprises associated with the General Organization for Industrialization, (GOPI), under whose general supervision the majority of government companies operate.

We then turned to a detailed analysis of data derived from a questionnaire completed during field research, and pitted the results against the seven hypotheses which had derived from the analysis in the previous chapters.

This chapter provided us with a portrait of technology exports from Egypt. It is appropriate to recapitulate some of the major conclusions from Chapter III. Seven hypotheses were posed and tested. The first was that the mode of technology transfer from Egypt is predominantly person-embodied. Second, the primary motive of Egyptian firms exporting technology is political-cultural. Third, the suppliers' advantage over non-Egyptian firms in markets abroad is likely to be political, cultural

or commercial links. Fourth, recipient firms are most likely public sector enterprises. Fifth, exported technology undergoes minor modification. Sixth, most often the exported work is not more sophisticated than domestic work. And seventh, firms with high export performance overall are also likely to be high technology exporters.

To validate these hypotheses, we introduced data on 66 instances of technology exports by 23 entities (private and public) which had been interviewed. An overall survey of these firms indicated that Egypt has had only a modest amount of technology exports, during the decade under study. Moreover, as hypothesized, an overwhelming majority of the instances identified in the survey are person-embodied transfers. Cases such as the National Research Center and The Egyptian International Research Center for Agriculture particularly highlight and confirm this hypothesis. They are both involved heavily in training and in export of skilled manpower from Egypt.

The second and third hypotheses were also confirmed by data showing the importance of political and cultural ties. Later, in Chapter IV, when discussing skilled manpower exports from Egypt, similar advantages (language, cultural ties) were shown to have a dominant effect. The fact that destination of overwhelming majority of technology export instances were Arab countries confirmed this point even further. So did the data

on the types of firms receiving Egyptian know-how. Most of them were state owned, it turned out, thus confirming the fourth hypothesis.

About three-quarters of valid responses indicated little or no adaptations were undertaken prior to the export of technology. And so the fifth hypothesis was also confirmed. Furthermore, over 70% of valid responses said there was no difference in the degree of sophistication between export work and that done in house. Again, the sixth hypothesis was found to be supported by evidence.

To test the seventh hypothesis, a correlation test between overall technology and export performances of the sample firms was performed, revealing the existence of a statistical relationship.

Thus the seven hypotheses with which we began the chapter all withstood the test of empirical validation.

We then turned to an in-depth examination of the exodus of skilled manpower from Egypt. It was noted that this phenomenon, while gaining important advantages to Egypt, had created serious strains in the economy as well. These strains, we should note, have been so serious as to prompt the President into including the search for a solution to the shortage of skilled manpower among his serious major economic points, as explained in Chapter II. But they have not been severe enough to warrant dramatic and extreme counter-measures such as halting the outflow through government

fiat. Even in the unlikely event such drastic policies were to be considered by the government of Egypt, their effective implementation would be seriously questioned. This is so because they would be difficult to administer and the diversity of channels (countless private and public organizations are involved), not to mention the twin negative effects of such measures on employment and balance of payments situations. Such extreme policies are not contemplated at present because, as we saw in Chapter III, there is no unanimity on the total impact, let along policy response to it.

Our review of the labor migration situation thus led us to the policy dilemna facing Egypt's economic policy makers. To allow the perpetration of the status quo would mean to continue to suffer and gain from the results of Egyptian labor abroad. To devise a more optimum policy would mean altering the present equilibrium without knowing fully what the new one will usher in. Whatever the course, we concluded, it must be devised with more accurate information at hand than currently available if it is expected to succeed.

The next chapter was devoted to in-depth reports on each of the 23 cases we had interviewed. These case studies highlighted in more detail some of the points made in more general terms in the overview sections. Major themes which emerge from these cases, together with the analysis in the previous four chapters, will now be reiterated with a view toward conclusions for policy and research.

3. Emerging Issues: Some Trends and Conclusions

Exports of technology from a country, as was said at the outset of this study, are manifestations of that economy's technological maturity, and increased organizational sophistication of its firms.[1] They are also indicative of the increasing interdependence of the global political economy and the ever increasing role played in it by the less industrialized countries. As these exports increase, they bring a mixed bag of results. Furthermore, the rate at which they increase as well as the precise direction and nature they take, are all subject to a variety of forces.

In examining the case of Egypt, we have seen that some of these forces have favored and promoted the export of technology and know-how as well as skilled manpower from Egypt, while others have hindered it. Some results have been positive; others negative.

Forces and factors favoring expanded technology exports from Egypt have included the following:

a. Pecuniary Gains: The person-embodied type of outflow, as far as the individuals are concerned, has clearly been influenced more by financial rewards than by any other incentive. Differences in salary between Egypt and countries hosting skilled Egyptian workers is sufficient testimony. But the accumulative result of these earnings have also meant added foreign exchange for the Egyptian treasury.

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[1] These points are made frequently in the literature. See Lall, 1982 [23], Dahlman and Westphal, 1982, [12], and various articles in Kumar and Mcleod, 1981, [22].

Other types of technology exports, too, have been influenced by pecuniary gains, albeit to a less extent. We noted in several case studies that financial rewards were either non-existent or insignificant as a motive, although they did play a role in many.

b. "Appropriateness" of technology or service: It was noted that, because of similar factor intensities between Egypt and its technology recipients, processes offered by Egyptian firms have been, on the whole, more suited to the prevailing conditions and tastes of recipients. This has proven to be an important factor in favor of Egyptian firms and skilled personnel abroad.

c. Cost competitiveness: Many of the technologies offered by Egypt, by they person-embokied or otherwise, have a clear cost advantage, especially viz-a-viz Western European and U.S. sources. This is so not only because of generally lower prices in Egypt but often because services provided by Egyptian firms are somehow subsidized by the government. In the case of manpower, Egyptian workers (skilled as well as semi-skilled and unskilled) command lower pay than Europeans or Americans.

d. Cultural proximity: Being a member of the Arab World has been a clear advantage to Egypt not only for cultural reasons per se but also for practical reasons which stem from this cultural bond, namely the lack of a language barrier between Egyptians and their hosts. These commonalities are greatly emphasized in the integration literature as well. In the case of Egyptian technology exports, they are dominant.

e. "Litmus Test": At the national level, export of technology is a good test of the ability of the economy to internationalize. Similarly, a true test of a firm's ability to produce a product or perform a service at a competitive price and quality comes when the firm ventures out of the familiar (and often protected) walls into international competition. Thus international involvement of Egyptian firms could well reflect the extent of that economy's "technological mastery" (Dahlman and Westphal [12]). The relatively modest level of technology exports from Egypt, compared to those from newly industrialized countries such as Argentina, Brazil and Korea, reflects its relatively less industrialized economy and its concomitant--"technological mastery."

f. "Safety Valve": Using the surplus capacity (in manpower, training capacity, or idle know-how) outside of the country can have the twin benefits of moving the system toward full employment while providing an outlet to defuse tensions resulting from over-staffing. Modest progress in achieving both of these goals has been made.

g. Political Considerations: Like other forms of international economic involvement, technology exports can be motivated by non-economic factors. Either broader national interests, or interests of certain groups or entities, may be served. Thus, some Egyptian technology exports may have been influenced by the choice of beneficiaries as well as any other factor.[2] The state may consider it

[2]See Kumar [22:190], and Enos (in Stewart and James, 1982 [38]: 69-81).

in its broader national interests to underwrite or otherwise promote technology exports; and firms which are in a position to perform those services will often find it expedient to offer their resources. Our data shows that, together with cultural ties, this factor has played an important role in technology exports from Egypt.

Against these favorable considerations, there are constraints on the process of technology exports from Egypt. These include the following:

a. Pecuniary gains are often insignificant, and would not be sufficient as a force. We noted in serveral case studies, for instance, that services were provided to clients by Egyptian firms at nominal costs (even some times at no cost at all) to the recipient firm. Costs were either absorbed by the supplying firm or underwritten by the Egyptian government. Moreover, gains which accrue to individuals or firms as a result of their export activity may create shortages, structural disequilibrium or external diseconomies. These, we have noted, have occured in Egypt.

b. While "appropriate" as to product type and/or factor mix, Egyptian technology may lack the "snob appeal" characteristic of the most modern and sophisticated ones. Many clients (public and private) in the Gulf area tend to prefer the latest Western technologies. One reason is the perceived (and often actual) superior quality; the other is capital abundance. Some of our respondents felt they could or did perform on a par with international standards, yet suffered from an image problem.

c. Structural rigidities: Often international demand for Egyptian know-how is in areas which are critically needed domestically as well. Shortages in certain skill categories, therefore, can not be readily compensated by shifting workers from other areas. The paradox of unemployment, or structural disequilibrium, where unemployment and shortages occur simultaneously, is thus accutely evident in Egypt.

d. Vulnerabilities: Dependence on outside markets for exports of skilled workers and other activities entails vulnerability to changing political or economic climates in host countries. The greater a country's international involvement and the fewer the number of host countries on which it depends, the greater the vulnerability.

e. Pecuniary costs: Where technology exports are subsidized for non-economic consideration, the cost must be borne by the "donor" country (as this takes on a form of aid). Moreover, as training is provided (on-the-job or at training centers set up at government or industry's expense) to individuals who are then "lost" to foreign markets (even if temporarily), the cost of training replacements escalates.

These are some general factors which favor or hinder technology exports. Below we will draw implications for policy and research.

4. Implications for Policy and Research

We conclude this study by drawing policy implications for UNIDO and Egypt and highlighting issues in need of further research.

a. Policy Recommendations for UNIDO:

1. This study has identified the firms engaged in (or potentially capable of) technology exports, and the nature of their own technological needs. UNIDO should draw upon its resources to provide training, technical assistance and information where such needs have been identified, and wherever else it may exist, to the best of its ability.

2. UNIDO should assist the government of Egypt in its own attempts to formulate an integrated technology export policy as a part of a broader policy framework, to be discussed below.

3. The more advanced firms as well as those in the intermediate stages of their development can use INTIB to a far greater extent than in the past. Many Egyptian firms which have been exposed to the system in the present research should be encouraged to make use of it.

b. Policy Recommendations for Egypt

1. More than anything else, there is a dire need for more information. CAPMAS and a variety of other agencies are presumably at work surveying the landscape. But there is plenty of room for improvement, both in quality as well as quantity of data. Manpower movement, most heavily studies, is still slightly ahead of pure guesswork.

2. Technology export should be related both to technology acquisitiong strategy and the overall science, technology and development policy. (see Sagasti [34]. Some headway toward devising a systematic science and technology policy has been made, including conferences and studies (see Fayez [14], Hussein [19], Sarkass and Kader [35]). But much more rigorous work remains; and interagency coordination is absolutely essential.

3. To a reasonable degree, the government should facilitate and assist the technology export activities of its firms. While too much support can distort the true picture, and hence must be avoided, there are cases where governmental support can be constructive.

4. It is advisable to apply some cost-benefit analysis to technology exports, particularly the export of skilled manpower. This is clearly an interagency task requiring UNIDO imput as well.

c. Issues for Further Research

1. The case studies being undertaken by UNIDO should be integrated toward a comparative synthesis.[3] If the World Bank case studies are included, this comparative study would have an even greater value in shedding light on this subject on a global scale.

2. The eclectic-theory of international economic involvement, articulated by Dunning [13] on the basis of work done at Reading and elsewhere in the last two decades, proposes that international economic involvement will occur to the extent that the firm has

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[3] See Wahba [47] for one example of integrating country policies.

proprietary (firm-specific) advantage and the country has a location-specific advantage. The magnitude and composition of technology exports from Egypt (high and tilted toward skilled labor) means that location-specific advantages outweigh firm-specific advantages. This poses the theoretical question: is there a positive correlation between the level of development of the supplier country and firm-specific advantages (as compared to location-specific ones)? A comparative study of technology exporting countries could shed light on this question.

3. What is the relative share of person-embodied technology transfer among LDCs?

4. What are the implications of mass labor exports on the productive sector and the educational and training infrastructures?

5. What is the range of policy choices in supplier countries in their attempt to minimize negative consequences of technology exports (e.g. shortages, inflationary impact)?

6. What is the experience at the receiving end? Most all case studies of technology exports from developing countries have concentrated on the supply side of the flow. It would be instructive to examine the recipients' experiences, in light of which more effective policies at both ends of the flow as well as international organizations can be devised.

APPENDICES

- Appendix 1: The Questionnaire
- Appendix 2: Background and Comparative Statistics
- Appendix 3: GOFI Companies

UNIDO
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

VIENNA INTERNATIONAL CENTRE
P.O. BOX 300, A-1400 VIENNA, AUSTRIA
TELEPHONE: 26 310 TELEGRAPHIC ADDRESS: UNIDO VIENNA TELEX: 1'5612

REFERENCE:

Q U E S T I O N N A I R E

On Technology Exports
From Egyptian Firms, 1970-1981

PART I : General Information

1. Name of Organization

_____

_____

2. Postal Adress

_____

_____

_____

3. Cable Address _____

Telex _____ Telephone _____

4. Name and Title of Head of Organization

_____

_____

5. Name and Title of Contact Person

_____

_____

_____

PART II : Baic Characteristics of Organization/Enterprise

6. Year of establishment

7. Type of Ownership (majority-owned foreign subsidiary; majority-owned domestic corporation; public entity; private entity; R+D institution, others) Please underline as appropiate.

8. Product/Service/Range - Please specify below and mark in the list at the end of this questionnaire.

9. Overall employment and Production Value according to Tables 1 and 2

Table 1 : Employment (in number of employees) and annual production value (in US$ million)

	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
Employment										
Value of Production										

10. Table 2 : Export Performance in 1970-1981 in US$ 1,000

Country of Destination	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
USA/Canada and Wstern Europe										
United Arab Emirates										
S. Arabia										
Kuwait										
Bahrain										
Quatar										
Jordan										
Iraq										
Sudan										
Morocco										
Tunisia										
Rest of Africa										
Rest of Third World										
Eastern Europe										

11. General Profitability Performance:
(Low, Satisfactory, Good, Very Good)
Please underline as appropiate.

12. Organizational Development Strategy (Please specify in general terms regarding specialization, export orientation, in-house R+D, future plans for development, acquisition and export of technology, etc.)

13. Sources of Technology Originally Exploited within the Organization

14. If imported, details of licensing arrangement. Royalty Structure:

Rate _____ Duration _____ Base _____

Additional payments (specify)

15. If imported, whether the organization introduced some changes in it: No, Minor, Significant, Radical. If possible give a short description.

16. Basic motives behind changes:

a/ cost savings;

b/ adaptation to local market requirements;

c/ size of the market;

d/ substitution of new materials;

e/ difficulties in obtaining spare parts;

f/ lack of relevant skills;

g/ others, please specify;

_____

_____

17. Costs and difficulties in making improvements: Minor, Significant, High. Please specify

_____

_____

_____

_____

18. Do you have any Research and Development (R+D) works within the organization: yes/ - no/

a/ if there is any R+D effort within the company, how is the technological know-how generated?, Please specify: _____

_____

_____

_____

b/ if there is some R+D activity, how would you assess its intensiveness:

a/ low

b/ average

c/ above average

d/ others - Please specify: _____

_____

c/ basic characteristics of R+D activity:

a/ number of R+D staff currently employed:

_____

b/ R+D outlays as % of investment outlays of the company:

_____

c/ number of patents applied for, in 1975 - 1981: _____

of which abroad? - Please specify: _____

d/ number of patents granted in 1975 - 1981: _____

of which abroad: _____

Please specify the countries: _____

_____

d/ What are the sources of financing R+D activity:

- your own outlays;
- government subsidies and grants;
- international organizations;
- others, Please specify: _____

19. Management of the organization. Specify whether president, vice-president or division heads have had formal education, training, or work experience abroad:

a/ at Company's initiative;

b/ prior to joining the firm;

c/ in connection with foreign partners.

PART III. Characteristic of Technology Exports

20. How did this technology export opportunity come about:

- your own initiative;
- your Government request;
- host Government request;
- recipient firm request;
- other, Please specify. _____

_____

_____

21. Motives for entering the technology export market (1 = most important, 2 = second most important, etc.)

- higher profits abroad;
- existence of excessive capacity;
- corporate policies;
- offer of Government subsidy;
- need to circumvent tariff and quotas in export markets;
- exploit accumulated experience and know-how;
- threats to existing markets;
- request by our own Government;
- request by host country Government;
- others; (if possible, please specify)

22. Nature of Technology Export:

(a) Table 3: Annual total value of technology exports in US$(1) and number of contracts (2) according to -

Specification	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
1. Patent License (1) (2)										
2. Know-How License (1) (2)										
3. Consulting, Engineering, Mgt., Serv. (1) (2)										
4. Tech. Assistance (1) (2)										
5. Turn-Key Plants (1) (2)										
6. Direct Foreign Investment (1) (2)										
7. Labor supply # contracts # persons										
8. Others (1) (2)										

(b) Table 4: Directions of exportations according to:

Country of Destination	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
USA/Canada and Wstern Europe										
United Arab Emirates										
S. Arabia										
Kuwait										
Bahrain										
Quatar										
Jordan										
Iraq										
Sudan										
Morocco										
Tunisia										
Rest of Africa										
Rest of Third World										
Eastern Europe										

(c) Sophistication of the export work in comparison to domestic: No Difference, Less Sophisticated, More Sophisticated (if possible, please give a short explanation of your opinion).

(d) How much fresh technological effort was required to mount the technology export project: None, Minor Adaptations, Significant Changes in Existing Technology, Additional R+D work... (if possible, please specify in detail).

(e) Whether technology export required any organizational changes within the organization - i.e. establishment of a new department handling the matter, employment of new people, etc.:

(f) What was the nature of your advantage over your international competitors: Cost of Technology, Quality of Production, Scale, Political, Commercial or Cultural Links, Experience in dealing with Foreign Buyers, etc. Other advantages (please specify in detail)

(g) What were the disadvantages vis-a-vis foreign competitors (in terms of cost, brand name, experience, etc.). Please specify in detail.

(h) Presence of foreign collaboration (please specify the extent).

_____

_____

_____

23. Nature of technology importer (s)

a/ ownership status;

- private entity;
- state owned company;
- minority foreign participation;
- majority foreign participation;
- others, please specify: _____

_____

b/ relative size of the importer

- small
- medium
- big

c/ Nature of the importer's activity

- manufacturer
- public utility
- R+D establishment
- consulting and engineering company
- contracting company
- others, please specify: _____

_____

d/ Whether technology export gave rise to subsequent economic collaboration in:

- production
- market
- technology development
- others, please specify: _____

_____

24. Organization of export activity:

(a) How were foreign markets first explored (please specify):

_____

_____

(b) How was information on potential customer obtained (please specify):

(c) How were bids put in (please specify):

(d) How were foreign collaborators found (if any)

(e) How did collaborative arrangements with foreign firms work (please give a short description):

(f) How was financing arranged (please specify):

(g) What were the major problems encountered:

25. What were the terms of licensing: number of licensing agreements
royalty structure: rate (%) _____ duration _____
base _____ Additional fees: _____
Please specify:

_____

_____

_____

_____

_____

_____

26. Characteristic of technology export

If you have had no technology export so far, this has been because of:

- lack of your interest in entering this field of activity;
- your convinction of your inability to fight eventual competitors;
- lack of relevant technologies;
- lack of the relevant human and financial resources;
- unsucessful attempts to win the contracts;
- others, please specify: _____

_____

_____

PART IV. Technology Exports and Company Development

27. Indirect financial earning associated with technology exports/provisions of complementary exports of capital and intermediate goods, occasional or continuous supply of management, technical expertise, subsidies from government and financial institutions, others (please, underline as appropriate)

_____

_____

_____

_____

28. Feedback of technology export to domestic technological activity: through additional adaptations, collaboration with foreign firms, etc. (pleease specify).

_____

_____

29. The importance of technology export for the company's market standing, both at home:

unimportant, somewhat important, very important:

and abroad:

unimportant, somewhat important, very important (please underline as appropriate)

PART V. Technology Export and Promotion System

31. Did you receive any help in the technology export project from:

(a) Government promotion system - financial, personnel, etc.

(b) private institutions;

(c) others (please specify and give a brief summary).

32. If help was received, what was the real value of the aid (Decisive, Important, Unimportant, if possible, please give additional explanations).

33. What would you suggest regarding the improvement of the promotional system: i.e., more information, financial aid, financial incentives, others, (please specify your own ideas).

34. What is the possible role of the international organizations: regional UN family, etc.?

35. Are you ready to co-operate with UNIDO/INTIB system?:

(a) on a continuous basis;

(b) on occasional basis;

(c) others

(please give your own suggestions, if possible)

36. If you have any additional comments regarding the technology export activity, please do not hesitate to make it.

Thank you for your co-operation

APPENDIX 2

BACKGROUND AND COMPARATIVE STATISTICS

Table 1
BASIC INDICATORS

	Population (Millions) (Mid-1981)	GNP Per Capita Dollars 1980	GNP Per Capita Average Annual Growth (Percent) 1960-80	Adult Literacy Rate (Percent) 1977	Life Expectancy at Birth (Years) 1980	Average Growth Rate (Percent) GDP 1979-80	Industry 1970-80	Manufacturing 1970-80	Energy Consumption per capita (kg. of coal equivalent) 1960	1979
EGYPT	39.8	580	3.4	44	57	7.4[2]	6.8[2]	8.0[2]	283	539
PAKISTAN	82.2	300	2.8	24[1]	50	4.7	5.2	4.0	132	209
IRAN	38.8	2,160[1]	7.9[1]	50[1]	59	2.5	4.0[4]	16.1[4]	257	1,141
TURKEY	44.9	1,470	3.6	60	62	5.9	6.6	6.1	250	771
ISRAEL	3.9	4,500	3.8	88[3]	72	4.1	5.3[4]	6.1[4]	1,204	3,513
GREECE	9.6	4,380	5.8	N.A.	74	4.9[2]	5.3[2]	6.4[2]	407	2,164
SAUDI ARABIA	9.0	11,260	8.1	16[1]	54	10.6	10.2	6.5	674	1,984
IRAQ	13.1	3,020	5.3	N.A.	56	12.1	13.6	14.4	473	664
KUWAIT	1.4	19,830	-1.1	60	70	2.5	-1.8	9.2	10,083	6,159
SUDAN	18.7	410	-0.2	20	46	4.4	3.1	1.3	52	133
LIBYA	3.0	8,640	5.2	50[2]	56	2.2	-2.3	18.9	238	2,254

Source: World Bank, World Development Report, 1982 and earlier issues.

[1] 1978.
[2] 1970-79.
[3] 1975.
[4] 1970-78.

Table 2

STRUCTURE OF PRODUCTION

	GDP (Millions of $)		Distribution of GDP (Percent)								Gross Domestic Investment		Value Added in Manufact. (Mill. of '75$)		Gross Manufacturing Output per Capita (Mill. of 1975 $)	
			Agriculture		Industry		Manufacturing		Services							
	1960	1979	1960	1980	1960	1980	1960	1980	1960	1980	1960	1980	1970	1979	1970	1978
EGYPT	3,880	22,970	30	23[2]	24	35[2]	20	28[2]	46	42[2]	13	31	1,835	3,597	208	--
Pakistan	3,500	21,460	46	32	16	24	12	16	38	44	12	18	1,492	2,056	60	--
Iran[3]	4,120	69,170	29	9	33	54	11	12	38	37	17	30[4]	2,601	7,030	243	—
Turkey	8,820	53,820	41	23	21	29	13	21	38	48	16	27	3,678	6,386	202	401
Israel	2,030	15,340	11	5	32	36	23	24	57	59	27	24	--	33,629	--	--
Greece	3,110	35,650	23	16	26	32	16	19	51	52	19	28	2,540	4,588	770	1,346[5]
Saudi Arabia	—	115,430	--	1	--	78	--	4	--	21	--	26	1,726	3,058	--	--
Iraq	1,580	38,810	17	7[2]	52	73[2]	10	6[2]	31	19	20	33[2]	522	1,442[3]	124	—
Kuwait	--	27,290	--	--	--	79	--	6	--	21	--	11	367	852	685	966[5]
Sudan	1,160	7,190	--	38	--	14	--	6	--	48	12	12	266	274	54	--
Libya	310	32,090	--	2	--	72	--	4	--	26	--	25	154	677	165	--

Source: World Bank, World Development Report, 1982, World Bank Atlas, 1980, and earlier editions of both.

[1] Sub-sector of Industry.

[2] 1979.

[3] 1977, unless otherwise indicated.

[4] 1976.

[5] 1977.

TABLE 3
STRUCTURE OF MERCHANDISE EXPORTS BY COMMODITY

(In percentages)

	Fuel, Minerals & Metals		Other Primary Commodities		Textiles & Clothing		Machinery & Transport Equipment		Other Manufactures	
	1960		1960		1960		1960		1960	
EGYPT	4	47	84	33	9	15	--	1[1]	3	5
Pakistan	0	7	73	37	23	40	1	2	3	14
Iran	88	95[1]	9	2[1]	0	2[1]	0	0[2]	3	1
Turkey	8	6	89	66	0	19	0	2	3	7
Israel	4	2	35	18	8	7	2	12	51	61
Greece	9	21	81	33	1	17	1	4	8	25
Saudi Arabia	95	100	5	0[1]	0	0[3]	0	0[1]	0	0[1]
Iraq	97	99[1]	3	1[1]	0	0[2]	0	0[2]	0	--
Kuwait	N.A.	94	--	1	--	--	--	2	--	3
Sudan	0	4	100	96	0	--	0	0	0	--
Libya	100	100	0	--	0	--	0	--	0	--

Source: World Bank, World Development Report, 1982, and earlier editions

[1] 1978.

[2] 1976.

[3] 1977.

Table 4
DESTINATION OF MERCHANDISE EXPORT
(In percentage)

Countries	Industrial Market Economies		Developing Countries		Nonmarket Industrial Economies		Capitol Surplus Oil Exporters	
	1960		1960		1960		1960	
EGYPT	26	73	39	19	33	7	2	1
Pakistan	56	36	38	47	4	3	2	14
Iran	62	69	34	30	3	0	1	1
Turkey	71	60	17	21	12	15	--	4
Israel	76	80	23	20	1	--	0	0
Greece	65	59	13	23	21	7	1	11
Saudi Arabia	74	78	26	22	0	0	0	--
Iraq	85	61	14	39	1	--	--	--
Kuwait	91	78	9	18	0	0	0	4
Sudan	59	42	29	37	8	9	4	12
Libya	67	84	26	16	7	--	0	--

Source: World Bank, World Development Report, 1982, and earlier editions.

Table 5

DOLLAR VALUE AND DESTINATION OF MANUFACTURED EXPORTS (PERCENTAGE OF TOTAL)

	Value of Manufactured Exports (Millions of $)		Industrial Market Economies		Developing Countires		Non Market Industrial Economies		Capital Surplus Oil Exporters	
	1962	1979	1962	1979	1962	1979	1962	1979	1962	1979
EGYPT	88	373	-	36	-	12	-	48	-	4
Pakistan	97	1,140	45	57	52	30	1	7	2	6
Iran	33[1]	597[2]	64[1]	82[2]	28[1]	7[2]	1[1]	6[2]	7[1]	5[2]
Turkey	4	620	73	71	10	22	17	--	-	3
Israel	184	3,654	66	78	32	21	2	1	0	0
Greece	27	1,773	52	66	41	16	4	4	3	14
Saudi Arabia	--	465	--	19	--	75	--	--	--	6
Iraq	5	53	--	1	21	90	--	--	79	9
Kuwait	--	975	--	6	--	49	--	0	--	45
Sudan	--	3	35[1]	65	54[1]	5	0	30	11[1]	0
Libya	--	69	68	62	32	37	0	1	0	0

[1] 1963.

[2] 1978.

Source: World Bank, World Development Report, 1982, and earlier editions.

Table 6

LABOR FORCE

	Percentage of Pop. of working age (15 - 64 years)		PERCENTAGE OF LABOR FORCE IN: Agriculture		Industry	
	1960	1980	1960	1980	1960	1980
EGYPT	55	57	58	50	12	30
Pakistan	52	51	61	57	18	20
Iran	51	52	54	39	23	34
Turkey	55	56	76	54	11	13
Israel	59	59	14	7	35	36
Greece	65	64	56	37	20	28
Saudi Arabia	54	52	71	61	10	14
Iraq	51	51	53	42	18	26
Kuwait	63	52	1	2	34	34
Sudan	53	53	86	72	6	10
Libya	53	51	53	19	17	28

Source: World Bank, World Development Report, 1982, and earlier issues.

Services		Average Annual Growth of Labor Force (percent)		
1960	1980	1960-70	1970-80	1980-2000
30	20	1.9	2.2	2.3
21	23	1.9	2.5	2.9
23	27	2.5	2.6	2.9
11	33	1.4	2.2	2.1
51	57	3.6	2.4	2.1
24	35	(.)	0.6	0.5
19	25	3.1	3.5	2.7
29	32	2.9	2.9	3.2
65	64	7.5	4.1	3.1
8	18	2.2	2.3	2.7
30	53	3.6	3.5	3.0

Table 7

FLOW OF EXTERNAL CAPITAL

Public and Public Guaranteed Medium and Long Term Loans (Millions of $)

	Gross Inflow		Repayment of Principal		Net Inflow		Net Direct Private Investment (Mill. of $)	
	1970	1980	1970	1980	1970	1980	1970	1980
Egypt	302	2,982	247	1,246	55	1,736	-	541
Pakistan	484	1,199	114	363	370	832	31	57
Iran	940	--	235	--	705	--	25	--
Turkey	328	2,222	128	399	200	1,823	58	89
Israel	410	3,106	25	631	385	2,475	40	85
Greece	164	1,587	61	483	103	1,104	50	74
Saudi Arabia	180	526	168	344	12	182	20	3,367
Iraq	63	--	18	--	45	--	24	--
Kuwait	--	--	--	--	--	--	--	436
Sudan	54	749	22	132	32	617	--	--
Libya	--	--	--	--	--	--	139	319[1]

[1] 1979.

Source: World Bank, World Development Report, 1982, and earlier issues.

Table 8

TRADE, RESERVES, AND DEBT

	Merchandise Trade (Mill. of $)		Terms of Trade (1975 = 100)		External Public Debt. Outstanding and Disbursed		Cross International Reserves	
					Millions of $		Millions of $	
	Export 1980	Import 1980	1960	1980	1970	1980	1970	1980
EGYPT	3,046	4,860	92	79	1,644	13,054	165	2,478
PAKISTAN	2,588	5,350	102	74	3,059	8,775	194	1,569
IRAN	13,523	12,247	27	192	2,193	8,251[2]	217	17,205[1]
TURKEY	2,910	7,667	N.A.	91[1]	1,854	13,216	440	3,497
ISRAEL	5,265	7,910	103	73	2,274	12,663	451	4,053
GREECE	5,143	10,531	109	93	905	4,541	318	3,394
SAUDI ARABIA	109,111	30,209	27	165	N.A.	N.A.	670	26,131
IRAQ	26,429	10,500	25	170	274	878[1]	472	N.A.
KUAIT	19,812	11,367	23	171	-	-	209	5,426
SUDAN	543	• 1,616	57	86	308	3,097	22	48
LIBYA	22,795	10,000	31	183	-	-	1,596	14,906

Source: World Bank, World Development Report, 1982, and earlier issues.

[1] 1979.
[2] 1978.

TABLE 9

Public and Private Sectors' Shares in Production
(in millions L.E., at current factor cost)

	1970/1971			1977		
	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total
1-Agriculture	35.5	1065.6	1101.1	85	2756	2841
2-Industry	1494	788.1	2282.1	3330	1597	4927
- mining	(79)	(1.0)	(80)	(616)	(80)	(696)
- manufacturing	(1415)	(787.1)	(2202.1)	(2714)	(1517)	(4231)
3-Electricity	60.3	-	60.3	110	-	110
4-Construction	233.5	21.7	255.2	547	168	715
5-Transportation and communications	176.9	55.7	232.6	562	85	647
6-Trade and finance	173.3	148.2	320.5	560	494	1054
7-Housing	7.9	118.6	126.5	15	140	155
8-Public utilities	10.1	-	19.1	37.5	-	37.5
9-Other government services	797.2	273.1	1070.3	1655	461	2116
Total Production	2988.7	2471	5459.7	6901.5	5701	12602.5
AGGREGATES						
Commodity sectors - agriculture (1) - industry (2-4)	1823.3	1875.4	3698.7	4072	4521	8593
Services sectors (5-8)	368.2	596.6	964.8	1174.5	1180	2354.5
Other Government services (9)	797.2	-	797.2	1655	-	-
Total	2988.7	2472	5460.7	6901.5	5701	12602.5
SHARES OF SECTORAL TOTALS (percentages)						
Commodity sectors	49.3	50.7	100.0	47.4	52.6	100.0
- agriculture	(3.2)	(96.8)	-	(3.0)	(97.0)	100.0
- industry	(65.5)	(34.5)	-	(67.6)	(32.4)	100.0
Services sectors	38.2	61.8	100.0	49.9	50.1	100.0
Other Government services	100.0	-	100.0	100.0	-	100.0
Total	54.7	45.3	100.0	54.8	45.2	100.0

SOURCE: Based on UNCTC, 1982 , p. 19.

Table 10

GROSS VALUE OF INDUSTRIAL PRODUCTION[1]

(LE million, at current prices)

Split years ended June 30	1969/70	'70/71	'71/72	1972	1973	1974 Target	1974 Actual[2]	1975 Target
Spinning and weaving products	468.2	490.9	511.3	525.4	546.9	598.8	595.1	648.9
Public sector	352.8	367.0	380.0	395.9	411.1	439.7	450.2	462.7
Private sector	115.4	123.9	131.3	129.5	135.8	159.1	144.9	186.2
Foodstuffs	438.5	479.0	504 3	518.5	561.0	590.9	611.1	634.6
Public sector	336.6	376.0	398.3	410.0[3]	445.5[3]	451.0[3]	484.1[3]	483.0[3]
Private sector	101.9	103.0	106.0	108.5	115.5	139.9	127.0	151.6
Chemicals	114.4	127.6	131.9	135.1	139.7	167.5	193.3	247.6
Public sector	89.3	96.3	100.0	102.3[3]	101.4[3]	132.0[3]	151.2[3]	206.6[3]
Private sector	25.1	31.3	31.9	32.8	38.3	35.5	42.1	41.0
Engineering products[4]	100.0	117.7	129.0	145.2	141.4	171.0	170.2	194.6
Public sector	76.9	93.1	103.8	118.6	111.4	133.9	135.9	155.0
Private sector	23.1	24.6	25.2	26.6	30.0	37.1	34.3	39.6
Metallurgical products	59.8	82.3	92.3	105.1	102.7	124.9	132.8	208.8
Public sector	54.0	76.0	84.7	98.5	92.7	117.1	120.3	196.8
Private sector	5.8	6.3	7.6	6.6	10.0	7.8	12.5	12.0
Building materials	49.4	54.9	58.3	58.5	62.6	68.4	69.1	85.6
Public sector	40.9	45.6	48.7	49.3[3]	51.6[3]	57.0[3]	56.9[3]	72.0[3]
Private sector	8.5	9.3	9.6	9.2	11.0	11.4	12.2	13.6
Mining products (public sector)	6.0	6.0	6.2	7.1[3]	7.2[3]	7.1[3]	9.1[3]	8.7[3]
Woodworking products (private sector)	32.4	33.6	34.7	36.0	38.6	43.3	41.2	53.8
Leather products (private sector)	19.4	25.4	32.7	39.0	56.8	41.3	61.0	90.5
Total	1,288.1	1,417.4	1,500.7	1,569.9	1,656.9	1,813.2	1,882.9	2,173.1
Public Sector: amount	956.5	1,060.0	1,121.7	1,181.7	1,220.9	1,337.8	1,407.7	1,584.8
percentage	74.2	74.8	74.7	75.2	73.7	73.8	74.8	72.9
Private sector	331.6	357.4	379.0	388.2	436.0	475.4	475.4	588.3

[1] Covers only industries under the supervision of the Ministry of Industry and Mining. Industrial classification is according to supervising organization. Does not cover national defense production, cotton ginning, flour milling, bakery production, tea packing, printing, pharmaceutical production, iron ore mining, or production of rural industries and handicrafts.

[2] Preliminary figures.

[3] Mining products, shown separately here, are included with foodstuffs (e.g. salt), chemicals (e.g., phosphate) and building materials (e.g., lime) in usual classification according to supervising organization.

[4] Includes transportation equipment and other machinery and equipment.

SOURCE: Ministry of Industry and Mining, as reported by Business International [:34]

Table 11

COMPOSITION OF MANUFACTURES EXPORTED FROM EGYPT AND OTHER SELECTED LDCS AND DEVELOPED COUNTRIES IN 1975 (%)

Country	Capital Goods	Consumer Engineering	Clothing & Footwear	Other Clearcut Consumer Goods	Textiles incl. rugs	Standardized Intermediate excl. Textiles	Other and Miscellaneous
Developed Countries	31.8	9.4	2.7	4.0	4.6	24.1	23.3
Developed Countries[a]	12.5	5.8	21.8	9.8	14.9	16.2	19.0
Group I							
Israel	8.9	1.7	6.9	4.1	3.2	6.4	68.8
Greece	5.2	1.3	17.8	3.1	17.3	40.1	15.2
Portugal	9.0	5.9	18.4	2.5	23.0	15.2	25.9
Korea	7.0	5.2	32.4	12.3	15.7	14.7	12.7
Group II							
Spain	23.5	5.6	11.4	8.4	4.6	22.3	24.2
Yugoslavia	25.4	3.1	13.2	5.5	6.1	21.1	25.5
Argentina	18.0	7.8	2.8	4.3	0.3	24.9	41.9
Turkey	2.8	0.5	25.2	2.0	33.6	22.6	13.4
Group III							
Venezuela	0.3	-	-	0.7	2.1	40.3	56.6
Iran	0.7	0.5	10.9	1.0	60.1	6.5	20.3
Morocco	2.4	0.2	26.6	6.4	29.2	20.9	14.4
Philippines	-	0.4	14.1	25.5	8.7	22.2	29.1
Group IV							
Egypt	1.0	0.3	22.0	6.5	47.7	13.6	8.9
India	9.3	1.2	11.2	4.4	30.6	21.0	22.3
Pakistan	2.0	-	7.2	6.4	66.1	13.1	5.2

[a] Countries listed, plus Hong Kong and Taiwan (I), Brazil (II), Malaysia, Tunisia, Columbia and Ivory Coast (III), and Bangladesh (IV).

Source: Chenery and Keesing (1978), p. 31, as reported by O'Brien and Monkiewicz (1981), p.25.

Table 12

IMPORTANCE OF COTTON LINT PRODUCTION AND EXPORTS IN SELECTED DEVELOPED AND DEVELOPING COUNTRIES (1977)

Country	GNP Per Capita (US$)	Cotton Lint Production (US$1,000)	Lint Production (as a % of GNP	Lint Exports (US$1,000	Lint Exports (as a % of total exports
EGYPT	340	1,316,367	10.2	465,876	27.3
Sudan	330	360,947	6.4	377,852	57.3
Iran	2,060	271,224	0.4	106,996	0.5
Turkey	1,110	799,477	1.7	209,100	11.9
Argentina	1,870	233,257	0.5	88,244	1.6
Brazil	1,410	653,692	0.4	40,894	0.3
Mexico	1,160	499,520	0.7	182,831	4.0
India	160	1,449,600	1.4	12,000	0.2
Pakistan	200	834,878	5.5	37,543	3.2
U.S.A.	8,750	4,946,790	0.3	1,536,124	1.3

Source: Lepkowski and Weiss, 1980.

Table 13

COTTON YARN AND FABRIC MANUFACTURE AND EXPORTS IN DEVELOPING COUNTRIES (1977)

Country	GNP Per Capita (US$)	Manufacture of Yarn & Fabric (US$1,000)	Manufacture as a % of GNP	Exports of Yarn & Fabric (US$1,000)	Exports as a % of Total Exports
EGYPT	340	1,744,353	13.5	238,245	13.9
Hong Kong	2,620	1,029,686	0.9	328,755	3.4
India	160	6,756,730	6.7	341,827(a)	5.4
Pakistan	200	706,601	4.7	271,082	22.8
Argentina	1,870	223,255(c)	0.5	24,574	0.4
Mexico	1,160	612,349	0.8	60,900	1.3
Turkey	1,110	1,193,578	2.6	160,746	9.2

(a) Excludes handloomed fabric.
(b) Yarn only.
(c) Fabric only.

Source: Lepkowski and Weiss, 1980.

APPENDIX 3

GOFI Companies

PRODUCTION, EXPORTS AND EMPLOYMENT
EGYPTIAN COMPANIES AFFILIATED WITH
THE GENERAL ORGANIZATION FOR INDUSTRIALIZATION

CASE	CODE	1975 PRO-DUCTION	1975 EXPORTS	1979 PRO-DUCTION	1979 EXPORTS	1980 PRO-DUCTION	1980 EXPORTS	1980 EMPLOYEES
FOOD IND.								
1	111	9,349	881	20,434	3,420	23,864	3,072	3,570
2	112	8,067	1,377	16,513	6,203	14,730	5,214	4,480
3	121	86,244	21,705	109,147	20,167	166,314	19,762	21,190
4	122	6,798	122	14,900	245	19,116	132	3,180
5	123	7,327	72	17,251	146	22,128	90	3,500
6	124	10,624	0	26,711	0	35,438	0	3,710
7	131	8,855	79	9,825	0	11,626	0	1,890
8	132	8,127	6	11,423	0	13,130	0	1,600
9	141	4,279	0	17,577	0	23,660	0	2,490
10	142	8,891	0	25,974	0	24,886	0	2,100
11	143	7,159	469	23,353	673	25,282	1,596	950
12	144	5,673	2,555	7,105	0	7,982	2,938	900
13	151	202,096	185	354,012	1,396	428,900	1,182	9,020
14	152	88,381	199	88,381	892	71,466	1,404	5,484
15	161	77,489	0	17,868	63	21,704	0	2,000
16	162	21,824	140	29,212	206	35,308	262	4,370
17	163	10,265	299	15,903	401	18,302	402	2,190
18	164	28,263	95	36,134	186	39,560	0	5,175
19	165	9,134	66	13,743	0	17,140	0	2,370
20	166	13,777	166	22,390	116	27,752	108	3,960
21	167	7,945	0	16,868	0	21,478	146	2,200
INDUSTRY		630,567	28,416	894,724	34,114	1,069,766	36,308	86,329
TEXTILE IND.								
22	211	2,653	0	4,045	0	4,986	116	390
23	221	19,935	0	20,019	7,274	27,196	2,954	14,170
24	222	12,105	2,617	33,102	7,235	39,658	21,916	8,970
25	223	22,331	5	26,905	0	34,726	0	9,100
26	224	9,911	3,596	17,331	10,127	26,720	8,480	6,450
27	225	12,437	10,595	17,659	11,850	22,392	14,374	7,510
28	226	5,660	888	10,539	2,642	15,623	5,128	6,300
29	227	16,454	2,425	29,474	6,842	36,110	11,516	11,990
30	228	10,596	58	6,838	268	8,708	0	2,754

CASE	CODE	1975 PRO-DUC-TION	1975 EXPORTS	1979 PRO-DUC-TION	1979 EXPORTS	1980 PRO-DUC-TION	1980 EXPORTS	1980 EMPLOYEES
31	229	0	0	13,794	0	16,258	0	7,050
32	230	1,270	238	7,668	290	10,356	380	3,926
33	231	38,922	3,604	56,454	12,757	64,482	14,348	23,800
34	232	2,267	0	4,098	0	4,742	0	1,790
35	233	23,905	2,508	35,044	3,969	41,976	6,044	10,220
36	234	7,365	629	12,455	130	15,726	88	5,620
37	235	13,172	7,172	25,250	19,077	31,386	22,172	7,340
38	236	4,087	137	10,264	454	11,938	682	7,110
39	237	15,291	965	39,237	0	45,882	3,312	14,440
40	238	15,405	1,270	17,699	1,327	23,436	2,052	6,810
41	239	4,873	0	19,709	1,604	23,076	1,936	10,020
42	240	12,109	4,920	19,862	6,169	24,502	5,136	11,800
43	241	23,590	1,027	37,778	6,470	43,456	5,626	7,150
44	242	18,851	0	27,833	1,324	35,180	2,788	9,120
45	243	75,666	16,594	148,394	41,686	169,664	47,652	31,950
46	244	15,140	5,881	78,527	18,977	95,110	26,110	24,510
47	245	39,150	4,281	40,782	6,321	49,552	6,152	18,240
48	246	13,648	15,891	17,842	23,831	20,994	22,386	9,830
49	271	10,470	1,624	19,509	1,822	25,994	972	8,090
50	272	24,633	0	33,253	0	37,898	0	6,750
51	291	4,558	414	11,369	105	14,012	98	920
INDUSTRY		476,454	87,339	842,733	192,551	1,021,739	232,418	294,120
CHEMICAL IND.								
52	311	2,824	0	3,853	0	4,228	0	1,815
53	312	0	0	10,256	0	39,298	570	1,780
54	313	11,783	0	13,577	0	12,752	0	2,680
55	314	5,674	18	8,916	0	8,462	0	2,550
56	315	1,345	0	14,396	0	11,418	0	2,400
57	316	38,672	74	52,884	2,588	71,590	3,216	5,600
58	321	15,661	0	9,473	0	14,098	26	630
59	322	7,817	0	16,923	0	19,888	0	3,150
60	323	1,562	0	2,168	481	4,830	512	1,750
61	331	6,706	276	12,995	108	17,610	148	950
62	332	3,894	794	5,273	800	4,586	1,220	1,400
63	341	5,816	3	14,196	0	16,838	0	2,460
64	342	7,966	3	17,450	0	20,170	126	2,550
65	351	4,761	0	5,299	0	7,074	0	2,500
66	352	14,650	85	19,350	444	29,358	246	2,400
67	361	3,997	0	5,905	0	4,978	0	1,560

CASE	CODE	1975 PRO-DUC-TION	1975 EXPORTS	1979 PRO-DUC-TION	1979 EXPORTS	1980 PRO-DUC-TION	1980 EXPORTS	1980 EMPLOYEES
68	371	3,884	0	3,175	1,105	4,120	0	1,430
69	372	3,721	0	3,923	1,254	3,822	0	680
70	381	0	0	18,729	0	21,380	0	2,880
71	382	0	0	9,732	0	15,116	0	2,450
72	383	0	0	2,644	0	2,554	0	1,100
73	384	9,540	0	18,074	0	23,244	0	2,620
74	385	11,440	58	9,895	35	18,770	0	2,940
75	391	3,314	0	5,010	0	4,676	568	1,630
76	392	0	0	1,147	0	1,780	0	390
77	393	5,355	0	11,847	294	13,446	1,322	2,434
INDUSTRY		170,342	1,311	297,090	7,109	396,086	7,954	54,729
METALLURIGICAL IND.								
78	421	12,782	36	20,191	100	26,660	0	1,460
79	422	9,710	0	31,152	0	7,908	0	2,610
80	423	58,419	4,851	111,797	8,106	174,930	12,560	26,090
81	424	13,513	0	24,925	0	25,918	0	3,870
82	425	25,680	19	38,990	56	43,256	0	6,600
83	426	0	0	76,208	69,473	82,952	85,514	6,810
84	441	4,744	1,189	4,070	0	5,884	0	1,770
85	442	5,663	0	6,843	0	36,064	0	2,700
86	455	10,779	247	25,580	658	39,954	438	3,820
INDUSTRY		141,290	6,342	339,756	78,393	443,526	98,512	55,730
ENGINEERING IND.								
87	411	6,645	4,211	17,152	310	20,236	1,340	6,300
88	412	6,783	0	24,052	0	30,600	0	2,700
89	413	8,225	0	13,774	0	13,012	0	3,070
90	414	38,512	12,406	101,193	38,313	81,250	32,500	11,700
91	415	2,747	16	3,025	219	4,048	150	760
92	431	7,318	0	12,245	0	10,074	0	3,280
93	432	5,645	177	10,721	43	11,144	0	3,848
94	433	3,641	0	5,125	650	5,106	496	2,315
95	434	2,549	0	1,265	0	1,622	0	907
96	451	3,102	95	6,076	170	7,735	42	2,090
97	452	2,583	3	3,078	0	3,220	126	1,485
98	453	23,407	725	58,781	14,685	68,534	19,404	7,580

CASE	CODE	1975 PRO-DUC-TION	1975 EXPORTS	1979 PRO-DUC-TION	1979 EXPORTS	1980 PRO-DUC-TION	1980 EXPORTS	1980 EMPLOYEES
99	454	3,920	0	9,384	49	10,880	32	2,549
100	456	2,557	0	4,489	0	5,222	382	1,400
101	462	20,200	139	37,449	3,433	46,856	3,590	3,100
102	461	6,976	0	10,708	0	16,294	0	2,400
103	471	2,873	0	21,884	4,997	27,666	8,954	1,890
104	472	6,847	115	13,956	2,894	0	0	0
105	474	5,349	0	17,865	386	0	0	0
106	475	2,824	62	9,399	1,576	12,330	832	2,735
INDUSTRY		162,703	17,949	381,621	67,725	375,829	67,848	60,109
MINING IND.								
107	511	1,533	256	2,733	62	2,974	44	2,216
108	513	4,107	413	1,716	1,595	2,358	2,208	2,340
109	514	0	0	1,148	1,373	2,366	2,366	2,526
110	515	318	0	112	0	178	0	433
111	518	2,004	114	4,647	435	6,570	826	1,540
INDUSTRY		7,962	783	10,356	3,465	14,446	5,444	9,055
REFRACTORY IND.								
112	521	8,419	932	18,882	214	21,376	30	6,700
113	522	2,045	11	2,301	8	2,718	0	1,533
114	523	2,397	2	3,170	61	4,118	26	1,490
115	524	4,189	0	7,723	0	9,594	0	2,430
INDUSTRY		17,050	945	32,076	283	37,806	56	12,153
TOTALS		1,606,368	143,085	2,798,356	383,640	3,359,198	448,540	572,225

NOTE:
Production and Export data are in LE '000.

Chart 1

PRODUCTION AND EXPORTS

GOFI COMPANIES

(IN THOUSANDS OF EGYPTIAN POUNDS)

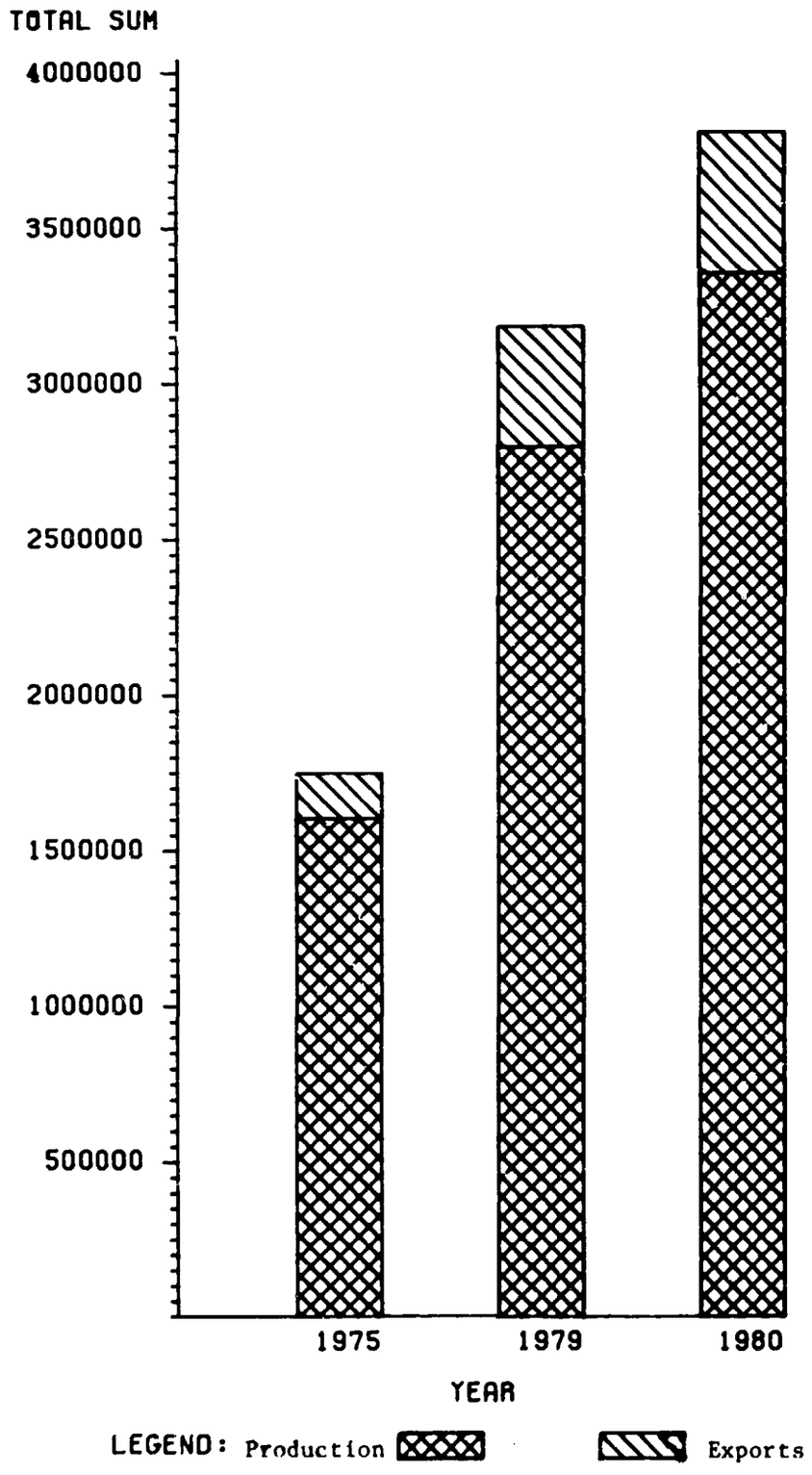


Chart 2

PRODUCTION AND EXPORTS BY SECTOR
GOFI COMPANIES, 1975
(IN THOUSANDS OF EGYPTIAN POUNDS)

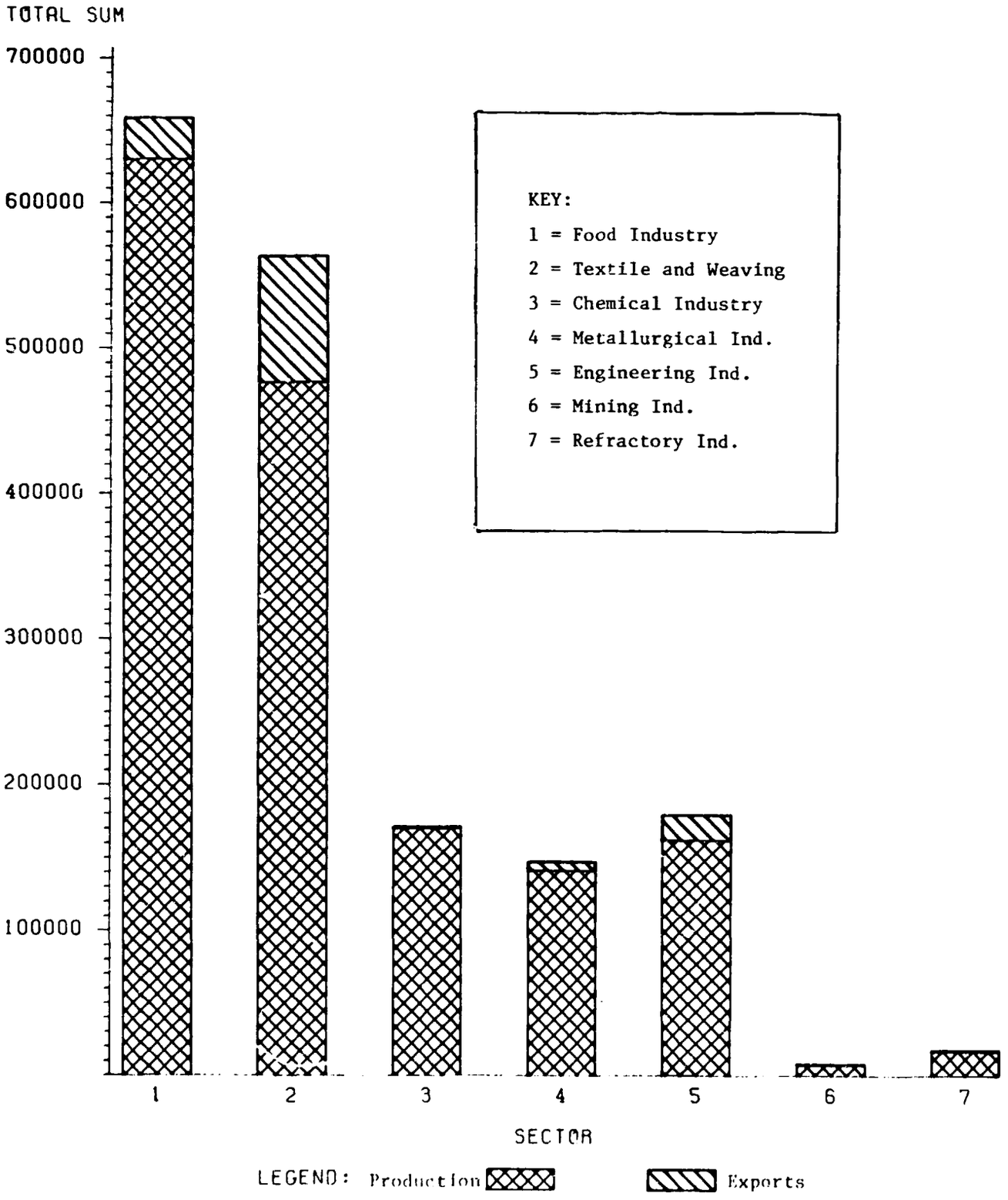


Chart 3

PRODUCTION AND EXPORTS BY SECTOR
GOFI COMPANIES, 1979
(IN THOUSANDS OF EGYPTIAN POUNDS)

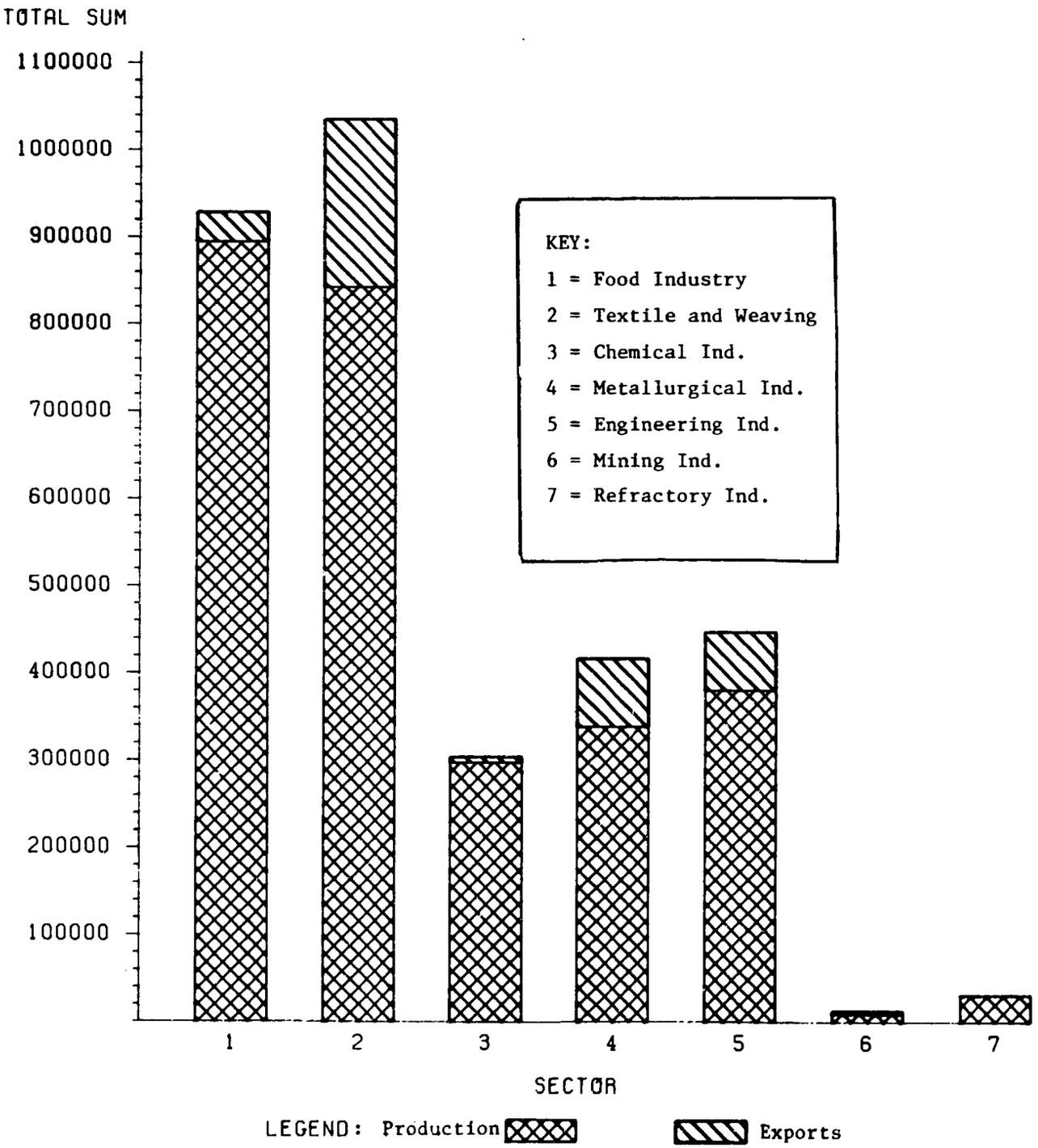


Chart 4

PRODUCTION AND EXPORTS BY SECTOR
GOFI COMPANIES, 1980
(IN THOUSANDS OF EGYPTIAN POUNDS)

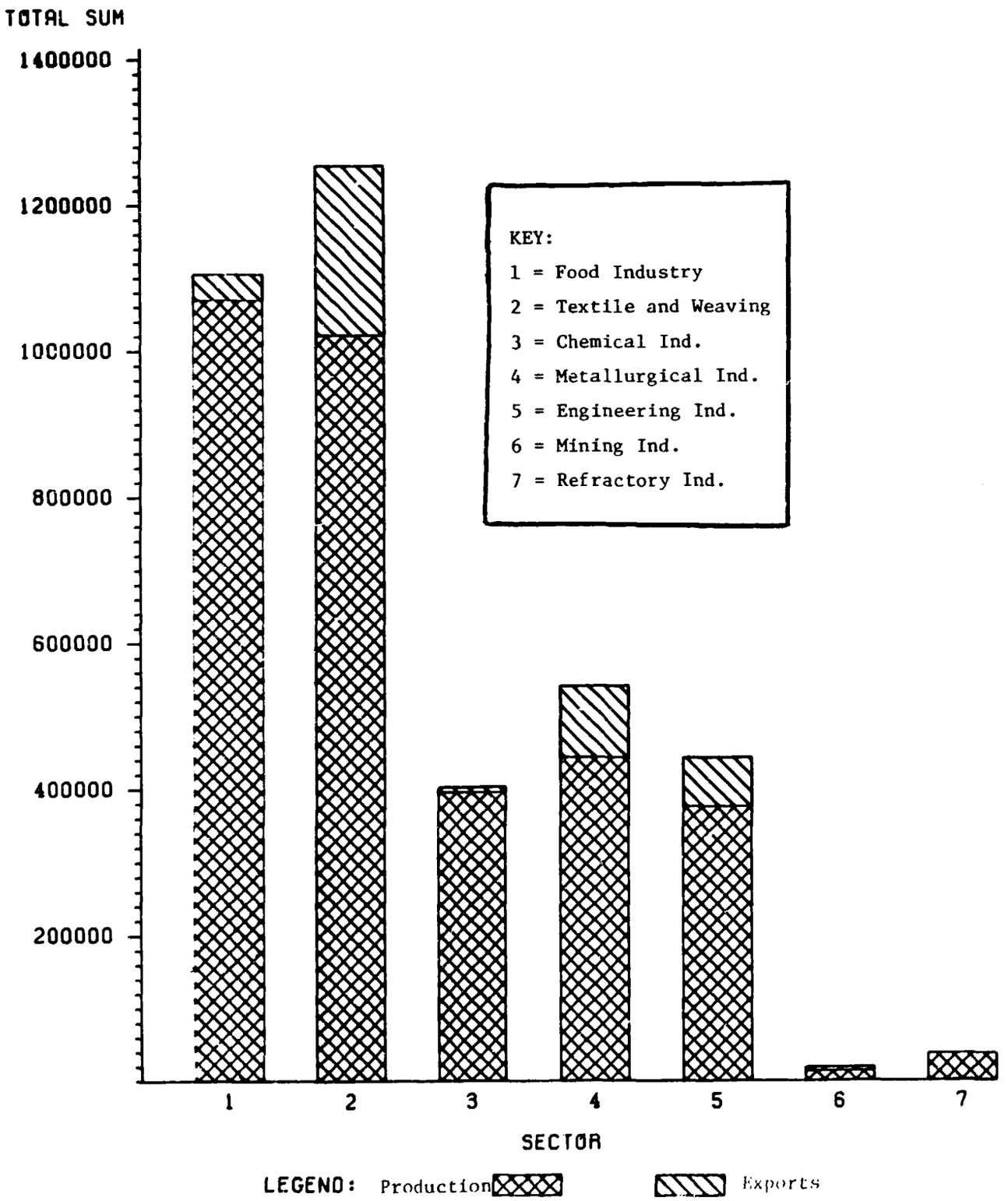
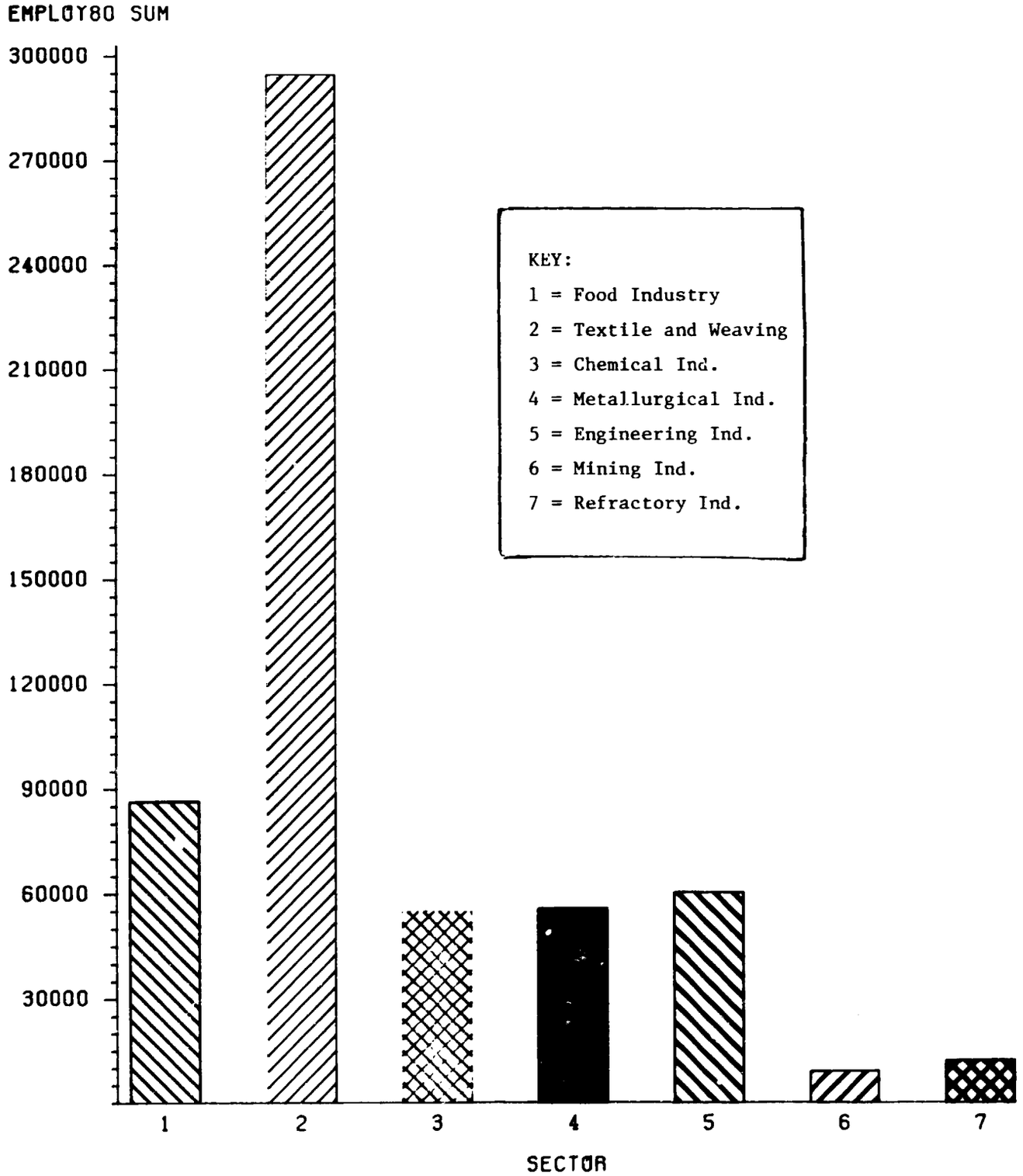


Chart 5

SECTORAL DISTRIBUTION OF EMPLOYMENT
GOFI GOMPANIES, 1980



Bibliography

1. Abdel-Khalek. "The Open Door Economic Policy in Egypt: Its Contribution to Investment and Its Equity Implications". In Kerr and Yassin, eds., (21), pp. 259-283

2. Amin, Galal Ahmad. "External Factors in the Reorientation of Egypt's Economic Policy". In Kerr and Yassin, eds., (21), pp. 285-315.

3. Albin, Eduardo and Katz, Jorge. "From Infant Industry to Technology Exports: The Argentine Experience in the International Sale of Industrial Plants and Engineering Works". (Buenos Aires: Economic Commission for Latin America, IDB/ECLA/UNDP/IDRC Working Paper No. 14, 1978), mimeo.

4. Ayubi, Nazih N. M. "Implementation Capability and Political Feasibility of tne Open Door Policy in Egypt". In Kerr and Yassin, eds., (21), pp. 349-413.

5. Balassa, Bela. "The Changing International Division of Labor in Manufactured Goods". (Washington: World Bank Reprint Series, 114, 1979).

6. Berouti, L. J. "Employment Promotion Problems in Arab Countries". International Labor Review 114:2 (Sept-Oct 1974).

7. Birks, J. S., and Sinclair, C. A. Arab Manpower (New York: St. Martin's Press, 1980).

8. Contractor, Farok J. and Sagafi-nejad, Tagi. "International Technology Transfer: Major Issues and Policy Responses". Journal of International Business Studies, (Fall, 1981), pp. 113-35.

9. B. I. Egypt: Business Gateway to the Middle East? (Geneva: Business International Research Report 74-2, March 1976).

10. Cooper, Charles A. and Alexander, Sidney S., eds. Economic Development and Population Growth in the Middle East (New York: Elsevier for Rand Corporation, 1972).

11. Dahlman, Carl J., and Cortes, Mariluz. "Technology Exports from Mexico as a Starting Point in the Study of Technological Capability". (Washington: World Bank, 1982), mimeo.

12. Dahlman, Carl, and Westphal, Larry. "Technological Effort in Industrial Development. An Interpretative Survey of Recent Research". In Stewart and James, eds., (38), pp. 105-37.

13. Dunning, John H., "Explaining Outward Direct Investment of Developing Countries: In Support of the Eclectic Model". In Kuman and MacLeod (22).

14. Fayez, M.B.E., "A View of the National Technology Policy Required for Egypt" Document NTP/Seminar I/3 in Towards a Technology Policy for Egypt: An International Seminar. (Cairo: Sept. 1981), mimeo.

15. Goulet, Denis. The Uncertain Promise: Value Conflicts in Technology Transfer (New York: IDAC/NA for Overseas Development Council, 1977).

16. Hansen, Bent and Marzouk, G. A. Development and Economic Policy in the UAR (Egypt). (Amsterdam: North Holland Publishing Co., 1965).

17. Hansen, Bent, and Nashashibi, Karim. Foreign Trade Regimes and Economic Development: Egypt. (New York: National Bureau of Economic Research, 1975).

18. Hansen, Bent and Radwan, Samir. Employment Opportunities and Equity in Egypt. (Geneva: I.L.O., 1982).

19. Hussein, Yousef M., "A Summary of Ten Science and Technology Policy Studies in Egypt (1972-1980), "Document NTP/Seminar I/5 in Towards a Technology Policy for Egypt: An International Seminar (Cairo: Oct. 1981).

20. Jequier, Nicholas. Appropriate Technology: Problems and Promises (Paris: OECD, 1976).

21. Kerr, Malcolm H., and Yassin, El Sayed, eds. Rich and Poor in the Middle East: Egypt and the New Arab Order. (Boulder: Westview for the American University in Cairo, 1982).

22. Kumar, Krishna and McLeod, Maxwell, eds. Multinationals from Developing Countries (Lexington: Lexington Books, 1981).

23. Lall, Sanjaya. Developing Countries as Exporters of Technology. (London: McMillan, 1982).

24. "Indian Technology Exports and Technological Development". The Annals of the American Academy of Political and Social Science, 458. (November, 1981), pp. 151-62.

25. Lepkowski, Wil and Charles Weiss, "Cotton Development International" in Charles Weiss and Nicolas Jequier, eds., Technology, Finance and Development, unpublished manuscript, December, 1980.

26. Mabro, Robert. The Egyptian Economy: 1952-72. (London and New York: Oxford University Press, 1974).

27. Mabro, Robert and Radwan, Samir. Industrialization of Egypt 1939-73 Policy and Performance. (Cambridge: Oxford University Press, 1976).

28. Mead, Don. Growth and Structural Change in the Egyptian Economy. (homewood, III.: Irwin, 1967).

29. O'Brien, Peter and Monckiewicz, Jan. "Technology Exports from Developing Countries: The Cases of Argentina and Portugal" (Vienna: UNIDO, 1981), mimeo.

30. Ramesh, Jairam and Weiss, Charles: "Mobilizing Technology for Development" (New York: Praeger, 1979).

31. Ranis, Gustav. "Appropriate Technology: Obstacles and Opportunities". In Samuel M. Rosenblatt, ed., Technology and Economic Development: A Realistic Perspective. (Boulder: Westview, 1979), pp. 23-58.

32. Sagafi-nejad, Tagi; Moxon, Richard W.; and Perlmutter, Howard V.; eds., Controlling International Technology Transfer: Issues, Perspectives and Policy Implications. Book no. 2 in Technology Transfer Trilogy (New York: Pergamon Press, 1981).

33. Sagafi-nejad, Tagi, and Contractor, Farok J. International Technology Transfer. (Lexington: Lexington Books, forthcoming).

34. Sagasti, Francisco R., "Nations (Science and Technology Policies for Development: A Comparative Perspective" in (30), 162-71.

35. Sharkass, Ibrahim Mohamed, and Sayed Abdel Kader, eds., Second International Conference on Technology for Development (Cairo:General Organization for Industrialization, 1982).

36. Serageldin, Ismael; Socknat, James; Birks, Stace; Li, Bob; and Sinclair, Clive. Manpower and International Labor Migration in the Middle East and North Africa. (Washington: The World Bank, 1981).

37. Shibly, M. C. M. "Trade Promotion in Egypt". (Geneva: ITC, 1980), mimeo.

38. Stewart, Frances; and James, Jeffrey; eds. The Economics of New Technology in Developing Countries. (London: Frances Pinter, 1982).

39. UNCTAD, "The Reverse Transfer of Technology: Economic Effects of the Outflows of Trained Personnel from Developing Countries (Brain Drain)", (Geneva: UNCTAD, 1974), mimeo.

40. "Joint Ventures Among Arab Countries". (TP/B/AC.19/R.5). Oct. 1975.

41. "Arusha Programme for Collective Self Reliance and Framework for Negotiations". (Manila: SNCTAD V, 1979), mimeo.

42. Trade and Development Report, 1981. (Geneva and New York: U.N. 1981).

43. UNCTC. "Interregional Study of Technology Transfer in Selected Branches of Capital Goods Manufacture; Country Case Study: Egypt". (New York, United Nations Centre for Transnational Corporations, 1982), mimeo.

44. UNIDO. Conceptual and Policy Framework for Appropriate Industrial Tecnology. Monograph no. 1 on Appropriate Industrial Technology. (Vienna: UNIDO, 1979).

45. UNIDO. Technological Self-Reliance of the Developing Countries: Towards Operational Strategies. (Vienna: UNIDO, Development and Transfer of Technology Series, no. 15, 1981).

46. U. S. Department of Labor. Report of the President on U. S. Competitiveness, Together with the Study of U.S. Competitiveness. (Washington: GPO, 1980).

47. Wahba, W. G., "Technological Information Exchange System (TIES): Investment Policies and Technology Acquisition Strategies in Comparative Perspective", (Vienna: UNIDO. Nov. 1981), mimeo.

48. Wells, Louis T. "The Internationalization of Firms from Developing Countries". In T. Agmon and C. P. Kindleberger, eds. Multinationals from Small Countries. (Cambridge: MIT Press, 1977).

49. Westphal, Larry. "Research on Appropriate Technology". In Industry and Development, 2, (1978), pp. 24-46.

50. World Bank. World Development Report, 1982. (Washington: The World Bank, 1982).