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THE INDUSTRY INSTITUTE, BEIRUT - LEBANON

AIMS AND ACHIEVEMENTS

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## P R E F A C E

On July 1950, the Arab Engineering Conference held its fourth meeting in Beirut at the invitation of the Engineering Associations in Lebanon. The decision taken by the Industrial Coordinating Committee was to establish in every Arab country an institute for scientific and industrial research on lines parallel with that of Fouad I Institute in Egypt (UAR) set up in 1945. This marked the first serious consideration to a quasi-official recommendation for the creation of a national institution to cater for the difficulties and problems of local industries and to cope with questions of development and growth.

The ultimate purpose behind such a recommendation was to establish a permanent scientific centre of specialized knowledge and experience fully able and equipped to gather and develop technical data and information, and offer professional services to industry in the form of economic and technical studies.

Desirous to achieve a rapid economic development, many Arab countries have found the best means is through

industrialization. One reason has been because it offers the fullest and speediest way of increasing the rate of growth. Another reason has been that because industrialization is identified with the concept of progress. Therefore it remains a major aim for Arab countries hoping to raise their levels of income.

Industrialization is a rather complex and strenuous process, and Lebanon is faced with many problems. Yet the country could tap from the rich experience of highly industrialized countries. Lebanon has to maintain an everexpanding large population with small natural resources. The heavy reliance on the services sectors of the economy can prove to be the most harmful and uneconomic in the years to come. Business ingenuity, which has contributed so far to the country's impressive prosperity, is not sufficient.

The use of research studies of Lebanese industries and that of the area is a recognition of the role of research in the development, improvement and survival of our business enterprises in a highly competitive market. It becomes necessary and desirable prerequisite for increasing prosperity and speeding up progress.

For industrialization to achieve its objectives, three types of institutions, among others, must be developed. They are : industrial credit institutions, vocational training centres and industrial research organizations.

An effort will be made to consider one of the most essential institutional prerequisites, and that is the establishment and operation of an industrial research organization - which is the theme of the present thesis. The other two types of institutions necessary for industrial development will be touched upon whenever it is found appropriate.

The analysis of the Industry Institute will cover five chapters. Chapter I is a short survey of the background of the Industry Institute. Its purpose is to acquaint the reader with the economic conditions of Lebanon, with emphasis on the industrial sector and the role of Government in promoting economic development. Then factors which have led to the development of the Industry Institute, namely the Association of Lebanese Industrialists and the United States Operations Mission/Lebanon, are considered.

Chapter II presents the organization of the Industry Institute. It gives the history of the Institute, its aims

and objectives and the facilities it offers. The administration of the research personnel as well as financial management form other subdivisions of the second chapter.

Chapter III embraces studies and research, laboratory testing and analyses, for private concerns as well as for governments, conducted by the Industry Institute. Here the scope of activities of the Institute, divided as to function and locality, is considered through a representative selection of services rendered. This is because the findings are regarded to be the sole property of the sponsors. Confidentiality, however, does impose limitations on the material covered here. Thus, the analysis touches upon projects sponsored for the Government of Lebanon, as well as studies and works for Governments abroad. Some of the major privately sponsored projects are analysed. A short study is presented of the analyses and tests undertaken by the Institute's laboratories for private and governmental sponsors.

A comparative analysis is attempted in Chapter IV : How the Industry Institute figures out in contrast to other systems of management and research of developing countries on the one hand, such as the United Arab Republic and India ; and with those found in the more developed countries such as Japan, the United Kingdom and the United States.

The last chapter, Chapter V, considers the impact of the Industry Institute on industrialization and growth, not only in terms of the economic development of Lebanon, but the

role it plays in Middle East development.

In the Appendix is the original text of the Joint Technical Cooperation Project Agreement between the Technical Cooperation Service for Lebanon, the Lebanese Ministry of National Economy and the Ministry of Agriculture, and the Association of Lebanese Industrialists. Also is appended the Charter of the Industry Institute, 1960 and the Draft Law : Lebanese Standards and Specifications.

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## CHAPTER ONE

### THE BACKGROUND OF THE INDUSTRY INSTITUTE

#### A. INTRODUCTION:-

The purpose of this chapter is to enable the reader to understand where the Industry Institute fits into the economic picture. Thus the economic structure of Lebanon with special emphasis on the industrial sector is analysed.

A brief survey of those institutions which have affected the growth of the Institute, namely the Association of Lebanese Industrialists, the Government of Lebanon through the Ministry of National Economy and the United States Operations Mission to Lebanon(USOM/L) is found to be appropriate at the outset.

#### B. LEBANON'S ECONOMIC STRUCTURE:-

It is not possible, in the absence of accurate national income statistics, to analyse systematically the growth of the Lebanese economy and changes in its structure. Yet a few studies have been undertaken on this subject - though some with a view to propagate the support of a certain economic measure or the championing of a specific policy.

The Lebanese economy has witnessed impressive strides along the path of prosperity in recent years. Economic growth and development - which have been attributed more to the ingenuity of the people of the country than to its physical or material resources - have been remarkable. If per capita

income is to be used as the yardstick of development and standard of living, then Lebanon boasts of a leading position over its neighbouring Arab sister-countries and the majority of Afro-Asian countries. Nevertheless, wide gaps in living standards between various income groups of the population are quite striking in Lebanon.

The figures quoted in Table I on national income reveal certain outstanding features of the Lebanese economy. The trade sector generates by far the largest source of income although more than 50% of the Lebanese population is engaged in one way or another in agriculture. Thus the emphasis on the trade sector and the dominance of services over the production of goods in the national product. The country's poverty in natural resources, the dearth of raw materials and cheap power, coupled with a limited market and lack of developed credit institutions on the one hand and the geographical location among three continents serving as a bridge between East and West, together with freedom

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1. This statement needs, however, some qualification. By United Nations standards, Lebanon still falls within the category of underdeveloped countries (\$.400 and below). On the other hand, Kuwait with such uneven distribution of income per capita, Israel's artificial status propped by a continuous inflow of foreign aid, and the Union of South Africa surpass Lebanon by a margin.

**T A B L E I**  
**NATIONAL INCOME AT FACTOR COST AND**  
**DISTRIBUTION OF WORKING POPULATION, 1950**

S E C T O R S	INCOME (LL.MILL)	%	DISTRIBUTION OF WORKING POPULATION
1. Agriculture	206.5	20	192,000
2. Industry	137.4	13	43,859
3. Construction	41.7	4	2,000
4. Transportation	36.2	4	19,708
5. Trade	285.5	28	50,277
6. Finance	47.4	5	1,572
7. Real Estate	96.0	9	28,756
8. Government	71.8	7	9,931
9. Professional and Other Services	100.2	10	16,734
10. National Income at Factor Cost	1,002.7	8	-
11. Adjustment of Rest of the World	3.6	0	21,163
T O T A L	1,026.3	100	384,000

SOURCES: Col. 1 & 2 A.Y. Badre, "The National Income of Lebanon",  
Middle East Economic Papers, 1956; Economic Research  
Institute, A.U.B., p. 13.

Col. 3 - \_\_\_\_\_, National Income of Lebanon  
Mon. 1 - 7, Economic Research Institute, A.U.B.,  
1954, mimeographed.

of trade and exchange, encouraged the population to play the role of a middleman with strong trade and financial links throughout the world.

In addition, Lebanese agriculture is not as income-producing as agriculture is in countries where agriculture is industrialised, e.g. Denmark or New Zealand, and it is far less income-producing than in predominantly agricultural countries, e.g. Cuba or Turkey. Such large proportion of income arising from the production of services - trade, transport, finance and insurance - is a pure reflection of the character of the economy and is directly associated with Lebanon's role as a trading, finance, and tourist centre.

If the economic orientation of Lebanon towards the trade and services sectors has helped the country's overall growth it has helped, on the other hand, spread wealth. As a matter of fact the net national product by distributive shares, as Table II on distribution of income demonstrates, roughly stood as follows in 1950 : 58% profits and interest, 30% salaries and wages and 12% rent. The trade and services sectors, are more highly developed than the other sectors : in their efficiency, their credit and banking institutions, and their income level.



**T A B L E II**  
**DISTRIBUTION OF INCOME OF ACTIVE POPULATION, 1950**  
 ( IN L. L.)

INCOME BRACKETS	ACTIVE POPULATION ENGAGED IN (THOUSANDS)										Cumulative % From Low Income Up
	Produc. Of Goods		Produc. Of Services		Government		TOTAL				
	No.	%	No.	%	No.	%	No.	%	No.	%	
Under 1000	70	30	•	•	•	•	•	•	70	20	20
1000 • 1999	120	53	35	37	15	60	170	49	170	49	69
2000 • 2999	36	16	17	18	•	•	53	15	53	15	84
3000 • 3999	•	•	4	4	•	•	4	1	4	1	85
4000 • 4999	•	•	6	7	•	•	6	2	6	2	87
5000 & Over	2	1	32	34	10	40	44	13	44	13	100
T O T A L	228	100	94 <sup>x</sup>	100	25	100	347	100	347	100	

<sup>x</sup> Not Including 7,000 engaged in transportation sector and services rendered directly to consumers.

**SOURCE :**

A.Y. Badre, National Income of Lebanon Monograph, Economic Research Institute, A.U.B. 1954, mimeographed.

1. Importance of the Industrial Sector:

The industrial sector generates the third largest element of the total national income of the country. There are more than 1861 industrial establishments with total net invested capital in excess of L.L. 155 millions and engaging about 11% of the working population as opposed to almost 50%<sup>2</sup> in agriculture. But the majority of industrial establishments are small with more than half of them employing less than nine persons.

Number of Industrial Establishments	1861
Employing 5 to 9 persons	1031
Employing 10 to 24 persons	581
Employing 25 to 49 persons	149
Employing 50 to 99 persons	60
Employing more than 100 persons	40

- 
2. Industrial Census, 1955, Beirut, E.R.I., 1957, p.8. The 1861 industrial establishments, with 5 workers and above, are only those covered by the Census out of total estimates set by the Ministry of National Economy at about 10,400. The figure produced by Doxiadis Associates, on the other hand, sets the number of industrial establishments, including handicrafts, close to 20,000 employing more than 49,000 workers. These figures, at best, represent no more than rough personal estimate by the Doxiadis team and therefore should be discarded as unreliable.

The manufacturing industries of Lebanon are largely dominated by light industries. Food-processing and textile industries, in fact, generate between them 45% of the income arising in manufacturing. The other leading industries are nonmetallic - e.g. furniture, tobacco and printing industries. Other industries developed largely from traditional handicrafts, the chief among these at present are carpentry, tailoring, shoe-making, knitting, basket-making and pottery - the small size, family-type enterprises are prevailing.

During World War II, industrialists invested their capital in renewing inventories and establishing new enterprises. The lack of imports coupled with the larger expenditures and consumption needs of the allied armies occupying the country, together with considerable war profits and accumulated reserves contributed to a rapid expansion (primarily after the War) in existing productive facilities. Industries, especially those whose raw materials were available in Lebanon or the region, enjoyed exceptional protection and thus earned higher profits than previously.

Unfortunately, the lack of high protective policy, and therefore the revival of imports, the free exchange policy, the low quality of local products compared with the imported

ones, limited markets, coupled with relatively backward technology and low levels of technical skills, the dearth of raw materials and undeveloped industrial credit institutions made it the more difficult for many of the 'war grown' industries to stand up to the competition from abroad.

Those industries which enjoyed during the War favourable terms collapsed and the remaining ones, as shown in Table III, continued to operate at levels far below normal capacity. Thus it was apparent that in many cases industries were producing at 50% capacity, and in some cases at less than 30% of capacity. They were operating in a market where similar, yet higher quality imported manufactured products, were preferred by the majority of consumers.

## 2. The Role of Government In Promoting Economic Development:

Lewis comments on government initiative thus : "The behaviour of governments plays as important a role in stimulating of entrepreneurs, or parents, or scientists, or priests ... No country has made economic progress without positive stimulus from intelligent governments, least of all England, the foundations of whose greatness as an industrial power were laid by a series of intelligent rulers; and whose

**T A B L E III**  
**PLANT CAPACITY, PRODUCTION AND DOMESTIC CONSUMPTION**  
**OF MAJOR INDUSTRIES, 1949**

INDUSTRY	UNIT	PLANT CAPACITY	AVERAGE ANNUAL PRODUCTION	DOMESTIC CONSUMPTION
Food	Tons	73,860	17,600	34,250
Beverages	Thousand Litres	18,000	4,450	3,800
Textiles	Tons	16,670	5,400	6,385
Wood & Cork	Cubic Metres	160,000	56,000	80,000
Beauty Products	Tons	18,000	6,500	6,000
	Thousand Litres	450	100	250
Tanneries	Tons	5,000	2,500	2,000
Construction	Tons	302,000	255,000	250,000
Metal Works	Tons	9,000	3,571	5,100

SOURCE: Compiled privately from the Association of Lebanese Industrialists records, Beirut, 1960.

governments have always played a large part in shaping economic activity ... Sensible people do not get involved in arguments about whether economic progress is due to government activity or to individual initiative, they know that it is due to both, and they concern themselves only with asking what is the proper contribution of each.<sup>3</sup>"

It will be only fair, at this stage, to enumerate some of the steps and measures taken by the Lebanese Government in an attempt to alleviate the grievance of industrialists and contribute to the general industrial movement.

The persistent efforts, in collaboration with the Association of Lebanese Industrialists and United States Operations Mission (USOM/L), to establish a centre which could serve the purpose of spreading out techno-economical information and managerial services through research, testing and analysis culminated, in 1953, in the setting up of the Industry Institute. The Government of Lebanon, however, has contributed the land on which the Institute's premises were established, backed it financially, and still continues to be one of its major sponsors.

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3. W. Arthur Lewis, The Theory of Economic Growth, London, George Allen & Unwin, 1957, p. 376.

In 1946, the Government attempted to regulate and shape employer-employee relations through the Labour Code and it has done so adversely. It was guided by imported Western notions of social security and ideal standards of industrial behaviour, without itself assuming or sharing in the financial burden. As Mills concludes on this, "Indeed, the Labour Code can be held to be one of the most <sup>4</sup> important factors retarding the growth of Lebanese industry."

During the same year the Institute was initiated, two important measures were taken by the Government : the signature of a multilateral Arab Trade Agreement and the licensing of the importation of machinery. The latter was designed to control purchase of secondhand equipment and tools, and as a second objective to prevent the entry of machinery whose industries were suffering overcapacity, especially the textile industry. Although new machines and equipment by themselves do not always bring about economic efficiency, yet that policy led to more political discrimination and favouritism instead of efficacious well studied decisions. While the multilateral Arab Trade Agreement gives a preferential tariff reduction of 25 - 50% on products manufactured in Arab countries, it certainly falls short of what is actually taking place within the European Common Market, despite political and language barriers and differences in interests.

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4. Arthur E. Mills, Private Enterprise in Lebanon, Beirut, American University of Beirut, 1959, p.133.

The Government, in 1954, exempted new companies from the payment of income tax during the first six years of their operation.<sup>5</sup> The main objective behind such policy was to encourage creative activities and the introduction of new lines of products. On the other hand, several concerns introduced new lines of products and original ideas but did not qualify for tax exemption as the paid-up capital could not be secured easily. Furthermore, the formation of corporate enterprises and largescale undertakings did not fall on fertile ground, as the personal form of organization is still cherished among the majority of enterprises.

During the same year, the Government set up, in cooperation with private Lebanese industrialists and bankers, a Banque de Crédit Agricole, Industriel et Foncier to supply agriculture, industry and real estate with medium and long term credit at low interest rates (5%). Although it was an autonomous institution meant as an improvement on the operations and activities of the Société de Crédit Agricole et Industriel au Liban, it could not have been formed without

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5. These had to meet certain conditions, namely, that they should be formed within a five years period from the promulgation of the law; the fully paid-up capital should be above LL 1 million; annual wages and salaries to Lebanese employees should form 10% of the initial capital, i.e., LL. 100.000; that such companies should exploit new fields of economic activity not trodden before by others, particularly in the industrial sector.



Government participation; private capital was reluctant to provide the small capital of LL. 3 million<sup>6</sup>. Yet it was hoped it could augur a new era of agricultural and industrial development : as 2/5 of the loan portfolio went to agriculture, 2/5 to industry and the rest to tourist establishments. For reasons defended purely on costs of operation, the Government rejected the proposal for two separate banks catering for each economic field as advocated by the IBRD expert. Rigidity also faces industrial borrowers, as there is no economic justification behind limiting the amount of the loan to half net yearly income or 35% of mortgaged property. Unlike agricultural loans the maximum ceiling of which is set by the value of the security offered and the purpose of the loan itself. Industrialists again complain that the medium and long term loans are only extended for investment in fixed plant and equipment.

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6. It was only when the Government accepted, in addition to its subscription to 40% of the capital, to guarantee a loan of LL. 25 million at 2% interest from Banque de Syrie et du Liban that local industrialists and bankers joined. Then the capital was raised to LL. 50 million loan, with Government's guarantee, from Banque de Syrie et du Liban. BCAIF signed on May 4, 1960, an agreement with the US Development Loan Fund to lend the former \$ 5 million. The credit, which will enable the bank to aid in the establishment of new industries, will only be used in extending long-term loans to industrialists - International Monetary Fund, International Financial News Survey, June 3, 1960, p. 577.

The Law of Banking Secrecy of September 1956, which was specially aimed at attracting foreign capital to invest in productive undertakings, has failed in its purpose. The political crisis of 1958 demonstrated clearly the mercurial nature of funds this law encouraged. Complementary measures of setting the environmental conditions for industrial undertakings are still lacking. The inflow of capital alone does not bring about industrial development or economic growth.

Finally, the Government has recently started, in collaboration with the Association of Lebanese Industrialists and the International Labour Office, a technical and vocational training centre at Dakwaneh to school and prepare skilled apprentices in the various crafts and industries, besides learning the techniques of shop management. It is too early, however, to judge the operation and activities of such a centre. Yet it is hoped that it will contribute much to the raising of the productivity standards and increasing the efficiency of the average Lebanese labourer, which may result, eventually, in improved quality products and higher incomes accruing to the working class.

C. FACTORS WHICH HAVE LED TO THE DEVELOPMENT OF THE INDUSTRY INSTITUTE:-

1. The Association Of Lebanese Industrialists:

The everincreasing difficulties and backbreaking burdens shared by the majority of industries spurred the formation of an employers' organisation with the objective of protecting the interesrs of industrialists. The Association of Lebanese Industrialists is neither a cartel nor a monopolistic arrangement. It was formally recognized by the Government in 1943. At present it consists of some 254 member-establishments representing a large segment of major industries.

Unfavourable factors far outnumber those encouraging industrialization in Lebanon. One such hindrance is the relative shortage of industrial credit in the country in relation to both land and labour resources. The limited variation in the range, quality and availability of local raw materials, fuel and energy on the one hand and the limited markets on the other, both internal and external, are among the grievances raised by many industrialists.

Lebanon is poor in minerals, except for some thin deposits of iron ore of questionable quality in the central district of the country. It remains a fact, however, that the major industries of the country depend on foreign and Middle East sources for raw materials. Such dependence has been greatly felt when the supply line has been interrupted during

the political crisis in the middle of 1958, when industrialists had to shut down for a considerable period. Industries with a relatively significant cost of transportation suffered most.

The Lebanese producer stands at a great disadvantage with regard to continuous power and cheap fuel. Strangely enough, in a country rich in water resources, harnessing of hydro-electric power stations is not satisfactory and the supply of electric power is not reliable : cuts have raised overhead costs, diminished output and caused many spoilages.

In addition, the narrow domestic market and the limitations of the regional markets curb the growth of present industries and the search for possible new industries in the foreseeable future. Nurkse writes on this point, "It is not difficult to find illustrations on the way the small size of a country's market can discourage, or even prohibit, the profitable application of modern capital equipment by any individual entrepreneur in any particular industry ... In this sense the small market is an obstacle to development generally."

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7. Ragnar Nurkse, Problems of Capital Formation in Underdeveloped Countries, Oxford, Basil Blackwell, 1955, pp. 7 - 8.

Lack of experience, paucity of technical skills, on both the side of labour and management, and low qualifications certainly present themselves as a handicap to industrial development.

The Association of Lebanese Industrialists, conscious of these and many other hurdles which lie in the way of industrialization, has many times pleaded for the establishment of a permanent national scientific centre of specialized knowledge and experience, fully able and equipped to gather and develop technical data and information, offering at the same time professional services to industry. The need for such a centre has come to be fully realized. Industrial establishments in this country are on the whole too small to afford industrial research and extensive market surveys on their own.

## 2. United States Operations Mission/Lebanon:

The idea of giving 'know how' to peoples of less developed countries or help promote 'learning by doing', which is one of the underlying objectives of the Point IV Programme, resulted in a U.S. technical assistance programme to underdeveloped countries whose low standard of living was not the result of war but of more lasting and basic factors which prevented these countries developing continuously and

industrializing reasonably fast.

It is important to bear in mind that Point IV is a programme to help underdeveloped countries help themselves. It is to act as a catalyst in developing these countries and is not a programme which will bring about development all by itself.

The general agreement between Lebanon and the United States, called the Technical Cooperation Agreement, was signed on May 29, 1951, and entered into force on December 13, 1951, when it was ratified by the Lebanese Parliament. It included technical assistance which covered assistance and advice in such basic fields as health, sanitation, communication, road building, government services, survey of resources and planning for long range economic development.

The Industry and Mining Division of Point IV took part in establishing the Industry Institute, as it implemented then rural industrial projects, mainly water supply and power

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8. Aside from the purely humanitarian factor, and that the rich should help the poor, it was believed that a more developed and productive country would be more stable socially as well as politically, and hence could help combat communism in the long run and win friends for the United States (sic.)

transmission, as part of technical assistance and development assistance as well. What USOM/L could possibly do for local industry had led successfully, after long and tedious preparations, to the creation of a centre of industrial scientific research, techno-economic feasibility and testing.

The following table, Table IV, shows the Divisions's allotments, obligations and expenditures on the various projects up to June, 1960. From the beginning of the Operations Mission in Lebanon until 1960, total allotments amounted to about \$ 60 millions. The Mission, however, did not stress development of industry, through technical assistance, as that of agriculture.

If both the technical and development assistance allotments are considered together, then the Industry and Mining allotments surpass that of the Agriculture and Natural Resources by some 487 thousand dollars. But actual expended funds on the development assistance aspect of the Industry and Mining Division amounted to slightly over half of total development assistance allotments, as it was envisaged that the industrial sector had the greatest potentialities for expansion.

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9. In addition to industry and mining, there were the agricultural and natural resources, transportation, labour, health and sanitation, education, public administration and community development divisions, besides the audio-visual department.

T A B L E IV

INDUSTRY AND MINING DIVISION/USOM-L

ALLOTMENTS, OBLIGATIONS AND EXPENSES AS OF JULY 30, 1960

(IN U.S.DOLLARS)

TECHNICAL ASSISTANCE	ALLOTMENTS	OBLIGATIONS	EXPENSES
Industry Insitute	1354422.98	1354422.98	1318788.05
Rest House	5000.-	5000.-	5000.-
Administration of Industry	18907.70	18907.70	18907.70
Administration of Tourism	6050.-	6050.-	6050.-
Promotion of Tourism	5991.28	5991.28	5991.28
Handicraft Cooperation Distribution Centre	12000.-	12000.-	12000.-
Solar Salt	8000.-	8000.-	8000.-
Olive Oil Demonstration Plant	650.-	650.-	650.-
Census of Industrial Establishments	30000.-	30000.-	30000.-
Industrial Management	1858.47	1858.47	1858.47
Improvement of Industrial Practices	5000.-	5000.-	5000.-
Engineering Training-A.U.E	20606.75	20606.75	20606.75
Product Quality Control	9968.35	9968.35	9968.35
Rural Power Transmission	638863.35	638863.35	416390.88
Village Water Supply	937668.36	937668.36	800852.33
General	411725.06	411725.06	398404.29
Total Technical Assistan- ce	3466712.30	3466712.30	3058468.10
Total Development Assis- tance	3992427.24	3992427.24	2028161.73
Grand Total	7459139.54	7459139.54	5086629.83

SOURCE: United States Operations Mission/Lebanon, Controller's Office, F.Copty, August 17, 1960.



## CHAPTER TWO

### THE ORGANISATION OF THE INDUSTRY INSTITUTE

#### A. INTRODUCTION:-

This chapter contains four sections. The first section defines the aims and objectives of the Industry Institute for which it was established; the second section describes the available laboratory facilities and other research services. The following section deals with the administration of research personnel ; the fourth and last section is concerned with financial management.

#### B. AIMS AND OBJECTIVES:-

The general agreement which initiated the Industry Institute was signed in Beirut on March, 1953, by the Technical Cooperation Service for Lebanon and the Lebanese Ministry of National Economy and the Ministry of Agriculture and the Association of Lebanese Industrialists, and became effective as of August 17th, 1955, through Presidential Decree No. 10059, which made the Institute possess the status of a 'public utility'.

The purpose behind the agreement was stated thus :  
"The existing industries, entrepreneurs intending to establish new industries and Government Agencies concerned with the guidance and orientation of Industry, are faced with technical,

production and organizational problems the solution of which requires direct access to a centre with trained personnel and adequate technical facilities.<sup>1</sup>"

Lebanon's historically mercantile economy, it was conceived, prevented the creation of either a national centre or public organization for industrial development to which governmental or private agency could resort for help and guidance. The country's distance from the developed technical and industrial centres, the small size of its industrial establishments and the specific lack of highly trained technicians spurred the setting up of such an institute. Furthermore, the Lebanese economy was unbalanced and ran the risk of having its supply line blocked in an emergency; adjustment could be effected merely by the addition of economically feasible industries.

It was specified that there was then an important segment of the population employed in industry. Yet a large number of workers were unemployed due to the closing down or drastic curtailment of certain industries which had been hurriedly established to meet the country's war economy. The

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1. Joint Technical Cooperation Project Agreement,  
p. 1, March 2, 1953.

project agreement was therefore designed to provide the country with a reliable body of experts to exchange technical knowledge and production methods among specialists of the Technical Cooperation Service, the industries of Lebanon, and university research units and laboratories. Existing industries could be afforded technical advice, and the establishment of healthy industries and adequate methods of production might be promoted (Art. I, 3 & 5).

Moreover, the availability of an industrial institute in Lebanon which would provide such services was envisaged to be an asset. It was contemplated that as the Institute developed in experience and technique it might well become a centre from which Lebanese assistance could be made available to neighbouring countries whose industries shared similar problems (Art. I, 6 & 7).

In the Charter of the Industry Institute, the status was defined as " a Lebanese, non-commercial institution, independent administratively and financially, for industrial studies and research and for scientific testing and analysis and to operate under the supervision of the Ministry of National Economy and possesses the Status of a 'Public Utility'<sup>2</sup>.

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2. Charter of the Industry Institute, 1960 Art. I  
of Chapter One : Status and Purpose of the Institute.

Thus the activities and services of the Institute, as stipulated in Article XXV of the Charter, were organized in such a way as to realize the following aims :

(1) - To conduct studies and research relevant to the establishment of new industries.

(2) - To investigate and disseminate information about available raw materials with a view to defining their uses and establishing the best means for their exploitation.

(3) - To provide specialized technological, management and economic consulting services to existing industries and projects of industrial development.

(4) - To provide, on an international level, reliable services in testing and analysis and to issue certificates of quality or of conformity with standards and specifications.

(5) - To maintain close cooperation with official institutions, industrial organizations and development boards both on the national and international levels, and in all matters relating to the industrial organizations and development boards both on the national and the international levels, and in all matters relating to the industrial development of Lebanon.

C. LABORATORY FACILITIES AND OTHER RESEARCH SERVICES:-

The laboratories, which house technical equipment valued at more than L.L. 1,900,000, ( and plans are under way to increase equipment and laboratory facilities to three millions),

are intended to provide facilities for testing and analysis, for bench-scale and pilot-scale research and development work. These laboratories comprise chemical analysis, electrical engineering, chemical engineering and process, mineralogy and metallurgy, ceramics, leather and textile laboratories. On the other hand, the pilot plant is probably the first unit operations laboratory in the Arab Middle East designed specifically for large-scale investigations on a wide variety of industrial processes. In all, the Industry Institute investments in equipment and total fixed assets (excluding land), from its initiation up to the present, surpassed L.L. 9,200,000.

An extensive and diversified field of activities, from the initial steps of assessing the economic feasibility of the sponsored project and market surveys to managerial consultation on plant operation and technical services, are covered by the Industry Institute. While such services are provided on a cost-incurred basis, in accordance with the principles and scale of fees established by the Board of Directors, yet actual cost and method of payment are defined in a legally binding contract between the Industry Institute and the party for which the services are to be provided.<sup>3</sup>

In economic engineering evaluation, market surveys are undertaken to determine the desirability of the product and the market for it as to quality, taste, price and also its projected competitive status. Critical evaluation is given to the technical soundness of the proposed process determining capacity at the same time. Estimation of the erected-plant cost and calculation of the manufacturing cost of the product are made. Then comes an estimation of the invested capital required and a preparation of projected profit and loss statements.

The Institute provides process designs and plant designs. In the former case, designing processes for maximum profit return, i.e., minimum cost per unit of product and the necessary flow sheets are made. In plant designs, the proper equipment is selected for the job with drawings and specifications being furnished. Under this category comes also designing layout and utilities (water, steam, electricity and air conditioning).

Having secured the above preliminary steps, quotations from many companies are obtained with a view to comparing them and selecting the most applicable, given the existing conditions, and delivery of equipment is scheduled henceforth. The location of the plant, furthermore, is extensively studied to

select the optimum location as to be within easy reach to markets and raw materials. Careful examination is taken of the availability and cheapness of utilities and access to transport facilities, abundance or lack of skilled and cheap labour.

The Institute supervises plant construction and equipment erection. Thus experienced engineers are provided for the supervision of the plant construction and following through with the coordination of the work. In case of highly complex construction questions, the Administration of the Institute will resort to the help of prominent engineers.

Initial plant operation and plant management constitute two of the most basic technical and managerial consultations rendered by the Institute to industrialists of this area. "Know-how" is transmitted to plant personnel by supervising initial operations and this is supplemented by the quality control tests at the various stages of production processes. The Institute further provides assistance on problems of organization, finance, accounting, cost control, production scheduling, inventory control, sales, and other phases of plant management. Production inspection and certification of performance are also provided to conform with standards and purchase specifications.

As an independent consulting and research organization,

the Industry Institute operates under the following basic rules and professional standards :

(1) - To identify itself with the sponsor's (i.e., client's best interest under all circumstances)

(2) - To regard as the sponsor's property any information, process patent, plan or technique developed during work for that sponsor and to safeguard such matters in complete secrecy.

(3) - To decline a project for which the Institute considers itself to be not fully qualified.

(4) - To discontinue a project if the Institute discovers that further work no longer is of effective benefit to the sponsor.

(5) - The Institute does not permit professional staff, members with the purpose of assuming complete freedom from personal bias, to hold governmental or private outside posts, or to retain stock or ownership in profit-making organizations, which are likely in any way to influence their decisions as Institute members.

D. ADMINISTRATION OF RESEARCH PERSONNEL:-

In spite of shortcomings and criticisms that accompan-

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ied the implementation of the first action plan, it was Battelle which set and coordinated such a plan. It was designated to best integrate the resources of equipment, procedures and research staff to produce maximum benefits in the shortest period of time. Battelle had to provide effective management of the Institute and train a Lebanese staff to be integrated as rapidly as possible in preparation for eventual assumption of full management responsibility.

Thus it became paramount for the new administration of the Institute to set the pattern of activity within which each research unit functions. Therefore definition had been made of duties and functions of all persons, professional as well as nonprofessional, in such a way as to avoid friction and overlapping. Although there was a tendency at the start - in an attempt to recruit men of great ability and character - to

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5. Of the two agreement entered into, one dated November 21, 1955, and the second September 7, 1956, between the Industry Institute, Lebanon and Battelle Memorial Institute, U.S.A., the first certainly fell far below expectations. On the one hand the Institute was not technically equipped yet and therefore the team, four in number, was managerial consultants hired from outside the staff of Battelle whose services, despite heavy benefits bestowed upon them, resulted in inappropriate handling of projects, 'transplanting' ideas and 'production' of always new experimented schemes, exogenous to the industrial environmental conditions of the country.

emphasize the need for and the value of extensive academic training in building up a balanced industrial team, yet the Institute staff needed practical industrial experience, adaptability, and skill in analysing problems in addition to technical proficiency. But efforts and capacities could not be directed without due consideration to incentives and reinforced favourable environment conditions.

Presently the Institute has an equitable salary scale, aside from fringe benefits and personal allowances, which provides for maximum and minimum levels (the average monthly remuneration for staff professional researchers stands above LL. 1,200) to allow for status and length of service, seniority advancement as well as initiative. Providing additional stimuli, besides financial rewards, in the form of proper working space, good light, cleanliness, quietude and so forth, was perhaps a minor issue compared to the important one of recognizing merit and highly qualified capabilities. Given the nature of research work, such recognition encourages creativeness, and creative results only make research in industry pay its way.

Of the total sixty-six Institute personnel in 1963, (Department of Finance and Administration, Technology Department and Department of Management and Economics) the professional

staff strength stands at twenty-two, eighteen administrative, seventeen technicians and the rest general. Steps are being taken to increase the professional man-months from 225 to 300. Hertz concludes on recruitment and turnover that, "It is necessary, therefore, that the personnel be retained and given the opportunity to experience satisfaction with their work, with a minimum possible instability in the professional staff structure (and the least turnover in nonprofessional personnel). It should be apparent that turnover of personnel in this type of work is not efficient, especially when it is recalled that the creation of a collaborative working team requires time and careful effort."<sup>6</sup>

E. FINANCIAL MANAGEMENT:

Up till the beginning of 1960 which is the turning point in the financial history of the Institute as it is the first year with a balanced budget presented to the Board - the use of basic budgetary tools were not recognized by the Industry Institute. There were no regularly approved annual budgets. The so-called quarterly 'budgets', (started in October 1956) as required by the terms of the Battelle contract,

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6. David B. Hertz, The Theory and Practice of Industrial Research, New York, McGraw Hill Book Company, Inc., 1950, p. 197.

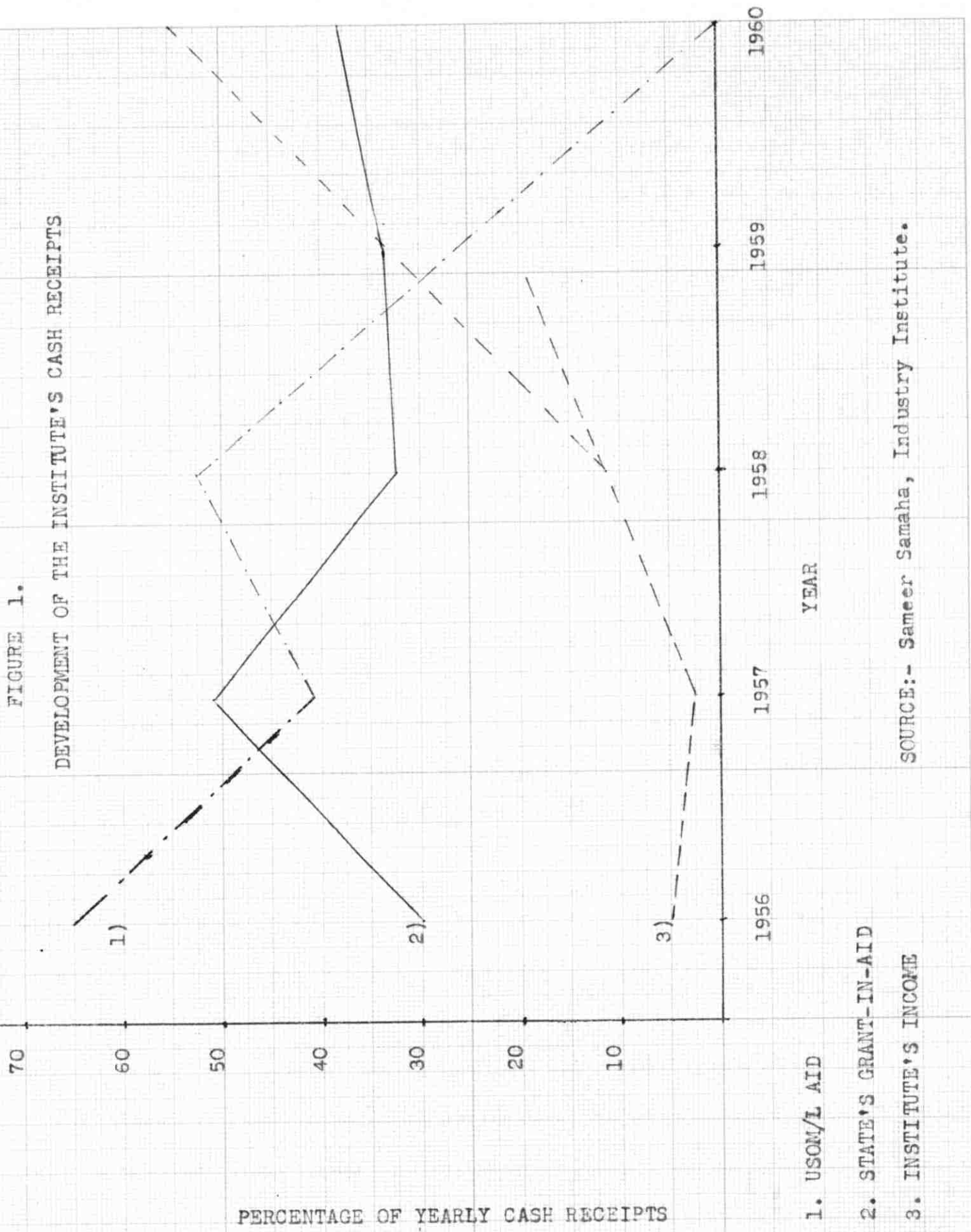
were technically requests for cash release on the basis of a programme fully documented in the proposal. The "annual projection" of 1959 with the purpose of giving advance notice about the global yearly cash requirements and estimated cash receipt was not officially approved by the Board and the system of quarterly budgets remained in effect for the duration of the year.

Only that part of the estimated cash receipts from Institute projects, research and testing activities was registered and that was by far the minor part of those receipts. The other two parts, the State's grant-in-aid (which was granted to the Institute in one lump sum annually) and the United States Operations Mission aid (which was given by virtue of a Project Agreement signed by the Minister of National Economy and the Director of USOM) were not technically appropriated into the quarterly budgets.

The Institute is no more dependent on external aid for balancing its budget. Such need for external aid, other than the State's grant-in-aid (as the graph of Figure I on the

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7. Each Project Agreement had to include a description of the project, its location, results to be obtained, persons or agencies to implement it, portions of funds provided for the project, provisions governing expenditure of funds, employment of technicians and so forth - From a lecture delivered by Hugh Farley, West Hall, A.U.B., 27/3/55.

FIGURE 1.  
DEVELOPMENT OF THE INSTITUTE'S CASH RECEIPTS



SOURCE:- Sameer Samaha, Industry Institute.

- 1. USOM/L AID
- 2. STATE'S GRANT-IN-AID
- 3. INSTITUTE'S INCOME

Development of the Institute's Cash Receipts reveals) has decreased markedly during 1959, to something like 40% of that of 1953, while for 1960 it did not exceed 33% of that of 1959. The State's grant-in-aid, for the years 1961, 1962 and 1963 stood as follows : L.L. 375,000, 375,000 and 275,000 respectively. On the disbursements side, however, in 1956, the percentage of general operating costs covered by Institute income stood at 20% and fell to 16% in 1957, then it rose to 30% in 1958, while approximately half, 48% of the general operating Institute costs were covered by Institute income (projects plus analysis and testing) in 1959.<sup>8</sup>

It still remains true that the overall plan of operation for a research organization during a given period of time may be established by means of a budget. Costs and values of work done are estimated and measured. This single accounting sum represents a budgetary control, and if used with subjective evaluation of results, is the measurement of research accomplishment. But without going at this stage into controversial issues of the impact of research on the studies and projects, the particular industries and the economy as a whole - which will be duly tackled in the last chapter - it can be fairly stated that this type of control is not completely without merit.<sup>9</sup>

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8. Statement of Cash Receipts and Disbursements, Dec. 28, 1959, Industry Institute, Beirut.

9. Ibid.

Before any work is undertaken by the Industry Institute, a proposal is submitted to the prospective client outlining the Institute's understanding and analysis of the problem, the proposed method of attack, with an estimate of time needed and cost involved. Yet the client, whether an industrialist or a businessman, is not so much interested in measuring variance above and below preliminary cost estimates, as he is in estimating progress toward set goals and in determining the nature of the risk taken. Therefore the programme forecast has to partake of the nature of prediction based upon economic and technical judgment. Of course there is no formula which guarantees success in research and analysis: every problem needs separate and special consideration.

## CHAPTER THREE

### THE INDUSTRY INSTITUTE : SCOPE OF ACTIVITIES

#### A. INTRODUCTION:-

It has been found convenient to pick certain projects, studies or research works which, in the mind of the writer, are representative of the different services rendered by the Industry Institute to industry, public institutions and business in general. Furthermore, such selective analysis may throw light on the problems and difficulties facing the Institute. The choice, finally, is guided by the fact that the Institute regards as the sponsor's property any information, processes, patents or techniques developed during work, and therefore are safeguarded in complete secrecy.

The present chapter embraces studies and research, laboratory testing and analyses, for private concerns and individuals as well as for governments. The analysis will touch upon the projects sponsored by the Institute for the Government of Lebanon, as well as studies and works for Governments abroad. Some of the major privately sponsored projects will also be taken, while other industrial surveys and development projects will be duly considered. A rapid study is found necessary of the analyses and tests undertaken by the Institute's laboratories for private and governmental sponsors.

#### B. STUDIES AND RESEARCH:-

Up to the present, about one hundred and seventy five



work studies and research projects, both large and small, have been handled by the Industry Institute. The majority of them have been successfully completed and others are under way. Such studies and research may embrace engineering evaluation and economic feasibility, market research, production management, cost accounting and industrial organization.

1. Projects, Studies And Works For Governments:-

a. Government of Lebanon: The Lebanese Government continues to be one of the major public sponsors in the area, through its ministries, departments and agencies. Within this capacity, the Institute has furnished technical as well as economic consultations to the Government on those technical and industrial subjects which have direct relation to the growth of industries and which are ultimately in the Lebanese economic public interest.

Under a contract with the Lebanese Ministry of Planning, the Institute has conducted an analytical survey of three of the major industries of the country : textiles (cotton, rayon and wool) ; metals and allied industries; canning of fruits and vegetables. The aim behind these surveys was to determine the relationship between

installed capacity and production in the first place, then to find out the degree of self-sufficiency of the local market through local production, and finally to study the competitive position and potential of each industry in relation to the local market and possibilities of exporting.

A report prepared by the Industry Institute<sup>1</sup> in 1956, reveals that failure of Lebanese textile industrialists to compete with foreign competitors, mainly European and American, is due to poor technical methods, lack of proper internal organization and unscientific marketing procedures. Poor performance in most firms is characterized by low productivity, poor maintenance of equipment ; ill-trained and low paid workers; dearth of qualified technicians; lack of cost control and quality control.

Prompted as in the previous study in giving effective help, the Institute has<sup>2</sup> carried out a similar report on food processing in the country. Although a small and unrepresentative fraction of the food-processing industry in Lebanon was considered, yet the study did throw light on the shortcomings

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1. Malouf, Amin, Etude Générale sur l'Industrie Textile au Liban, mim., Industry Institute, Beirut, 1956.
  2. Scheid, W.A., A Study of the Food Processing Industry of Lebanon, mim., Industry Institute, Beirut, 1956.

in technique and management of most of the firms in the industry. Improper preparation of raw material, faulty processing techniques and unsanitary practices all resulted in foreign matter. The introduction and use of automatic equipment removed the responsibility for factors determining quality from labour to machine.

The Industry Institute has undertaken power transmission line design work for the Lebanese Ministry of Public Works for both high voltage and low voltage, to secure continuous and farreaching transmission of electric power to the Metropolitan places which are not electrified yet or those which need increase power.

For the Ministry of Administrative Reform, the Institute has provided management consulting services to develop improved systems and procedures for the registration and licensing of motor vehicles with a view at coordinating organization and systems in the Traffic Department.

So far the Industry Institute has conducted a boiler survey with the aim at establishing a draft boiler and electric distribution codes of practice. The Ministry of National Economy prescribes that every owner of boilers, for industrial or other

purposes, must secure a certificate from the Institute to insure that it is run within the set standards of safety and defined practices of good performance. This has been so in order to eliminate as much as possible occurrences of dangerous explosions or improper handling of pressure valves.

The rest of this section will handle three selected projects in more detail and analysis, and they are : "The Quality of Leather as Affected by Defects in Killing, Flaying and Curing", "Draft Law for a Lebanese Standards Organization", and "Profitability Study of a Salt Refining Plant for Lebanon".  
The Quality of Leather as Affected by Defects in Killing, Flaying and Curing.<sup>3</sup>

Larger losses in the quality and value of local leathers can be attributed to improper killing, flaying and curing practices. Lack of adequate care and control in these processes and operations were responsible for such low quality. As the study points out, major defects resulting from improper killing were : pipy grain, scratches of grain and veininess in the leather. By allowing the animal to rest before killing, by proper bleeding of the animal before flaying, and by handling

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3. The Quality of Leather as Affected by Defects in Killing, Flaying, and Curing, mim. Industry Institute, Beirut, 1957.

the animal and the carcass with care, the occurrence of such defects can be prevented.

Improper flaying resulted in cut hides, scored hides, corduroys, poor patterns and poor trimming. Such defects, which are caused by negligence on the part of the butcher, can be easily minimized by the practice of hoisting the carcass in the flaying operation, thus allowing for better control of the knife in the butcher's hand.

Curing is the operation by which skins are preserved until the tanner receives them and processes them to make leather. Two ways are mentioned of preserving skins; drying in the sun or in the shade, or curing with sodium salt. The way that these operations can be carried out depends upon the geographic location, climatic conditions, types of skins and the economics of the overall situation. Improper curing has been found out to cause the following defects : 'eaten grain', 'sweat', 'cracking', grain, loose grain, pipy leather, 'heat', skin rot, stains and partial damage.

The report concludes by saying that efforts are being made continuously all over the world to improve the quality of skins and hides by greater care and better control.

<sup>4</sup>  
Draft Law for a Lebanese Standards Organization.

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4. See Appendix for the full text of the Draft Law.

If ever this country is to witness a well coordinated industrial development, then a Lebanese organization of standards and specifications becomes vital at this stage. It is well known that much waste and inefficiency are occurring at the various stages of production, distribution and consumption in the economy due to lack of a national standardization programme. True that standards impose similarity in quality, but not in design or form. There are no restrictions on skill, innovation and variety. Compliance with standards and specifications does not mean 'unification'<sup>5</sup>.

The movement of setting standards and specifications in the Arab countries is still in its infancy. Cairo has surpassed other Arab capitals in this connection. The movement started in the Association of Egyptian Engineers before World War II and developed into an official organization in 1957.

In Lebanon, the movement started four years ago at the Industry Institute. The Government requested the Institute to carry out the necessary studies leading towards the establishment of a national system in Lebanon. It became apparent that the subject was so important to the Lebanese and Arab economic future that it required discussion from all its phases on an

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5. From a lecture delivered by Dr. M.D. Attiyah at the 10th Session of the Conference of Arab Chamber of Commerce, Industry & Agriculture, Beirut, Nov. 21-24, 1960.

international level. So the Institute sponsored a Middle East Conference on Standards and Specifications during which the subject was tackled from its various aspects by international experts. Early in 1959 the Institute submitted the results of its study to the Lebanese Government in the form of a "Draft Law for a Lebanese Standards and Specifications Organization", and the project has been enacted by the House of Parliament on 2nd July, 1962.

7

Profitability Study of Salt Refining Plant for Lebanon.

The Industry Institute has investigated, on the initiative of the Government of Lebanon and the Salt Producers Syndicate, the profitability of establishing a refining plant. If the solar salt industry were to continue in Lebanon, then the low-quality solar salt produced at high cost must be refined, and the building of a refinery for that purpose could be a profitable venture. In fact, it appeared to be the only way the industry could survive its high production costs in the face of increasing outside competition. Therefore the practical answer lay in upgrading the product and hence increasing its value. That could be done most efficiently by a washing process, and at a relatively low unit cost.

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6. Transaction of the Middle East Standards Conference.  
mim., Industry Institute, Beirut, May 7-9, 1958.

7. Profitability Study of A Refining Plant for Lebanon.  
mim., Industry Institute, Beirut, Dec. 1957.

The designed plant was to refine 15,000 tons of crude salt per year. That amount represented the annual production potential of crude solar salt in Lebanon. It would produce 10,500 tons of purified salt. The degree of purity, through refining, would be raised from 85 to 99,5 per cent.

The capital investment required was estimated to be LL. 960,000. It was suggested that the Government advance LL. 650,000 for the project as a loan to be recovered from profits over a period of ten years. The remaining part was to be provided by the producers. Since the total area of ponds in Lebanon was more than 310,000 sq.m., the investment required from the producers did not exceed one pound for each square metre they owned of ponds. That made sure that every producer participated within his financial means.

It became clear, later, that little progress had been made in establishing a procedure for financing the construction of the recommended plant. The representatives of the producers did not agree on a specific plan, in spite of the Ministry of National Economy encouragement and the preparedness of the Industry Institute to help. The Institute went as far as forming a general programme and undertook full detailed studies of technical requirements, plans, and estimates of costs and profits.



b. Industry Institute Work With Governments Abroad:

The interest on the part of local governments in the consultative research services of the Industry Institute can be attributed to three factors. First, the march of industrialization has set the governments concerned to seek measures and ways of bringing home the benefits of industrial programmes and projects. Second, a cheap and easily accessible centre where scientific experience and research services were to be found. Most of these countries are far from the developed technical and industrial centres of the West, while the specific lack of highly trained technicians have prevented the creation of a centralized organization for industrial development to which governments can resort for help and guidance. Third and finally, the founders of the Industry Institute contemplated that as the Institute develops in experience and technique it may well become a centre from which Lebanese assistance, could be made available to industries in neighbouring countries with similar problems.<sup>8</sup>

Of all the governments of the area, Jordan figures out as one of the most prominent public sponsors. Under the terms of an agreement with the Jordan Development Board, the Institute is providing technical consulting services in various sectors

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8. The Joint Technical Cooperation Project Agreement,  
Art. I.

of the economy and especially industry. This involves furnishing basic technical data required for planning purposes and review of specific developmental projects to determine their feasibility and soundness. The Board has also retained the Institute as consultants to evaluate loan applications within the Industrial Development Fund of that country's Government.

As in the case of Lebanon, the Institute is elaborating a programme for the establishment of a standards system in Jordan. The standardization programme involves a feasibility study, drafting of the enabling law and advising on organization and physical facilities required.

The Industry Institute is having its first integrated project in the field of industrial building design. The Nablus Vocational School, which is intended to prepare students for industrial vocations, includes seven shops : automotion, sheet-metals, plumbing, wood working, machines, forging and electricity. The Institute is using outside consulting civil and architectural engineering services on the project.

Feasibility studies for Jordan comprise, among others, one on the industry of fertilizers. It covered a study of the economic and engineering aspects of various approaches to the production of nitrogenous and phosphatic fertilizers in Jordan for the local market and examination of export potentials.

Another, an evaluation of known deposits of ceramic clay raw materials has been undertaken and is being followed by feasibility studies of industries based on suitable raw materials. The evaluation of these raw materials included chemical analysis and special test firing under controlled conditions in the Institute's pilot plant. Finally, a feasibility study of an industrial venture to produce cardboard and heavy paper products for packing of Jordan's agricultural produce and some of its industrial products was completed.

In the case of Kuwait, the technical, organizational and economic feasibility of a slaughterhouse for the slaughtering of two thousand sheep per day has been recently completed. Equipment specifications, financial and organizational bases, and production planning were among the aspects given thorough appraisal. Thus all the stages are designed and studied since sheep are ushered into the yard and holding pens till killing, flaying and final distribution as fresh or frozen meat.

A feasibility study was successfully conducted for a plant to bottle and distribute liquified petroleum gas (Butane gas) in the Kuwait market. This was followed by design of the plant and preparation of the book of tender for international bidding. Erection was started early in 1961.

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9. The Institute has sought the geological knowledge of a German organization to complete its full scale study for the creation of ceramic industries in Jordan.

One of the most ambitious projects which the Industry Institute is furnishing, under a recent contract with Kuwait, is in connection with the establishment in the country of grain silos and a plant to mill wheat for Kuwait requirements in flour, mainly for Arabic bread.

The services of the Institute were sought in two non-Arab countries : Somali Republic and Iran. In the first case, a market survey in the field was conducted to determine the export potential of Somali meat and meat products. At the same time, the livestock situation, slaughtering and meat packing facilities of the country were appraised to determine their suitability and the need for their development.

In Iran, the nature of the project undertaken was of a very broad scope. Here the Institute, on a contract to the United States Operations Mission to Iran, is providing technical consulting services in establishing and rendering operational the development laboratories of the Industry and Mines Development Centre of Iran. That involved choice of equipment and preparation of specifications, establishing work programmes, laboratory and research organization and administration and training of staff.

2. Privately Sponsored Projects:<sup>10</sup>

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10. The writer, in preparing this section, has depended heavily on the Industry Institute Brochure and its Supplement.

Although the findings of projects contracted by private sponsors, both in Lebanon and abroad, are considered strictly confidential, yet it will be desirable, at this stage, to cover a number of the major privately sponsored research studies. As these comprise the bulk of the Institute's work.

Wall tile plant feasibility -

Following the Institute's preliminary survey of Lebanese clays, towards the end of 1957, a study was undertaken of the feasibility of a ceramic wall tile plant in Lebanon. A geological survey was carried out to locate suitable deposits of sufficient quantity to measure 20 years' production for the plant at the rate of 20,000 tiles per day. The market was studied to determine the sales potential. The investment required was analysed together with the cost of production and the projected profitability over five years.

Feasibility of integrated canning plant -

A feasibility study for an integrated canning factory was studied, based on varieties of fruits and vegetables canned under various forms. An intensive market research was conducted, covering the prices of existing similar products on the market, potential sales were determined, based on various levels of sales prices, and a recommended manufacturing programme showing the capacity of the various proposed lines was presented.

Detailed equipment requirements and specifications as well as a preliminary layout were prepared. The required capital investment and the operating costs were determined and the profitability of the enterprise was demonstrated.

Compost fertilizer raw material -

A study has been conducted to evaluate the availability of composting material in the refuse of a city of about 500,000 inhabitants (Beirut). That included a statistical study of the seasonal variations of garbage to determine the sampling procedures. And that was followed by extensive regular analysis to determine the content in compostable material, paper, glass, metal, bone and other recoverable by-products.

Market survey for plastic products -

The actual and potential local and export market for a plastic product was studied in order to determine the optimum size for such production.

Design of accounting systems -

The actual accounting practices of an engineering firm were revised and an accounting manual covering all the operations of this business was prepared. A new chart of accounts was recommended providing for properly classified information to be used by the management of the enterprise. A complete set of books, records and forms was designed to suit the particular transactions of the firm and detailed instructions for their

use were provided. Also the Institute has contracted to redesign the accounting system of the Regie Co-interessée Libanaises des Tabacs et des Tombacs, one of the largest industrial plants in Lebanon. The responsibilities of the Institute cover the review of a recommended prepared new system.

Chocolate and confectionery plant -

In Jordan, the Industry Institute has undertaken a feasibility study, including a market survey, calculation of investment required and production costs and projected profitability over five years was analysed. A book of tender was prepared followed by evaluation of manufacturers offers.

3. Other Industrial Surveys And Developmental Projects :-

These projects are conducted and intended to promote in the first place the establishment of healthy and viable new industries in Lebanon and the area at large. Such results are published or communicated for the serious consideration of financiers.

Thus, this part of the Institute's activities can be defined as a full study of the techno-economic feasibilities of a certain project, in which the Industry Institute follows

a specified procedure :

i - the study of the markets of the suggested product, the size of the market in the past, present and future, the level of prices and the cost and sources of the imported product, the required type and quality and the future development of demand.

ii - the study of raw materials, sources, quantities, prices, costs and its variety.

iii - the choice of the production process which is more suitable to labour, economic and climatic conditions in the country, and a preliminary pilot plant design is set defining the size of the plant and its potentialities (with reference to i and ii) and the major equipment and its costs are estimated (fixed capital).

iv - the study and estimation of the costs of industrial utilities of water, power and steam and its installations are designed.

v - the estimation of the operational costs of the plant and the working capital.



vi - the estimation of the total costs of production including taxes and depreciation are compared to receivables from expected sales. Thus the expected pure profit is determined, or the net yield of the project for the first, second and third years at least.

With regard to creating a hydrochloric acid industry in the country, the internal markets together with the availability of primary raw materials have been studied. The economics of production processes were evaluated with full consideration of possible exploitation of all the wastes of the selected production process in other potential chemical industries. It has been demonstrated that if electric power could not be provided at a lower price (not exceeding 3 p.l. per Kwh) and if the consumption of the compounds of chlorine show no expansion, then this industry would be economically nonfeasible.

The establishment of a paper plant for Lebanon has been quite a grandiose project. A study of the consumption of four main types of paper in Lebanon was surveyed : journals, kraft, wrapping and writing paper. The study covered the past five years and the rate of increase in yearly consumption. Furthermore, the production process and the required primary materials have been selected ; the

preliminary design of the plant has been set and the offers of the important manufacturing companies of paper equipment plants in the world have been obtained.

From results which have appeared so far, it seems that there is a need in Lebanon, and promising potentialities, for the establishment of a paper industry. The capacity of the plant envisaged is in the order of 40 tons per day, and the investment required is of the order of L.L. 10 millions. Yet two major obstacles hinder the setting of such an industry : the great quantities of water needed in manufacturing, and the importation of the necessary cellulose primary materials. It is proposed that there be more expansion in research to estimate the possibilities of producing the required cellulose materials in Lebanon before concluding the study on the basis of importing these materials.

For this, it is desirable that necessary allotments be made for completion of the elements of the present study and which include : a) the cost of production in detail for the types which are recommended for production. Also the reconsideration of total capital and expected profits, the verification of water resources as well as the rest of the factors in order to determine the site of the plant. b) Possibilities of growing

plants by the concerned agricultural authorities, which can be used as a primary material for the extraction of cellulose, so as to be able to stop importing this material after a number of years. The study has to consider the sources and suitability of the wastes of agricultural products, now available in the country, from grass and banana leaves and 'stalks' of tobacco as well as others. A pilot plant unit is recommended to be set at the Industry Institute for further research.

The Lebanese consuming market of rubber tires has been studied in relation to the types, measurements, quantities and the cost elements of its importation were determined. The rate of increase in cars, trucks and other vehicles in Lebanon has been studied, while the average consumption of all types and standards of tires was determined. Moreover, the productive capacity of the proposed plant was again determined and a preliminary design set with detailed production costs and the amount of needed capital for the projects as well as other expenses.

It was found out that the project was desirable, yet the degree of its financial feasibility follows the protection policy which the State may see fit. The Industry Institute is able, once willingness is found, to complete fully this and other developmental projects, and to set a detailed programme for

work, its timing and costs.

C. LABORATORY TESTING AND ANALYSIS:-

From the start, the setting up of physical and chemical laboratories formed part of the conception of the Industry Institute to provide a reliable and permanent centre of scientific investigation through chemical, mechanical and electrical measurements, to offer testing and analysis services to check on the quality of raw materials and to control production. Hence proper personnel were employed and trained, modern tools, equipment and instruments were acquired, while the application of approved international methods and dependable testing procedures has been the uninterrupted task of the past years.

1. For the General Public :-

The Institute has realized the absolute essentiality of analysis and testing facilities, for if they are wide enough in scope and of reliable scientific standards they constitute in themselves a fundamental contribution to the overall national productive effort. The services are given to the public in the Institute capacity as an independent organization. Similar services, in Lebanon and neighbouring Arab countries, if they do exist, are only to be sought within the framework of Governments, big foreign companies or academic institutions. As such,

and in general, they are naturally not available to industrialists and businessmen.

Both routine and specialized chemical and physical tests and analyses are conducted in a wide variety of fields including : petroleum products, fuels, water, ceramic materials and products, cereals, fertilizers, minerals, beverages and leather. All fees of current analyses and tests undertaken by Institute laboratories are determined on a cost-incurred basis.<sup>11</sup> Thus they are in full conformity with the not-for-profit character which dominates all work carried by the Institute.

Quality control now ranks in importance with control of quantities and costs. Deep changes in the make up of our Arab society have created the need for a scientific approach to the maintenance of uniform quality in industrial products. Product inspection and control have become increasingly vital. Universally accepted methods and procedures of the ASTM, AOCS, BSI, AFNOR, DNA<sup>12</sup> and so forth are adopted. Thus disputes and claims in quality, specifications and the like are brought to the Institute's laboratories for certification or arbitration.

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11. A list of fees is issued periodically by the Institute covering the cost of analyses and testing work in its laboratories.

12. i.e., American, British, French and German systems of standards and measurements.

It can not be denied that the local market in the Arab countries is highly biased against local products, while foreign manufactured ones receive unquestioned acceptance. Unfortunately, not all of our industrialists are aware of the quality challenge; few in fact have responded to it. Undoubtedly, goods must be of high and uniform quality to find acceptance in competitive markets.

2. For Governments:-

The Institute's laboratories are recognized as having official status by the Lebanese Ministry of National Economy (Consumer Protection Service), the Customs Authorities, and the Health and Agricultural Ministries of the Government of Lebanon.

In contrast to the year 1959, which was the 'Project Year' - as a result of the Institute's reputation being established in Lebanon and neighbouring countries - 1960 would have been Standards Year, were it not for the delay in passing the Standards Law by the Lebanese Parliament. Before 1956, there was no actual

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13. See : (i) M.D. Attiyah, "Industrial Growth: Elements and Requisites", Al-Jaridah, n.2317, July 7, 1960, p. 7.  
(ii) S. Hayek and A. Najjar, Report on Industrial Productivity, mim., Industry Institute, Beirut, Dec., 1956.  
(iii) Draft Law for a Lebanese Standards Organization.

separation between income arising from public laboratory testing and analysis and that arising from Governments, but more than half the income came from testing and analysing samples pertaining to Government departments and ministries.

As the following Table V shows, the Institute's income has been drastically reduced and left very meagre indeed - few hundred pounds per month, as a result of the diversion of all the testing of the Consumer Protection Service of the Ministry of National Economy, late in 1958, to the Central Health Laboratory. Yet the Institute continued to command official status.

The Industry Institute was chosen by the Kuwait Government to act on its behalf in the inspection and certification of the manufacturing, testing and shipment by a Lebanese plant of building materials worth several million Lebanese Pounds. The Institute continues, up to the present, as plant inspectors and certifying engineers on behalf of the Kuwait Government in connection with some purchases of that Government from Lebanese industries.

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T A B L E V  
 INDUSTRY INSTITUTE'S INCOME FROM STUDIES  
 AND RESEARCH WORK AND LABORATORY TESTING ANALYSIS  
 1953 - 1961  
 (L.L.)

YEAR	LABORATORY TESTING AND ANALYSIS			STUDIES AND RESEARCH	GRAND TOTAL
	Public	Governments	Total		
1953	-	-	26	-	26
1954	-	-	15,164	-	15,164
1955	-	-	38,952	15,475	54,427
1956	17,712	17,666	35,378	47,823	83,201
1957	19,407	21,753	41,160	113,189	154,349
1958	8,170	7,150	15,320	118,382	133,702
1959	17,260	5,268	22,528	169,801	192,329
1960	20,546	2,112	22,658	281,257	303,915
1961	22,722	3,969	26,691	522,858	549,549
					1,426,662

SOURCE: S. Samaha, Industry Institute, June, 1963.

Board has approached the Institute for designing and setting up of a system of standards and specifications in the Kingdom, aside from the testing and analysis of clay deposits for the ceramics industry which the Institute has undertaken.

## CHAPTER FOUR

### THE INDUSTRY INSTITUTE : A COMPARATIVE STUDY

#### A. INTRODUCTION:-

The present chapter has comparison as its theme : how the Industry Institute figures out in contrast to other systems of management and research centres of developing countries on the one hand, such as Egypt (UAR) and India; and with those found in the more developed countries such as Japan, the United Kingdom and the United States<sup>1</sup>. Therefore, it is of necessity a short yet rapid survey of conditions and institutions that help develop human resources - how nations are committed to research and innovations.

#### B. INDUSTRIAL RESEARCH IN DEVELOPING COUNTRIES:-

It is striking if one has to contrast between developed countries investment in development and industrial research and that of the developing countries. Heavy investments have been made in industrial research and development by many advanced industrial countries and further expansion is planned ahead. On the other hand, the developing industrial countries are in an advantageous position to benefit from the techniques and experience of the advanced countries, yet they

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1. The writer is much indebted to Management in the Industrial World (Harbison & Meyers) and especially chapters 7,8,13 and 16 to which he has resorted in making up the skeleton of the above chapter.

lack the development and research staffs.

1. E G Y P T (U.A.R.):-

The industrial sector of Egypt, though limited in size, is quite impressive. Industrial production, since 1952 Revolution, has more than doubled. A plan was envisaged by the Ministry of Industry in 1957 to double industrial production in the five years to come, and in fact it was realized two years in advance.

Today the United Arab Republic has taken up modern industrial development techniques, stress laid upon high ovens and heavy basic industries. The acquisition of foreign exchange for the importation of raw materials, modern machinery and food for her people is the ultimate aim behind industrialization, besides offering goods for the Afro-Arabian markets and hers domestically.

The country lacks the competent administrative and managerial manpower. But this is more felt in Egypt due to the fact that industrialization is still in its first stages, and any industrial development of significance has taken place only within the last decade. Yet industrial experience is building up as developmental projects are launched with

a host of technicians, engineers and research staff. Moreover, the Suez aggression of 1956 led to replacement of many British and French managers by young military officials.

It is believed that for industrialization to attain its set goals, Egypt must accumulate industrial entrepreneurs and professional managers, of high academic competence and technical training. Thus for years now many of the present generation are sent abroad to Germany, England, the United States and the Soviet Union for practical experience and specialized training. As a result, the university graduates are more attached to industrial employment than before.

The country's institutions for generation of high level human resources needed for the development of the home economy at large are fairly progressed in comparison to other less developed countries. The universities, technical training institutes and centres of research claim to have quite good programmes of study, training and high talented leaders. The quasi-public enterprises and the Misr group of companies have won over these new administrators who are ever keen to adopt new practices, techniques and procedures which may bring about rapid industrialization.

It was towards the end of 1958 that formal recognition was made of deficiencies in industrial research and managerial studies. Universities in the Arab Republic started business administration programmes for competent management, and in large quasi-public companies, such as the oil refining, iron and steel and textiles, centres of research were set up for creating a nucleus of specialists, highly trained and able to achieve development objectives.

Of course these institutions will not, in themselves, secure the type of basic alterations needed to bring home a widespread economic growth. Yet it seems fairly certain that revolutionary Egypt has already demonstrated to master the everincreasing problems of technology in the industrial superstructure through its young management.

## 2. I N D I A:-

India shares with the United Arab Republic the shortages of managerial resources which are quite inadequate, once accelerated and planned industrialization is in mind. The Five-Years Plans of India have stressed the development of basic heavy industries, besides projects of transforming village community and raising food production levels.

Even now, the Indian Industries are predominantly on a small or medium scale with patrimonial management. Yet technology has spread out rapidly in cotton textiles and quasi-public steel and fertilizers industries, thus promoting keen interest in problems of management, techniques and skills. Emphasis has been laid as a result on professional management, and the typical highly centralized and nepotist management is dying away and regarded as inefficient for industrial development.

It was quite recently that research centres were set up by the various associations of industries; thus pioneering progressive managerial outlook and effecting industrial studies for training and technical experience. Unfortunately, it is still with the Indian education system that the well reputed universities lean heavily to law and the humanities which is by all standards not susceptible to developing an industrial society.

The Government of India, recognizing these and other weaknesses, appointed in 1950 a Board of Management Studies to make recommendations for the development of industrial management and economic research training programmes with emphasis on techniques, tools, principles and practices. It was late in 1955 that such steps were taken at Indian univer-

sities and institutional centres. The technical assistance of the International Labour Office was tapped to help improve the quality of supervision and train experts in many Indian industries. Seminars and conferences on management problems developed later.

Although these and many other programmes have gone a far way to promote a professional well trained management, yet the majority of Indian industries are unaware of the benefits of research and application of industrial techniques and developing managerial skills.

C. INDUSTRIAL RESEARCH IN DEVELOPED COUNTRIES:-

1. J A P A N:-

The rate of economic development of Japan is quite impressive and has surpassed most industrialized nations. In fact, the country has the highest income level in Asia. It was the State and neither a revolutionary elite nor a rising middle class which played the major role in bringing about industrialization and wealth.

Certainly Japan has no natural endowments nor plenty of capital which make her a leader in ship building, textiles and transistors the world over. It is an enlightened management that developed human resources to utilize modern machinery and



industrial processes, and rational application of factors of production. True that the Japanese were late comers to industrialization, yet they have benefited enormously from the rich experience of the West in technology and research. Capital, know-how and the best administrative and technical personnel all promote rapid industrialization. Strange enough, an over supply of administrators and technicians has become the crucial problem of human resources in Japanese industry. The country's ability to utilize high-level human resources is smaller than her capacity in generating high-talented manpower.

The State, within the space of fifty years, invested heavily in education and that was reflected in universal education, vocational training centers, universities and industrial research institutes. Missions of engineers, scientists and managers were sent abroad to borrow and adopt technical experience, advanced ideas and innovational processes. Rarely was the humanities or the law emphasized. Thus, through research and science, Japanese products everwhelmed the world. What Japan needs at the present is a radical change in the outlook of top management to maintain the country's amazing pace of growth intact : a more humane approach to labour problems.

## 2. UNITED KINGDOM:-

Britain, the cradle of the Industrial Revolution, was

known as the workshop of the world, and her industries set famous standards of performance and initiative. Management, in developing advanced technology, is facing at present challenging conditions such as the nationalization of basic industries after World War II, increased power of trade unions and the pursuit of a social welfare state with heavy taxation repercussions.

In contrast to Japan, Britain suffers from a short supply in managerial resources. Lack of managers with specific technical training, as technology advances and more administrative ability, as more industries are merged and organizations become quite complex. In this respect, great efforts are taken towards developing adequately competent managerial resources. Thus recognition is made of raising the quality of performance of industry and management. Research centres and scientific institutes have spread the notion that management is but a skilled job which demands high qualifications and training.

The British Institute of Management established in 1947, among others, has gone a long way in the direction of circulating effective information about advanced managerial practices. It promoted comprehensive research into industries, and sought a well developed system of training management. Hence important

results were achieved in scientific analysis and industrial research. Specific techniques in hand with administrative changes paramount for utmost efficiency have greatly improved. Quite evidently, professional organization is on the move : values and objectives have been reconsidered in the light of intense competition from abroad.

Impact is being made on most British universities such as Oxford and Cambridge as well as London, Birmingham and Manchester, where courses, seminars and conferences in advanced managerial practices and systems are taken up with enthusiasm. Executive programmes are developed with special stress on innovations and industrial research to raise the standards of professional management. Yet internal programmes of management development, at the firm level, must have priority.

### 3. UNITED STATES OF AMERICA:-

Unlike other industrially advanced nations, the United States has the highest concentration in its economy, which has gained voluminous growth since the Second War, and that is witnessed in its giant corporations. What led to this growth of the corporate system, and eventually the separation of ownership from control, is clearly seen in the mushrooming industrial organizations, wide national markets and a complex advancing technology which resulted in products diversification

and greater adoption of integrated processes or 'continuous flows'.

From the beginning, scientific management was recognized as an economic factor clearly distinct from other resources of labour and capital. Technical and managerial skills still continue to be utilized more fully than in any other industrial country. In recent years, furthermore, heavy investments were made in industrial scientific research and application of innovations to improve on the skills and talents of managerial powers. It is envisaged, however, that such investments would increase manifold as a result of electronics and space conquests.

Professional management has played a greater role in the United States than in any other industrial nation. The managerial career is determined quite clearly more and more by a background of high educational qualifications and therefore the old business executives of the family type are passing away.

The highly respected status enjoyed by present management in the social and economic professions and occupations of the United States is attracting thousands of American youth to research institutes and scientific centres. Competent graduates in engineering, sciences and business administration are starting successful careers in management than in most other developed countries.

Universities, research centres and technical institutes as well as the American Management Association all offer management programmes and professional courses and seminars leading to specialized jobs in industries. These have been carried also within the corporations. Such development of management practices are carried with the sole objective of improving already existing professional skills and administrative knowledge and preparing those with extraordinary abilities to advance and take over positions of leadership.

Other training programmes have developed at technology institutes such as Carnegie, Chicago and Massachusetts. Here, practical approaches to industrial problems such as statistical quality control, electronic computers and automated production lines are tackled which might be faced in an increasingly complex technological society. A highly competent management assures survival and growth in an ever competitive dynamic economy.

CHAPTER FIVE  
THE IMPACT OF THE INDUSTRY INSTITUTE ON INDUSTRIALIZATION  
AND DEVELOPMENT

A. INTRODUCTION:-

The preceding chapters have surveyed the first ten years of the Industry Institute. It is not quite feasible, although the information contained in the previous chapters are up to date, to measure and assess the results of the projects and work carried out by the Institute in Lebanon and the neighbouring Arab countries. This concluding chapter, however, will evaluate the aims and objectives envisaged at its establishment. The purpose was stated to create a permanent national centre wherein specialized scientific knowledge and experience, material means and technical data, information and production methods are gathered and developed. These complement each other into an integrated service organization that offers professional services to industry and industrial development in the form of reliable consultations, studies, research, analysis and testing.

The main crucial question to be answered is whether, at this stage, the Industry Institute has contributed to the overall economic development of Lebanon and that of the area. For as industrialization progresses, both existing and potential industrialists find a need for a broad background of general economic, technical and managerial information.

Industrial development does not take place all by itself : it must be encouraged and assisted.

Hence, this final chapter emphasizes the impact of the Institute on industrialization and economic development of Lebanon. Furthermore, it handles critically the role the Industry Institute plays in future Middle East development.

Finally, a global evaluation of the extent of research activity is duly considered, and a study of the obstacles and problems which face the Institute is taken.

B. THE INDUSTRY INSTITUTE AND THE ECONOMIC DEVELOPMENT OF LEBANON:-

As industrial research is an intangible service, the immediate results of which are of an unfamiliar nature to analyse, it is certain to face a multitude of difficulties, especially in the less developed countries. Yet in Lebanon, such difficulties are not so pronounced as in the less developed countries undergoing industrialization. The services of the Institute are more readily resorted to than it is generally the case with those countries which plan to industrialize. The environmental conditions are quite favourable.

Lebanon has a higher level of education than most of the less developed countries. The country's greatest asset lies not in its material resources, but in its human resources that

attained the level of prosperity Lebanon enjoys presently. Although there is a profusion of educational systems, yet the freedom of education, especially in the higher levels, has helped much towards developing a competent body of technicians, scientists and administrators. The number of students enrolled in Public Schools stood at 105,922 in 1959, while enrollment in Private Schools was 160,000 with total 2,490 Schools.<sup>1</sup>

Vocational training and technical education are still at their infancy. This type of education should be developed from its rather primitive stage, as it was stated at the outset if this country is ever to achieve high level of development. Research by itself does not bring about economic development. Presently there are only seven government vocational schools that have mechanics, electricity, metal works, printing, industrial chemistry and the like, with enrollment that stood at 975 students in 1959. There are in Lebanon sixteen private vocational schools with 590 students, that teach such subjects, besides the above mentioned, as book keeping, radio and wireless and commerce.

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1. Preliminary Assessment of Manpower Resources And Requirements In Lebanon, Economic Research Institute, 1959 (n.p.)



Furthermore, there are seven institutions in the country that cater for higher education. They are : American University of Beirut, University of St. Joseph, Beirut College for Women, Lebanese Academy, Lebanese University, Middle East College and Beirut Management College. Enrollment in the first six institutes was more than five thousand during 1959. Of all the Universities, only the American University and University of St. Joseph that contribute, through their well-equipped laboratories, to research and scientific analysis. Only in the former, on the other hand, graduate business administration courses are taught. Executive development programmes and management practices, particularly in the Beirut Management College, are carried through seminars, conferences and the like from time to the other in association with local businessmen and industrialists and international bodies.

No dependable information is available on students who are studying abroad in educational missions, or otherwise. But the Institute of International Education states that 544 Lebanese students were studying in the United States during the academic year of 1959, most of them were in the sciences and business administration.

In the absence of basic statistics, it is difficult to give a general appraisal of the manpower resources of the

country. Up to the present, the Lebanese governments fetch the consultative services of foreign experts and international technicians to accelerate the rate of development in administration, industries and the economy at large.

It is almost impossible to measure the impact of industrial research and technological information rendered. At best they act as catalytic agents, in the overall industrial development of Lebanon. But it is generally accepted that if technical knowledge and research are successfully implemented in the developed phases of a project, may result in economic gains, more efficient production and direct attributable benefits.

Although it is difficult to assess the impact of the industry Institute on the Lebanese economic development, yet certain conclusions can be made.

1. Extent of research activity and the readiness to use the outflow from research and development :

The first few years of the Industry Institute were on the whole years of experimentation and learning for the Institute's staff as well as Lebanese industrialists and businessmen. Several projects suffered delays, and in few cases failures in the implementation and control of projects studied. In one or

two incidents, research was discontinued and the projects were dropped altogether.

The Lebanese expect much, and in a relatively short time. Thus the main criticism forwarded in this conjunction is that relatively limited capital has been spent on research and development compared to other countries, especially at its initiating years, as most of the Institute's income came from the United States Operations Mission to Lebanon. One reason given for the small allotments in the direction of research was that technical information and research knowledge was given on the basis of requests when approached by the various industrialists. Lack of planning resulted in less projects being considered. The spirit of guidance was almost non-existent to the Government. Lebanon is in such an advanced state of development that it needs a research centre to spread out technical knowledge together with the State's protection and guidance in order to have a tangible impact on the country's economy.

The industrial sector can be developed not only by establishing new industries, but also through improvement of the existing ones through lowering their costs of production and improving the quality of goods produced. Existing industrial establishments are faced with problems of competition, of high cost of power and of limitations of the local markets.

Industrial establishments in this country are on the whole too small to afford industrial research and extensive market surveys and labour training. Thus they have difficulty in improving their inefficiency and increasing their productivity. The extent and implementation of research and development could only be measured by these results. Whether a large part of research output pays its way through products input.<sup>2</sup>

2. Innovation and management:

Unfortunately, not all industrial establishments and business organizations are equally receptive to research and development techniques. Such attitude is partly explainable in that few senior managers realize the benefits of research in securing more efficiency and higher productivity. Granted that the financial position and the commercial objectives of the firm should receive prior consideration, most Lebanese executives consider research as an extra cost to their establishments.

It is true that industrial research for the most part should pay for itself. Management has to reap the fruits of its investment in the years to come. Yet it becomes a crucial question of growth, or decadence, in an ever competing world of science and technology, if the Lebanese administrators in question do not resort to application of modern management principles and

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2. Carter & Williams, op.cit., p. 62.

implement innovation at all phases of production and industrial processes.

Enlightened young Lebanese managers are stressing more and more the importance of a rapid and apparent rate of growth of research and development expenditure to cope with their ever increasing problems arising from inadequate information and shortage of consulting services. Innovation, through research, becomes an inevitable tool for the progress of industrialization in this country.

C. THE ROLE OF THE INDUSTRY INSTITUTE IN MIDDLE EAST DEVELOPMENT:-

In its endeavour to promote commercial and industrial activity to bring about a rising level of income, the Industry Institute has extended its services to neighbouring Middle East countries since the early years of its initiation. The impact left varies from one country to the other, and from one project to the other.

In those countries where the state plays a major role in shaping and orienting the economic activities of the community, the Institute has had an impressive role to play in contributing towards development and spreading out technical information. As it has been said previously, most of the countries of the area are far from the developed technical and industrial centres of the West. Added to that, many countries suffer

shortages of high skilled manpower, technicians and administrators. Thus the Institute pledges full and cheap consultations and technical knowledge to the industrialists and businessmen of neighbouring countries.

Feasibility studies are offered in conjunction with long-term economic and technical developmental programmes. In many instances, the Institute is the sole consultative centre that offers its services in all aspects of standards, analyses and measurements to the respective Governments. Moreover, research organization and administration and training of staff are well under way.

However, it can be stated at this stage, that many difficulties face the Institute in implementing the final phases of a project in the neighbouring countries. Application of research is not an easy venture. For certain features inherent in the economic and social structures of the area which put high hurdles along the path of exchange of technical knowledge. Basically, the educational systems are below standards in most of the countries where the Institute has given technical assistance and research information. It would be a welcome revelation for the Institute staff of technicians and scientists to find that governments as well as private establishments, are getting more and more used to new ideas and availing themselves

of modern practices and tools of development.

Certainly, the role of the Institute would be much more impressive in stepping up economic development, if both the Governments and communities concerned would get enthusiastic about the achievements of research and technical assistance. Research alone can not bring about economic development all by itself. Gigantic efforts to accelerate growth and provide a higher level of income must ultimately rest with the people themselves.

Many of the Middle Eastern countries share basic problems with Lebanon. Although it cannot be expected that radical improvements would take place in the foreseeable future unless basic approaches occur in the outlook and receptiveness of neighbouring communities to the winds of development and change which are blowing from centres of enlightenment. The march of industrialization is likely to discontinue if the socio-economic conditions do not alter.

The task of the Industry Institute becomes thus extremely difficult. Yet the important test will be whether countries who have resorted to the Institute's technical assistance have profited from the knowledge they have acquired and whether they will continue to apply it once the project or

study is handed over.

**D. CONCLUSIONS AND EVALUATION:-**

The slowness with which industrial research and technical knowledge reflects themselves in the performance of the Lebanese economy and developing that of neighbouring Middle East Arab countries, coupled with the relatively short period surveyed make it rather difficult to pass judgements on the Industry Institute. Yet, few concluding remarks are put here which necessarily contribute towards a global evaluation of the success or failure of the Institute as such.

1. Measured by financial standards, the Institute has progressed tremendously towards becoming completely independent from external aids. The income has risen many folds, from twenty six Lebanese pounds in 1953 to over a million presently. Since 1960, the Industry Institute has stopped receiving the United States Mission aid.

2. The Institute possesses now an advanced and coordinated well-equipped body of technicians and industrial consultants in Lebanon and the whole Middle East area. Staff competence, high training and familiarity with local problems



have built up a worthy reputation for the Institute in analysis and testing besides consultative services in management and industrial research. Invariably, the Institute's activities have made themselves felt in one aspect or another. True, some projects were successful enough to be handed over completely to private and public sponsors, still a few had to be discontinued either during the early phases or after they were handed over.

3. Taking all factors into consideration, the Industry Institute; more than any other organization in the area that extends services of similar nature, must endeavour to promote interest in research and stimulate change and progressiveness at all stages of production and marketing. Practices of management and modern tools of technology should be induced to improve the quality of products, reduce costs and increase economic efficiency - in all to speed up rational industrialization.

4. At the level of the firm, inadequate approach by local industrialists and businessmen to their problems, and therefore to research and scientific management can no longer be forgiven. The march of industrialization and technology dictates an urgent resort to application of modern practices

of management and adoption of new ideas. Future standards of performance impose a change in outlook of many Arab executives. The new generation is coming to realize that progress must be fought for quite hard.

5. Again, the progressive Arab Governments have to coordinate their policies towards protecting backward industries and accelerating the application of research and technical development. More centres for spreading out consultation services, on lines parallel with that of the Industry Institute, in production and industrialization must be established. Care should be taken in improving the educational systems and raising their standards. Management institutes and vocational training schools should be encouraged. Moreover, industrial credit have to be provided for and extended.

6. Given all these factors, Lebanon, more than any other country in the area with all the favourable conditions, is destined to supply the Arab nation with the required faculties leading towards industrialization and eventually higher income levels. The Industry Institute, with proper leadership and planning, can surely help to build up the confidence which will be necessary for speeding up that process.

In conclusion, the services and scope of activities of the Industry Institute will undoubtedly play an important role in attaining and promoting the objectives for which the Institute was first created.

## APPENDIX A

### JOINT TECHNICAL COOPERATION PROJECT AGREEMENT BETWEEN THE TECHNICAL COOPERATION SERVICE FOR LEBANON AND THE LEBANON MINISTRY OF NATIONAL ECONOMY AND THE MINISTRY OF AGRICULTURE AND THE ASSOCIATION OF LEBANESE INDUSTRIALISTS.

#### Article I - The Establishment of An Industry Institute

This is a joint Technical Cooperation Project in the field of industry and its development.

#### Article II - Joint Participation

This project agreement is entered into between (1) the Directory of the Technical Cooperation Services for Lebanon (2) the Lebanese Ministries for National Economy and Agriculture and (3) the Association of Lebanese Industrialists, pursuant to the Technical Cooperation program agreement between the Government of the U.S.A. and the Government of Lebanon, dated June 26, 1952. The provision of such program agreement shall be applicable to this agreement and to the conduct of the project described herein.

#### Article III - Joint Aims and Objectives

1. The existing industries, entrepreneurs intending to establish new industries and Government Agencies concerned with the guidance and orientation of industry, are faced with technical, production and organization problems the solution of which requires direct access to a centre with trained personnel and adequate technical facilities.
2. Lebanon's historically mercantile economy, its distance from the developed technical and industrial centres, the small size of its industrial establishments, and the specific lack of highly trained technicians have prevented the creation of either a centralized or individual organization for industrial development to which governmental or private agency can resort for help and guidance.

3. There is at present an important segment of the population employed in industry, while the closing down or the drastic curtailment of certain industries which had been hurriedly set up to meet the country's war economy has left a large number of workers unemployed.

4. With an economy almost entirely based on trade, Lebanon runs the risk of having its sources of supply blocked in an emergency. Moreover, in normal times, the economy of the country leaning heavily as it does, on trade is unbalanced and requires adjustment which can only be effected by the addition of economically feasible industries.

5. This project agreement is therefore designed to provide the country with a reliable body of experts as an organized channel for the exchange of technical knowledge and production methods between specialists of the Technical Cooperation Services, the industries of Lebanon, and university research units and laboratories with a view to affording existing industries technical advice and promoting the establishment of healthy industries and adequate methods of production.

6. The availability of an industrial institute in Lebanon which would provide these and such like services is an asset to the country all the more valuable because it can be economically established for the reason that there are in Beirut two universities possessing adequate laboratories which shall place at the disposal of the institute, at a modest cost, the use of established facilities.

7. It is contemplated that as the Institute develop in experience and technique it may well become a centre from which Lebanese assistance could be made available to industries in neighbouring countries with similar problems.

8. An Institute at the nature foreseen stands in need of financial assistance for a number of years in the immediate future until the Institute develops, becomes better and self supporting.

#### Article IV - Joint Plan of Action:-

An industrial institute is hereby set up on the following terms and conditions.

- a. The Institute's principal offices shall be in the city of Beirut, Lebanon and the Institute shall therefore be subject to the laws of Lebanon.
- b. The Institute shall be regarded as a corporate body possessing the juristic personality represented by a Board of the INDUSTRY INSTITUTE which shall comprise representatives of the Lebanese Ministries of National Economy and Agriculture, the association of Lebanese industrialists and a university representative from the university with which agreement would have been reached for the use of the facilities in its laboratory and research units. A Point IV representative shall be a member of the board as long as funds are provided by Technical Cooperation Services for the upkeep of the Institute.
- c. The institute shall provide an organized channel for the compilation and exchange of technical knowledge with regard to industry, methods of production, managements, cost accounting and similar technical services. It shall also advise, gratuitously or for a fee, as the Board shall direct, individual industrialist or bodies, Lebanese or foreign, on industrial problems referred to the institute.
- d. The Board shall establish a scale of fees to be charged for the services of the institute, and it shall have the right to elaborate rules for the grant of exemptions in appropriate cases.
- e. The Board shall have the power to nominate the staff required including the recruitment of the foreign technical officers on the advice of the Technical Cooperation Services as long as that body continues to contribute to the upkeep of the Institute. The Board shall also have the power to incur and defray all legitimate expenditure in connection with the Institute.
- f. The term of office of the Board shall be two years, at the expiration of which the parties hereto or any body which may have been set up to replace them shall, by agreement, select the seven members of the Board. Retiring members shall be eligible for re-appointment.
- g. The Board shall arrange for the accomodation of the Institute and the use of floor space and university facilities within the financial provisions made available.

- h. The Board shall meet at least, once a month, and more often whenever it is deemed necessary in the interest of the institute.
- i. Meeting shall be convened by the chairman, of the Board or on his behalf by delegation. The latter calling the meeting shall contain the agenda of the meeting before the Board.
- j. The Board shall manage the funds and property of the Institute and shall arrange to keep proper accounts of all receipts and expenditure, which accounts shall audit annually, by an auditor approved by the parties hereto.
- k. All fees collected and other receipts shall accrue to the Institute and shall be managed by the Board.
- l. The Board shall prepare an annual budget comprising an estimate of the Institute's receipts and expenditure for the coming year. This draft budget shall be submitted to the parties hereto three months before the financial year then current expire.
- m. Full details of the functions of the organs of the Institute are set out in the accompanying chart which forms part of this project agreement.
- n. As soon as the Board is established it shall proceed with the discharge of its duties in accordance with the above agreed schedule .
- o. The Board shall prepare and in agreement with the parties hereto, put into force rules, regulations to organize the industrial institute and to govern its activities. The Board shall have the right with the consent of the parties hereto, to change or replace from time to time any rules and regulations put into force for the better administration of the Institute.

#### Article V - Estimated Duration of Joint Project

As there will be a continued need for the services of the INDUSTRY INSTITUTE, it shall continue beyond the duration of this Project Agreement. Joint support shall be needed only for the first years, depending on how soon the INSTITUTE becomes self-supporting. As soon as the INDUSTRY INSTITUTE hereby established,

shall become self-supporting the parties hereto hereby agreed to use their best endeavour to set up the INDUSTRIAL INSTITUTE as an independent corporation subject to the Laws of Lebanon.

#### Article VI - Joint Project Financing

The parties hereto shall contribute and make available to the extent provided below, funds for use in carrying out this project agreement and they undertake to provide for the maintenance of the INDUSTRY INSTITUTE from year to year within the limits laid down in the Technical Cooperation Program Agreement until the INDUSTRY INSTITUTE becomes self-supporting.

1. The Government of the United States shall make available during the period ending June 30, 1953, the amount of 150,000 in U.S. currency out it is expected that in respect of the following financial year beginning July 1st, 1953, an additional appropriation of 139,340 in U.S. currency shall be made available, subject to the availability of funds for the purpose.
2. The Government of Lebanon shall make available LL. 164,400 approximately LL. 75,000 as land and LL. 89,400 in Lebanese currency and salaries of full time employees, during the fiscal year ending Dec. 31st, 1953, subject to the approval of the Lebanese Parliament of this contribution and it is expected that the Government of Lebanon shall make available annual contribution as long as the Industry Institute is not self-supporting (V Art. IX).
3. The Association of Lebanese Industrialists will make available LL. 36,000 in facilities, professional services and in Lebanese currency in respect of the fiscal year ending December 31, 1953 and it is expected that further like annual contribution will be made available from year to year until the Industry Institute is self-supporting (V Art. IX).

#### Article VII - Program Equipment and Supply

1. All equipment purchased from contributions made by any of the parties hereto for the Institute shall be deemed and is hereby declared to be the property of the INDUSTRY INSTITUTE.



2. All information, patents, processes and techniques developed by the Industry Institute on its own account shall become its property. Policy for the sale or dissemination of these information, patents, processes and techniques shall be decided by its Board.

3. All information, patents, processes, and techniques developed by the INDUSTRY INSTITUTE under investigation and payment by private agencies and firms shall be property of these same agencies and firms, and all matters pertaining to the same shall be safeguard with respect to secrecy.

#### Article VIII - Funds Collected By the Industry Institute

Funds collected by the Industry Institute for services rendered to private or public organization shall become its property and shall be utilized according to the decision of its Board.

#### Article IX - Joint Project Administration

1. The nature of this project agreement is such that the joint administration of the Institute shall devolve on the Board. Until such time as the Institute shall become self-supporting the deficit shall continue to be met from joint funds which shall be contributed by the parties hereto within the limits laid down in the Technical Cooperation Program Agreement. The Institution's budget for the first year of its operation is set out in Article VI above.

2. Technicians and administrative personnel employed by the Lebanese Government and working part time with T.C.S. Industry and Transport in connection with other project programs whose salaries are not included in the Industry Institute budget will be paid supplement salaries from T.C.S. program funds.

#### Article X - Project Reporting

After its establishment the Board of the Industry Institute shall prepare and address at regular intervals, monthly progress reports on the work of the Institute to the Technical Cooperation Service, to the Association of the Lebanese Government

concerned. In addition the said board shall prepare an annual report which shall be submitted to the parties herein recited.

Article XI - Training

The Board of the INDUSTRY INSTITUTE shall have the right to recommend every year candidates for the Technical Cooperation Services Trainee Program from its staff of private industries, for training under the Point IV Trainee Program for Lebanon.

Done In Beirut On the 2nd Day of March, 1953 Duplicate  
In English And Arabic, Both Texts Being Equally Authentic

For the Technical Cooperation  
Service In Lebanon

For the Ministry of National  
Economy And Agriculture

Director, U.S. Technical  
Cooperation Service in Lebanon

Minister of National Economy  
And Agriculture

For the Association of  
Lebanese Industrialists

Vice-Presidents

## APPENDIX B

### CHARTER OF THE INDUSTRY INSTITUTE

1960

#### Chapter One

##### Status and Purpose of The Institute

- Article I - The Industry Institute is a Lebanese, non-commercial institution independent administratively and financially, for industrial studies and research and for scientific testing and analysis. It shall operate under the supervision of the Ministry of National Economy and is deemed, through Presidential Decree No. 10059 of the 17th of August 1955, to possess the status of a "public utility".
- Article II - The Institute is an independent juristic corporate body represented by a Board of Directors.
- Article III - The Official headquarters of the Institute is in Beirut, and it shall have the right to establish branches in all the territories of the Lebanese Republic.
- Article IV - The Purpose of the Institute's establishment is to create a permanent national center wherein specialized scientific knowledge and experience, scientific national means, and technical data and information are gathered and developed, complementing each other into an integrated service organization that offers professional services to industry and industrial development in the forms of reliable consultations, studies, research, analysis and testing.
- Article V - All assets of the Institute, whatever their source or origin, shall be deemed to be the property of the Institute, and the Institute shall have the right to dispose of same and enter into contracts to improve, develop, maintain and administer these assets. It shall moreover have the right to accept donations, bequests and aids and to add them to its assets and dispose of same.

Article VI - All information, processes, patents and techniques that the Institute develop on its own account shall be regarded as its property and the Board of Directors shall lay down the policies and regulations governing their exploitation and publication.

Article VII - If the Institute should lose its independent juristic status or be dissolved, the buildings and all its other assets shall become the property of the Lebanese State.

## Chapter Two

### Administrative Organization

Article VIII - The Industry Institute shall be constituted of :

- 1) The Board of Directors
- 2) The Institute Administration

Article IX - All legal rights, powers and authorities of the Industry Institute are vested in the Board of Directors, which shall also represent the Institute before the law. The Board shall have the sole responsibility for safeguarding and furthering the Institute's aims, objectives and for control, safeguarding and developing of the Institute's facilities and assets. The Board Of Directors shall furthermore have the right to accept aid from whatever source, whether in cash or in kind.

Article X - The Board of Directors shall have control over the Institute's administration and finance. The Board shall :

- (1) Appoint the Institute Director and terminate his services, delegate authority and responsibility to him, approve the annual budget before the 1st of January of each year and amend it subsequently as the need arises.
- (2) Appoint outside auditors to audit the Institute accounts and submit their report thereon to the Board.
- (3) Lay down the basis for the Institute's scale of fees and revise and amend same whenever the need arises.

- (4) Approve the internal by-laws for operation of the Institute and register same according to law with the Ministry of Labour and Social Affairs.

Article XI -

The Board of Directors of the Industry Institute shall be composed of seven members as follows :

- (1) The Minister of National Economy - as Government representative and chairman of the Board of Directors; or the Director General of the Ministry of National Economy as his deputy, or in case this is not possible, whomsoever the Minister of National Economy chooses to delegate from among the senior staff of his Ministry.
- (2) One representative of the Association of Lebanese Industrialists - the President of the Association or whomsoever is delegated by the Council of the Association every two years.
- (3) One representative of the Chamber of Commerce and Industry in Beirut - the President or his deputy.
- (4) One representative of the Lebanese "Order des Ingénieurs" (Beirut) the President or his deputy.
- (5) The Director of the United States Operations Mission to Lebanon or whomsoever he designates.
- (6) One bank manager or director, prominent in the fields of financing and credit.
- (7) One university professor, prominent in the field of technology or economics ; or one interested in the cause of national scientific research.

The Board of Directors shall have the power to add new members to itself as it deems necessary provided that the total number of members does not exceed eleven during the first year this charter is in force.

Article XII - The representative of the Government and the Association of Lebanese Industrialists shall each be a member exofficio; no quorum is considered complete in any of the Board meetings without the presence of at least one of them.

Article XIII - Should any of the institutions represented on the Board wish to withdraw from Board membership, it shall so notify the Ministry of National Economy and seek its prior agreement thereon. The Ministry shall have the right to designate the successor institution.

Article XIV - The Board's term of office shall be two years, at the end of which membership in the Board shall be retained only by the representatives of the Government, the Association of Lebanese Industrialists, the Lebanese "Ordre des Ingénieurs", and the Beirut Chamber of Commerce and Industry.

Vacancies shall be filled by a majority decision of the above named permanent members. Retiring members of the Board shall be eligible for reappointment. No fee as to income, or cost reimbursement is due on the institute for Board members.

Article XV - The Board shall hold regular monthly meetings and such other meetings as deemed necessary in the best interests of the Institute. Meetings shall be concerned in writing by the Chairman of the Board or by the Secretary of the Board acting on his behalf; each convocation shall contain the agents of the business before the Board.

Article XVI - The Administration of the Institute is the totality of the professional staff and administrative employees engaged in furthering the Institute's objectives.

Article XVII - The Administration of the Institute shall be headed by a competent individual appointed by the Board of Directors and responsible to it, and who shall be designated "Institute Director". The Institute Director shall be the Secretary of the Board of Directors.

Article XVIII - The Director of the Institute is charged with the conduct of Institute business and execution of the decisions of the Board of Directors. He is further charged with establishing the operational procedures and rules in the Institute and controlling all the activities of its various divisions; and he shall have commensurate power and authority to carry out his duties.

Article XIX - The duties of the Institute Director are as follows :

1) Operations and Activities

(a) He will control and coordinate operations and activities, formulate and approve operating plans, foster economy in the Institute's financial interests, and assure the best possible use of its facilities, services and equipment.

(b) He will formulate and approve administrative operational procedures at the Institute.

(c) He will approve Institute proposals and the outside contracts pertaining thereunto, as well as purchase contracts and other commitments, and ratifies all through his signature.

2) Organization

(a) He will approve the Institute's organizational plan as well as necessary later changes therein, and sees to their execution. He shall be prepared at all times to improve such plans.

(b) He will approve the additions, elimination, or alteration of positions at the Institute.

(c) He will approve the salary and wage systems at the Institute.

3) Personnel and Employment

(a) He will formulate and approve personnel policies.

(b) He will approve the appointment, promotion and release of personnel.

(c) He will approve vacation leave and absence due to personnel incidental circumstances.

#### 4) Finance

(a) He will prepare the yearly budget and any other requested by the Board and submit them to the Board for approval, accompanied by the necessary recommendations.

(b) He will approve payments disimbursed from the appropriations included in budgets approved by the Board.

(c) He will approve expenses reports submitted by Institute personnel, including his own, for amounts spent while on official Institute business.

#### 5) Public Relations

(a) The Institute Director shall endeavour to establish and foster good relations with the Government, foreign institution, commercial and industrial corporations and with clients and the public in general. It is also his duty to coordinate the efforts of divisional heads and to provide them with assistance and council.

### Chapter Three

#### Finance and Financial Organization

Article XX - The income of the Institute shall be derived from the following sources :

- 1) Payment for services rendered by the Institute.
- 2) A yearly subsidy by the Lebanese Government granted to the Institute as per the provisions of the annual state budget.
- 3) Other grants, contributions or bequests from individuals and organizations both national and foreign, such grants, contributions, or bequests being subject to acceptance by formal decision of the Board of Directors in each separate case.



Article XXI - The director shall submit to the Board, before December first of each year, an annual budget for study and approval before the New Year. The budget so submitted shall detail the estimated income from, and the appropriations requested for each of the principal activities of the Institute.

Article XXII - The Director shall prepare a semi-annual financial report comprising a profit and loss statement as well as the balances sheet for the six-month period covered by the report, and he shall submit to the Board for adoption.

Article XXIII - The Board shall designate the procedure to be followed in effecting payments and accepting receipts.

Article XXIV - The institute shall endeavour, in the shortest possible time, to become financially self sufficient, self sufficiency being defined as the state when the Institute's income permits it to dispense, in its normal budget, with such financial aid as detailed in paragraph (3) of Article XX above, and when the subsidy of the Lebanese Government shall not amount to more than 20% of the Institute's total budgetary income.

#### Chapter Four

##### Aims and Means

Article XXV - The activities and services of the Institute shall be so organized as to realize the following aims :-

- 1) To conduct studies and research relevant to the establishment of new industries.
- 2) To investigate and disseminate information about available raw materials with a view to defining their uses and establishing the best means for their exploitation.

- 3) To provide specialized technological management and economic consulting services to existing industries and projects of industrial development.
- 4) To provide, on an international level, reliable services in testing and analysis and to issue certificates of quality or of conformity with standards and specifications.
- 5) To maintain close cooperation with official institutions, industrial organizations and development boards both on the national and international levels, and in all matters relating to the industrial organizations and development boards on the national and the international levels, and in all matters relating to the industrial development of Lebanon.

Article XXVI-In providing its services and facilities, the Institute shall adhere to the following ethical and professional standards :

- 1) To safeguard, under all circumstances, the sponsor's best possible interests.
- 2) To regard as the sponsor's property any information, processes, patents or techniques developed during work for him and to safeguard such matters in complete secrecy.
- 3) To decline a project for which it considers itself to be not fully qualified.
- 4) To select Institute staff solely on the basis of merit and competence.
- 5) Towards the purpose of inducing complete freedom from personal bias of the Institute's management and its professional staff, it shall not be permitted for professional staff members and members of the Institute management to hold government or private positions, or retain stock or ownership in profit-making organizations which are likely in any way to influence their decisions on Institute members.

Article XXVII - The Institute's services shall be provided on a cost-incurred basis, in accordance with the principles and scale of fees established by the Board of Directors and reviewed from time to time by the Board. The actual costs and the methods of payment shall be defined in a legally binding contract between the Institute and the party for which the services are to be provided.

Article XXVIII - Within the limits set out in the annual budget, and as it deems necessary, the Institute shall undertake studies and research projects, and shall provide consulting services, on matters of interest to national industrial development in Lebanon, and shall, towards this aim, call for and hold conferences issue and distribute relevant publications. The costs thus incurred shall be met from Institute funds and the results of such studies and conferences made available to the public.

Article XXIX - To realize the aim set forth in this chapter the Institute shall acquire, own and dispose of the following facilities :

- 1) Buildings ;
- 2) Laboratories and scientific instruments ;
- 3) Workshop with their equipment ;
- 4) A library with scientific and technical publications ;
- 5) Equipment for accounting, reproductions and printing ;

Article XXX - The Institute shall constitute a permanent reliable body of experts and specialists supported by another body of administrative staff and accountants which provides internal services and undertake routine work.

#### Chapter Five

##### General Rules and Regulations

Article XXXI - This charter renders null and void all previous charters, agreements and amendments, and supersedes them all as the sole basic charter.

of the Industry Institute.

Article XXXII-This charter shall come into effect as from the date of its registration through the proper channels with the Ministry of the Interior.

Article XXXIII-This charter may be amended by the Board of Directors through a decision of a majority of two thirds of the members of the Board, such amendments as agreed upon becoming effective as from the date of their registration through the proper channels with the Ministry of the Interior.

APPENDIX C

DRAFT LAW

LEBANESE STANDARDS AND SPECIFICATIONS

Chapter One

Standards And Specifications Organization

And Its Functions

Article I - An independent organization for standard, and specification, under the title of "Lebanese Standards and Specifications Organizations" is established in Lebanon, and it is known internationally by its initials "LIBNOR"

Article II - The Lebanese Standards and Specifications Organization alone undertakes the setting of national standards and specifications, its publication and amendment, and giving the right of using the Conformity sign for the standards and specifications.

Article III - The national standards and specifications are to include by way of example and not restriction - the measures, patterns and symbols and quality control of products and commodities, and the means of inspection, testing and analysis, and regulations of professional operations and the rules of technical installations.

Article IV - The Lebanese standards and specifications which are passed by the Organization are optional in principle, but for certain considerations relating to public safety, public health or national interest, and such upon the consent of the Organization Board of Directors, the Government may give any of the Lebanese standards and specifications the legal binding nature by virtue of a degree taken by the Council of Ministers.

Article V - Standards and specifications are set upon a proposal from one of the Members of the Board or any of the special or specialized bodies concerned or one of the Ministries of the State, they are debated and formed within specialized committees set up by the Board for this purpose, then submitted to the Board for approval as valid for publication.

Article VI - The promulgation of the Lebanese Standards and Specifications is published in the Official Gazette once approved by the Organization Board and they are considered national standards and specifications as of the date of their publication.

Article VII - The Lebanese Standards and Specifications Organization has the right to propose to the Council of Ministers the application of the legal binding nature with regards to certain standards.

Article VIII - The Lebanese Standards and Specifications Organization has the right to set draft standards and specifications and make them public without their official publication for the purpose of experimenting their use and validity primary to their official publication and consideration as national standards and specifications.

Article IX - The Lebanese Standards and Specifications Organization has the right to pass amendments deemed fit in any of the national standards and specifications, and that upon the proposal of committees and specialized or official bodies concerned with the affair. The amendment is published in the Official Gazette.

Article X - The Lebanese standards and Specifications organization Board of Directors consists of :

Chairman { The President of Engineers Association in Lebanon.

{ - The Director of the Consumer Protection Service at the Ministry of National Economy and Tourism.

{ - The Director of the Technical Department at the Ministry of National Economy and Tourism.

{ - A Representative of the Agricultural Scientific Research Institute at the Ministry of Agriculture.

Members

{ - A Representative of the Ministry of Health.

{ - A Representative of the Chambers of Commerce and Industry in Lebanon.

{ - A Representative of the Engineers Bi-Associations Union in Lebanon.

- Members { - A Representative of the Association of Lebanese Industrialists.  
          } - A Representative of the Industry Institute.

Article XI - The functions of the Board are distributed as follows :

A - The Board sets the general plan for the activities of the Organization and its project budget and fixes the taxes, fees and duties which it has the right to collect from those concerned. The Board supervises the expenditures and activities, while the execution of the budget and the fixing of the maximum level of fees are subject to the approval of the Council of Ministers.

B - The Board convenes upon invitation from the Chairman or at the request from the majority of its members, and the salaries of the Board are fixed as per session.

Article XII- The Industry Institute ensures the functions of the Secretariat of the Board for a period of three years from the date of publication of this Law and it is up to the Board to appoint the Secretary after the expiration of this period.

Article XIII-The Lebanese Standards and specifications Organization is financed from the following sources :

A - An annual allotment in the general State budget fixed at a request from the Board.

B - Fees collected from inspection and researches and granting of conformity certificates and income from licensing the use of the Conformity Sign for the national standards and specifications.

C - Annual subscription fees in the Lebanese Standards and specifications Organization.

D - Income from the sale of the Organization publications.

E - Private donations and grants.

Article XIV - The Lebanese Standards and Specifications Organization sets a special sign to indicate the conformity of the characteristics of the national products and commodities with the national standards and specifications, and grants the right of usage to those interested within conditions fixed by the Organization which supervises its proper use. One of the Two following forms, or both, is used for the Sign :



"The initials" Lebanese Standards" in Arabic and the initials " Norme Libanaise" in French with a cedar.

Article XV - The Sign is registered in both its forms in Lebanon in accordance with the laws in force and to be registered in foreign countries if need arises and by a resolution form the Board.

Article XVI - The use of the Sign by Lebanese producers or exporters of Lebanese agricultural products is optional and is given to the one interested according to a licence issued from the Organization specifying the conditions and regulations to be adhered to.

Article XVII - The licence of using the sign are issued after ascertaining that the characteristics of the products or materials intended to place the sign on are in conformity with the national standards and specifications determining the type and quality and that the applicant for its use is in a position able to control the quality of his products or materials continuously.



- Article XVIII - Products and materials bearing the sign are subject to inspection and control by the Organization either directly or through bodies or specialized committees delegated by the Organization for this purpose.
- Article XIX - The Organization collects for its own account fee from those who are licensed to use the sign and this fee is to be fixed in the licence certificate.

### Chapter Three

#### General Provisions

- Article XX - The licence to use the Sign is considered as a private contract between the licensed and the Lebanese Standards and Specifications Organization and the provisions of general laws are enforced on him. The sale of any commodity bearing the Sign is considered as an undertaking from the licensed to use the Sign towards the buyer for the conformity of the commodity with the specifications set for this type. The provisions of general laws are enforced on him.
- Article XXI - The Lebanese Standards and Specifications Organization is not held responsible under any circumstances nor towards any private or national official or foreign body as to any action relating to the use of the Sign. The sole person responsible is the one licensed.
- Article XXII - Specialized official departments are to supervise in general the enforcement of the standards and specifications which assume the binding nature.
- Article XXIII - The official departments cannot adopt a procedure in isolation or conflict with the national standards and specifications - except under circumstances provided for in Article XXIV of this Law.
- Article XXIV - The official departments have the right to request the Organization to study the reasons of their wish in non-adherence to the national standards and specifications in their purchase tender books and purchases. If the Organization approves that then such books and purchases are exempted from adherence to the national standards and specifications in each case apart.

- Article XXV - The Lebanese Standards and Specifications Organization represents Lebanon internationally in the field of standards and specifications.
- Article XXVI - The provision of the Law of Prevention of Fraud are enforced in all cases contravening the binding standards and specifications.
- Article XXVII - This Law is enforced upon its publication in the Official Gazette.

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