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**STRENGTHENING THE FUNCTIONING OF INDUSTRIAL
TRAINING INSTITUTIONS IN THE ESCWA REGION**



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PREFACE

The present document was prepared by the Industry and Technology Division as part of the implementation of the 1990-1991 biennium work programme. It attempts to highlight the central role of industrial training in the industrialization of the Western Asian region. The study takes into account the stage of industrial development reached by concerned member countries and aims ultimately at establishing mechanisms and institutions and at assisting in building up coherent and comprehensive training systems through the development of adequate methodologies for human resources development and training needs for industrial specialists, managers, supervisors and for the dissemination of information relevant to industrial training.

The study and field survey was conducted in 1990 in three member countries, Egypt, the Syrian Arab Republic and Jordan. It provides details on current industrial training programmes, facilities and equipment available in the various training centres, an overview of vocational training in the three countries, an assessment of problems and obstacles facing institutions involved in training, and finally future trends and prospects for their expansion as Governments and industrial enterprises aspire to develop a regional strategy for training industrial manpower.

The purpose of the study was to stimulate discussion among experts in an expert group meeting intended to be convened in 1991; this meeting was cancelled due to events in the region. The participants were expected to share their experience in industrial training within the region, and to adopt recommendations aimed at promoting the level and range of industrial training programmes and cooperation among the member States.

INTRODUCTION

1. Objective of the study

The study was conducted by the Economic and Social Commission for Western Asia (ESCWA) to assess the functioning of existing industrial training institutions in Egypt, Jordan and the Syrian Arab Republic and to identify major problems and issues facing them and to suggest ways to improve their performance.

2. Scope of the study

The study was conceived by ESCWA to cover the entire ESCWA region. Accordingly, five countries representing the ESCWA region were chosen, namely Egypt, Iraq, Jordan, Kuwait, and the Syrian Arab Republic. However, due to the Gulf crisis, it was not possible to undertake field missions in Iraq and Kuwait; they are therefore not included in this study.

The scope of the study covers the following components of industrial training:

(a) Technical and non-technical training in areas relevant to the industrial enterprise, i.e., engineering, science, technology, management, finance, marketing, etc.;

(b) Specialized, sectoral and multi-sectoral training centres serving the industrial sector wholly or partially;

(c) Training at various organizational levels in the industrial enterprise, i.e., top managers, middle managers, engineers, and supervisors;

(d) Participation of women in the training function, both as trainees and trainers;

(e) Vocational training; this area was not meant to be covered in this study, yet because of its relevance to the industrial enterprise, it was briefly assessed and is presented in the annexes.

3. Plan of work

Field-work was undertaken in Egypt, Jordan, and the Syrian Arab Republic. Visits were made to ministries of industry and to institutes, departments, and centres involved in industrial training. Discussions were carried out with a large number of officials in those institutions, who contributed a wealth of information, and identified many problems facing industrial training and proposed solutions.

4. Organization of the report

Chapters II, III and IV describe current industrial training in Egypt, Jordan, and the Syrian Arab Republic. Chapter V identifies major problems and issues facing industrial training in those countries and presents some ideas on how to deal with them. Annexes I, II, and III briefly describe vocational training in Egypt, Jordan, and the Syrian Arab Republic, whereas annex IV lists literature collected during field missions.

I. GENERAL COMMENTS ON MANPOWER REQUIREMENTS FOR INDUSTRIALIZATION IN WESTERN ASIA

The development of indigenous human resources in industrial production is considered to be the most important issue for the growth of industrial development. The direction and growth of the industrialization process are determined by the availability of suitably qualified manpower in sufficient numbers and with adequate technical knowledge and practical skills.

Egypt and the Syrian Arab Republic have developed heavy industries, such as iron and steel, metallurgical and engineering industries. They have, along with Jordan, developed light industries, such as chemicals, building materials, textiles, food processing and leather industries. Still these countries depend heavily on exports of raw mineral resources and imports of a wide variety of capital goods, equipment, food and textile items. The industrialization process adopted by Jordan has mainly focused on resource-based industries and import substitution. While emphasis in Egypt and the Syrian Arab Republic appears to have been placed on engineering industries, including transport equipment and heavy industries, along with the support services required for design, research and development, and training and testing facilities. Jordan has a much smaller industrial sector and is more dependent on resource endowments.

The size of the industrial sector in ESCWA member States is very small compared to other countries and regions. For example, Egypt has the deepest-rooted industrial base among Arab States and developing countries, and yet the size of its industrial sector compares with the size of Hong Kong. Therefore the challenge of developing the industrialization process and indigenous manpower is of great relevance to the economic development of the ESCWA region.

For 1990, the highest contribution of manufacturing industries' income to gross domestic product (GDP) is found in Egypt, estimated at around 15.4 per cent. In the Syrian Arab Republic and Jordan, the level is relatively lower, 13.8 and 7.9 per cent, respectively.

The high performance of the manufacturing sector in Egypt is attributed to increased output in the fabricated metal industries and partly to the favourable effects of the restructuring policy and liberalization measures that were introduced in Egypt in 1988. All this has improved export performance and has facilitated access to local and imported raw materials.

In the Syrian Arab Republic, the growth of the manufacturing sector is influenced by oil-refining activities and industrial support services.

Jordan suffered acute contractions in its manufacturing activities since 1988 as a consequence of the introduction of readjustment policies and the devaluation of the Jordanian dinar.

The priorities set for the development of human resources in the Western Asian region cannot be evaluated here in detail due to scarce relevant information, but we can ascertain that all fields of knowledge and experience

related to the industrial production process -- whether technical skills, management or maintenance -- are needed in the region and have to be evolved. Qualified manpower is needed to identify, evaluate, supervise and manage industrial enterprises. Skilled and experienced manpower in the industrial sectors that were established decades ago in the region have to be promoted continuously and their capabilities regularly upgraded to keep up with the current rate of global industrial and technological developments.

It is general knowledge that the education and vocational training systems in the region have not adequately provided for training in the specialized skills needed by such workers as production engineers, corporate managers, process and product-design engineers and technologists.

As a rule, the ESCWA member countries have small and young populations. In 1990 the estimate for the total population in the region was approximately 127 million, with a potential manpower of 65 million; the actual economically active population did not exceed 22 million, however.

In the three member States under study -- Egypt, the Syrian Arab Republic and Jordan -- where the majority of trained and skilled manpower is located, it was found that the active population in 1989 was approximately 31 per cent of total population in Egypt, and 23 per cent in both the Syrian Arab Republic and Jordan. Available information on the manufacturing industries indicates that in 1989 the manufacturing sector in Egypt employed only around 968,000, in the Syrian Arab Republic 130,000 and in Jordan 45,000 -- that is a total of about 1.1 million workers only.

Labour-force composition

	<u>Egypt</u>	<u>Jordan</u>	<u>Syrian Arab Republic</u>
Labour force as a percentage of total population (1989)	31.6	23.1	23.9
Women in labour force as a percentage of total labour force (1989)	13.5	9.9	6.8
Labour in industry:			
1965	15.0	26.0	20.0
1988	13.4	25.6	16.0

The above table indicates that the percentages of labourers industry has not changed drastically in the past 20 years. Labour-force distribution between males and females shows that the female work-force as a percentage of the total labour force does not exceed 13.5 per cent in Egypt, 9.9 per cent in Jordan and 6.8 per cent in the Syrian Arab Republic. In the manufacturing industries, the majority of the working force in the three countries are male workers; in fact, less than 1 per cent are females.

The potential for women's participation in industrial employment has been largely unrecognized. Tradition and the lack of technical and industrial training for women has weighed heavily, leaving a big female-male gap in acquired skills and figures of employment. More needs to be done to enable women to participate fully in the formal education system, especially in the scientific fields, the vocational training programmes and the industrial and technological fields.

Unemployment rates have been on the rise in ESCWA labour-sending countries, mainly Egypt, Jordan and the Syrian Arab Republic since the mid-1980s. This was attributed to a number of factors, mainly:

- (a) High population growth rates;
- (b) Recessionary conditions in the Gulf Cooperation Council (GCC) countries during the period 1986-1989, leading to fewer employment opportunities;
- (c) Implementation of adjustment policies aimed at correcting structural economic imbalances in Egypt and Jordan;
- (d) Receiving a large number of expatriates who previously worked in the Gulf countries.

The unemployment level in Jordan and Egypt is approximately 20 per cent of the national manpower and in the Syrian Arab Republic averages 10 per cent.

At the same time Egypt, Jordan and the Syrian Arab Republic have provided skilled and unskilled labour for the oil-rich countries of the region for the past four decades. This has had both negative and positive effects on the general economic development of both subregions. The high manpower demand in the oil-rich countries pulled the best-trained and most experienced personnel in the three countries at the same time that it provided them with new job opportunities, experiences and better financial incentives.

Efforts to develop industrial training institutions, as outlined in the present study, have been under way since the early 1970s, with the aim to promote the development of human resources as a main factor for promoting industrialization. The analysis of the issues included in this study has been undertaken to provide a framework for formulating action-oriented resolutions and recommendations.

The expansion and diversification of industrial training centres has not been directly related to the needs of the industrial labour market, and industrial enterprises do not directly determine the training, specialization or number of candidates in each professional training centre.

The relation between the capabilities of industrial training institutions in the region and industrial labour-market needs has not been extensively developed in this paper due to information constraints. But it is clear that some of the industry's requirements for skills are not adequately met by the market. Trainees, with badly-needed qualifications and specializations find

opportunities for work, while graduates of training and education programmes in general engineering need more specific technical skills to be absorbed by the industrial sector.

Studies undertaken in other, similar subregions have shown that industrial support institutions must be set up to provide for the educational, training, research and support services that a given region needs if it is to achieve self-sufficiency and self-sustained industrial development, and that provision must also be made for appropriate instruments to coordinate, conduct and monitor the development of industrial manpower and to secure an effective mechanism for consultation and cooperation among member States, industrial enterprises and training institutions.

II. INDUSTRIAL TRAINING IN EGYPT

Training in Egypt is carried out by six institutions in the fields of administration, management, economics, science, and technology. They are:

Sadat Academy for Management Sciences
Managers Development Centre for Industry
National Research Centre
Industrial Design Development Centre
El-Tabbin Institute for Metallurgical Studies
Productivity and Vocational Training Department

A. Sadat Academy for Management Sciences

One of the main objectives of the Sadat Academy is to strengthen the analytical concepts of management and improve the performance of production units. Specifically, it aims at developing managerial skills at all levels, including those of top managers, middle managers, line supervisors, etc. Its training activities encompass the public, governmental, and private sectors, and extends to other Arab and African countries; one of the objectives of the Academy is to exchange services and technical aids in the field of managerial development with other countries and international organizations and institutions.

The Academy has four centres: the training centre, the consultation centre, the research centre, and the local administration centre. Its activities are carried out through its main office in Ma'adi, and six branch offices in Garden City, Ramses, Assyout, Tanta, Alexandria, and Port Said.

The main training programmes are carried out at the main office and the Tanta branch. The Garden City and Assyout branches are used mainly for local government training. Language training and computer courses are given at the Ramses branch, whereas the Alexandria and Port Said branches are engaged in all activities of the Academy.

The Sadat Academy offers training according to two modalities:

(a) An annual plan which it prepares and distributes among all companies concerned, which in turn nominate candidates to the various training programmes;

(b) Special programmes prepared upon the request of interested parties. Invariably those programmes represent an extension to or a consequence of training sessions given under the annual plan.

The Academy receives fees from the end-users for its training activities and other services. It does not receive any financial support from the Government. This causes financial difficulties for the Academy, but at the same time helps in keeping its decision-making independent.

The 1990-1991 training plan included the following programmes:

(a) Top management: leadership skills, negotiation skills, strategic planning, problem analysis and decision-making, information systems, new trends in financial management;

(b) Executive management: development of executive leaders, feasibility studies, planning and execution of projects, information systems management, etc.;

(c) Supervisory management: development of supervisors, management of purchases and stores, marketing research, planning and execution of training, etc.;

(d) Sectoral management: tailored to the needs of requesting companies in the public, governmental, and private sectors. It may include elements from all of the above programmes;

(e) Computers: computer languages, programing, use of computers in practical and scientific applications, etc.

Each of these programmes consists of a number of elements. The training session corresponding to a programme element ranges from days to weeks, and the fees per trainee for attending one session may exceed \$US 300.

All activities of the Academy, including training, are undertaken by a large pool of professionals, including professors and lecturers. The Academy continuously upgrades the skills of its staff through exchanges of visits with similar foreign institutions.

The Academy is managed by a Council headed by its president and comprised of two vice-presidents, the deans of the centres and branches, two deans of the faculties of commerce in Egyptian universities, two experts in the area of managerial development, the director of the National Planning Institute, the head of the National Institute for Management Development (NIMD), graduate societies, a representative of the Central Agency for Organization and Administration, a representative of the Ministry of Local Government, and a representative of the Council of State. However, the Council (of the Academy) does not include representatives of the industrial sector who would strengthen coordination between the Academy and industry.

B. Managers Development Centre for Industry

Realizing the role of management as a key factor in economic development, the Egyptian Government decided to develop competent leaders to manage production units in the country. Thus, the idea emerged to establish a special training centre to prepare the managers needed by industry. Subsequently, work began to set up the Managers Development Centre for Industry in 1987, and the Centre began operating in February 1990.

The Centre maintains adequate linkages with the industrial sector, both public and private. Its Board of Trustees is chaired by the Minister of Industry; its instructors are chosen from industry, each having from 10 to 15 years' work experience and a solid scientific background in the field of management.

In addition, the Centre utilizes the services of consultants and advisors from academic institutions and the Egyptian business sector.

The Centre maintains strong linkages with similar foreign institutions. In fact, when the Government decided to establish it, teams of Egyptian experts and scientists visited a number of well-known institutions, i.e., the Ahmedabad Institute in India, Insead Institute in France, and the Harvard Business School in the United States in order to benefit from the experiences of other countries.

Trainees are selected from applicants wishing to prepare themselves to occupy positions of leadership in the industrial sector; they must not be older than 55 years of age. Their successful completion of the training programme is a basic condition for their promotion. Trainees are engaged in training on a full-time basis, and are considered to be on an internal mission and thus continue to receive their entitlements and benefits. Their progress is monitored and evaluated weekly, and the ones with the best performance are sent to companies in Europe and the United States, similar in nature to their own, for periods ranging from four to six weeks.

The Centre is well equipped with training aids such as videotapes and computers. The training material is practical in nature and stresses case-studies. In addition, each trainee must select a problem relating to the work of his company and develop a suitable solution for it.

The Centre offers long-term and short-term training programmes. The long-term programme aims at preparing and developing capable managers to lead industrial projects. Trainees are therefore exposed to diversified topics, namely:

(a) Challenges to management: real case-studies are presented by experts from industry;

(b) Information systems management: to organize available data, to analyse it and to use it in decision-making. This topic also includes using computers in various applications such as financing, marketing, accounting, production, etc.;

(c) Production and productivity systems: to plan and implement production operations and to acquire an understanding of the various production components, i.e., inventory control, quality control, material handling and movement. In addition, it deals with local and export marketing, competition, incentives, and other factors relevant to the progress of the industrial enterprise;

(d) Financial management: financial analysis by means of computers, loans, liquidity, comparative cost studies of similar projects, etc.;

(e) Management of human resources: motivation of staff, incentives, etc.;

(f) Strategic planning: key decisions relating to the future of the enterprise, the rationale behind decisions and plans necessary to implement them;

(g) Final project: each trainee selects one problem relating to the work of his company, or its type of business, and utilizes the knowledge he acquires at the Centre to solve it.

The durations of the various sessions of the long-term programme are shown below:

Challenges to management	98 hours
Information systems management	128 hours
Marketing management	152 hours
Product management	170 hours
Management of financial resources	158 hours
Management of human resources	104 hours
Strategic planning	36 hours
Final project	144 hours

The long-term programme covers 34 weeks of training in the following sequence:

Weeks 1-3	Weeks 4-28	Week 29	Weeks 30-34
Challenges to management	Information systems	Strategic planning	Final report
	Marketing management Production management Management of financial resources Management of human resources		

The short-term programme is directed to top managers and focuses on selected modern management techniques that have been successfully applied in industrial enterprises.

C. National Research Centre

In 1983 the Government passed Law no. 115 for establishing a training centre to create and upgrade a large pool of manpower in diversified skills. Accordingly, it was decided in 1985 to set up a training centre affiliated with the National Research Centre.

The stated objectives of the training centre were:

(a) To develop trained manpower, and thus to utilize available manpower resources efficiently;

(b) To upgrade and strengthen the level of skills of the existing work force;

(c) To link the services and production functions with scientific research in order to develop well-trained personnel capable of solving the problems they face.

The training programmes at the Centre focus on practical applications rather than academic theories and aim at serving and supporting developmental projects. Each training session lasts between one and two weeks and includes lectures and sometimes practical training at the well-equipped facilities of the Centre. All lecturers and instructors are from the National Research Centre, which has about 6,000 staff members of whom 1,000 hold doctorate degrees. Enrolment in the different training sessions ranges from 7 to 20 participants. At the end of each session, the Centre organizes an open seminar in which the participants express their views and offer suggestions concerning the training session they attended, including the contents of the training programme. The Centre takes these opinions into consideration when it prepares plans for subsequent sessions.

The Centre maintains close linkages with Egyptian universities, since almost 30 per cent of its staff teach at the universities. It also maintains scientific cooperation agreements with many Arab and foreign scientific institutions. Its relation with industry is very close, and whenever needed, its staff organize training sessions at the facilities of industrial enterprises. The Centre accepts trainees from Arab countries; e.g. a large number of Libyans have benefitted from its training programmes. The Centre strives to play a leading and substantive role in the Arab world.

The Centre receives fees from participants to cover actual training costs only. It charges 300 Egyptian pounds per participant per week from Egyptians, and an equivalent amount in United States dollars from Arab and foreign participants.

Training was undertaken as part of the 1989/1990 annual plan in the following areas:

(a) Food industries, e.g. smell and taste additives;

(b) Agricultural and animal resources, e.g. use of genetic engineering to improve plantation;

(c) Hygiene and environment, e.g. chemical and biological bases for water-treatment technology;

(d) Chemical industries, e.g. manufacture of soap;

(e) Electronics, e.g. fundamentals of electronics;

- (f) Textiles industries, e.g. technology and engineering of weaving;
- (g) Computers, e.g. introduction to computers;
- (h) Use of scientific and industrial equipment;
- (i) Scientific policies, e.g. the role of patents in technological development;
- (j) Metals;
- (k) Energy and mechanical engineering;
- (l) Production, e.g. utilization of statistics in quality control;
- (m) Special training, e.g. technology of welding.

The above areas were covered in 80 training sessions in which 345 outside trainees and 126 trainees from the Centre participated. The sponsors included 70 companies and industrial enterprises, 80 universities, 30 ministries and government agencies, and 3 Arab countries. The fees received by the Centre amounted to 108,355 Egyptian pounds.

Overall, the Centre held 114 training sessions, including 90 language sessions, for 767 trainees during 1989/1990. On the average, the Centre holds 80 sessions annually, with an average of 10 participants per session. It should be noted in this respect that the number of participants in the training programmes could increase substantially if accommodations could be provided for out-of-town participants. However, the Centre has not been able to provide such facilities because of financial constraints.

D. Industrial Design Development Centre (IDDC)

IDDC was established in 1968 as a joint project between the Egyptian Government and the United Nations Development Programme (UNDP). On the substantive level, the linkages between IDDC and the United Nations have been with the International Labour Organisation (ILO) and the United Nations Industrial Development Organization (UNIDO).

In addition to technical training, the Centre is engaged in the following areas: product design and development relating to consumer electronic goods; design and production of tools; design of certain capital equipment such as concrete mixers; industrial and engineering computer applications such as CAD/CAM; industrial information services with linkages to local and international data banks, e.g. Georgia Institute of Technology; special studies and technical advisory services to assist industrial enterprises; design and implementation of modern management systems including quality control and maintenance management systems; extension services for small- and medium-scale industries, with the support of UNDP, ILO, and UNIDO; and research and development (R and D) in electronics.

IDDC employs more than 120 highly qualified and experienced engineers to carry out all its activities, including training. Its training facilities are well equipped and contain audio-visual aids and instantaneous translation equipment. These facilities are located in the main office in Cairo and in the Centre's two branches in Dar-el-Salaam.

IDDC receives training fees on a cost-only basis. The income generated from training amounts to about 200,000 Egyptian pounds per year, and part of this income is used to pay trainees and instructors. It should be noted that the Government does not contribute any money to the training budget, although it contributes funds for the other activities of the Centre, amounting to 60 per cent of the total budget.

IDDC has a high committee for training composed of the General Director of Training and the General Directors of planning, design, and advisory assistance at the Centre. This committee is responsible for all aspects of training. The Centre itself is affiliated with the Public Sector Organization for Engineering Industries, which is part of the Ministry of Industry.

Training at IDDC, as with its other activities, is aimed at both the public and private sectors. In fact, the Centre -- true to its original conception -- tries to strengthen the private sector and consequently subsidizes part of the fees levied from the private-sector trainees.

IDDC holds about 60 regular training sessions per year. The training programmes are based on the results and analysis of the Centre's diagnostic studies on the industrial sector. In addition it holds special sessions upon the request of industrial companies on, for example, preventive maintenance, telemetry, etc. Such sessions are held at the facilities of the requesting companies. Roughly speaking, a training session is one-third theory and two-thirds practice, and lasts from two to four weeks. IDDC also undertakes joint activities with United Nations organizations; for example, a joint workshop on computer applications in industry was organized with ESCWA and UNIDO.

The training plan of IDDC during 1990/1991 consisted of the following programmes:

1. Industrial management

(a) For engineers: feasibility studies, planning industrial projects, product design, production planning, quality control systems, management, etc.;

(b) For technicians: management of mechanical workshops, inspection and quality control, production technologies, etc.

2. Maintenance

(a) For engineers: organization and execution of maintenance, design and testing of cranes, etc.;

(b) For technicians: maintenance of electrical equipment, workshop equipment and tools, air-conditioning principles, etc.

3. Automatic and hydraulic control systems

(a) For engineers: design of hydraulic and pneumatic control systems;

(b) For technicians: design and maintenance of hydraulic and pneumatic control systems;

4. Testing

(a) For engineers: analysis of the reasons for material collapse;

(b) For technicians: inspection and welding tests, heat treatment of steel.

5. Mechanical drawing

For draftsmen: reading of engineering designs, upgrading drafting skills.

6. Production processes

(a) For technicians: operation time calculations, new techniques in milling and turning operations, etc.;

(b) For engineers and technicians: plastic and metal mould design, etc.

7. Welding

(a) For engineers: welding technology;

(b) For technicians: argon gas welding, welding technology based on electric resistance, etc.

8. Computers

(a) For engineers and specialists: basic computer languages, computer applications in costing, etc.;

(b) For engineers and draftsmen: computer applications in engineering drawing.

9. Electronics R and D

(a) For engineers: design of electronic systems, integrated circuits and their applications, thyrestors and their applications, etc.;

(b) For technicians: fault tracing, operation of measurement equipment, reading electronic circuits, etc.

The number of trainees per year is about 800 to 1,000, of whom 50 per cent are engineers; the rest are senior technicians holding key positions in their companies. All trainees must be working in the industrial sector. Women represent about 50 per cent of engineer trainees, 20 per cent of

technician trainees, and over 50 per cent of the instructors, who are all engineers. The percentage of women engaged in training correlates with the ratio of women graduating from engineering colleges in Egypt, especially in fields such as electronics.

The training function could be strengthened if the following suggestions were implemented, according to IDDC officials:

(a) Up-to-date scientific training material and equipment should be acquired. However, IDDC does not have the necessary funds;

(b) IDDC ought to be free to spend the income generated from training as it sees fit, without the existing red tape imposed by the Ministry of Industry.

E. El-Tabbin Institute for Metallurgical Studies

The Institute was set up based on studies prepared by the Soviet Government, following discussions to set up an iron and steel complex and to expand existing chemical industries. It became operational in 1968 and in 1975 became affiliated with the Ministry of Industry.

The Institute has a Board of Directors composed as follows:

(a) Chairman: Chairman of the Board of the Public Sector Organization for Metallurgical Industries;

(b) Members: First Deputy Minister of Industry, Director of the Institute, Director of the Metals Research Centre representing the Academy of Scientific Research and Technology, three chiefs of divisions at the Institute, and four part-time professionals from metallurgical industries.

The Institute also has a scientific council formed annually of four members from outside the Institute, with backgrounds in industry, university, and scientific research. It should be noted that the composition of the scientific council and the Board of Directors indicates strong linkages between the Institute and industry.

One of the main objectives of the Institute is to develop specialists in metallurgical, mining, and chemical industries in order to operate and manage production units. Other objectives include preparation of scientific and technological studies, scientific and applied research relating to iron and steel, organization of missions within and outside the country, and publication of research work and studies on the metallurgical and mining industries.

The Institute develops specialists through its continuous education programme, which covers 12 fields. This programme includes study programmes for college graduates, training sessions for specialists at the Institute or in the production units, enrolment for M.Sc. and Ph.D. degrees at Egyptian and foreign universities, and scientific and practical training locally and abroad.

Graduates of the continuous education programme from 1970 to 1990 amounted to 735 specialists, of whom more than 650 obtained the High Studies Diploma (which is equivalent to an (M.Sc. degree) at El-Tabbin Institute. However, available statistics show a substantial decrease in the number of graduates beginning in the 1980s, as compared to the 1970s. It also indicates that graduates were distributed among the various specializations as follows:

	<u>Number of graduates</u>
Ferrous metals	117
Mechanical equipment	105
Automatic control	89
Economics	77
Heat treatment	70
Rolling	66
Casting	59
Mining	46
Industrial furnaces	40
Chemical engineering	31
Non-ferrous metals	18
Welding	14

The number of graduates, classified according to the type of companies or organizations, is given in the list below, which also shows the number of non-Egyptian graduates:

	<u>Number of graduates</u>
Metallurgical industries	546
Engineering industries	17
Chemical industries	34
Mining industries	26
Textiles industries	10
Military production	36
Arab countries	18
Others (including African States)	48

The continuous education programme includes also the following types of training:

- (a) Short training sessions (one to two weeks);
- (b) Special training sessions held at the facilities of the production units;
- (c) Long training sessions (up to three months);
- (d) Highly specialized programmes covering technical and technological areas;
- (e) Preparatory programmes for recent graduates of the colleges of science, engineering, commerce and economics who are nominated to work in the industrial sector.

The numbers of short training sessions and special training sessions held at the facilities of the production units from 1979 to 1990 are shown below:

	<u>Number of sessions</u>	<u>Number of trainees</u>
1979/1980	11	66
1980/1981	22	152
1981/1982	12	97
1982/1983	42	299
1983/1984	48	483
1984/1985	5	148
1985/1986	21	153
1986/1987	69	747
1987/1988	54	584
1988/1989	13	144
1989/1990	33	151
<hr/>		
Total	330	3,024

F. Productivity and Vocational Training Department (PVTD)

PVTD was established in 1957 by the Ministry of Industry with the objective of improving productivity through the introduction of modern methods and techniques. Moreover, PVTD is responsible for training large numbers of manpower needed by industrial enterprises and by its own centres.

The training programmes of PVTD consist of the following:

- (a) Training engineers and specialists (middle managers);
- (b) Vocational training, and training of instructors.^{1/}

The training programme for engineers and specialists consists of the following elements:

1. Production engineering (52 weeks):

	<u>Number of weeks</u>
Methods for improving productivity	2
Work study	11
Study of performance	4
Measurement of work	4
Planning and follow-up of production	7
Organizing preventive maintenance	7
Scientific methods of quality control	8
Quality control	3
Preventive maintenance for technicians and foremen	3
Measurement of work and study of performance	3

^{1/} Refer to annex I, Vocational Training in Egypt.

2. Economic research (48 weeks)

	<u>Number of weeks</u>
Industrial costs for specialists	5
Industrial costs for non-marketing personnel	2
Marketing research	3
Export marketing	3
Art of selling	3
Procurement and stores	3
Marketing performance	7
Evaluation and monitoring of performance	12
Scientific methods for monitoring and evaluating performance	4
Modern methods for procurement control	3
Industrial costs for workers in various parts of the factory	3

3. Supervisory training (31 weeks)

	<u>Number of weeks</u>
Human relations	4
Work communications	3
Simplification of work	3
Work safety	3
Selection of personnel	2
Measurement of productivity	2
Training management	3
Out of training	4
Modern methods of supervision	4
Administrative development	3

4. Industrial safety (5 weeks)

	<u>Number of Weeks</u>
Industrial safety for production personnel	3
Industrial safety and accident prevention	2

PVTD maintains work relations with ILO and the British Council. It has received grants from the European Economic Community (EEC), United States Agency for International Development (USAID), the German and Italian Governments and has received soft and commercial loans from the Development African Bank and the World Bank in order to upgrade its entire training capabilities, including vocational training, which represents its major training component. On the other hand, it has not developed any linkages with other Arab countries.

PVTD ensures accurate and up-to-date information on the needs of industry through its contacts with capable professionals working in industrial enterprises. It also relies on its formal linkages with those enterprises through its regional consultation councils, which are chaired by the presidents of industrial enterprises operating in the districts concerned, and the High Consultation Council whose chairman is the Minister of Industry.

PVTD encounters financial difficulties which constrain its ability to acquire the necessary training aids and equipment, and seeks funds from the Ministry of Industry. Invariably it gets little money, if any at all.

III. INDUSTRIAL TRAINING IN JORDAN

Two institutions undertake industrial training in the country:

(a) Jordan Institute of Management, which carries out training in the fields of administration and management;

(b) Royal scientific Society, which carries out training in the economic and technical fields.

A. Jordan Institute of Management

The Government decided to establish the Institute of Management, within the Industrial Development Bank, in order to serve the institutions and industrial enterprises of Jordan's private sector. The Institute began to function in 1979, and later on it expanded its coverage to encompass public-sector companies.

The stated objectives of the Institute are:

(a) To train middle managers in scientific methods and practical applications in management, accounting, production, marketing, and other fields;

(b) To provide advisory services to private-sector companies and industrial enterprises in order to modernize them and to solve their specific problems;

(c) To provide economic and statistical information on the performance of the national economy in all sectors;

(d) To publish research and studies pertaining to modern management methods, and to assess their applicability to the local environment.

The Institute prepares an annual training plan comprising 80 to 90 programme elements in five fields: management, finance and accounting, production, marketing, and computers. The plan is prepared by the staff of the Institute with guidance from studies conducted to determine the needs of the national market, and the views and suggestions of trainees at the end of each session. Moreover, the special training programmes that the Institute designs and executes for individual companies at their requests is another source of information for determining those needs. In addition, visiting university professors contribute to the process of preparing the training plans.

The annual plan is then mailed to public- and private-sector companies and industrial enterprises in Jordan and in some Gulf States. Industrial enterprises and companies nominate some of their staff to attend the training programmes in accordance with conditions established by the Institute.

The length of training sessions varies from one week to more than two weeks and the fees charged by the Institute to industrial enterprises is about 90 Jordanian dinars (JD) and JD 180 per trainee, respectively. The number of trainees has been increasing steadily, reaching 1,180 during 1990.

B. Royal Scientific Society (RSS)

RSS was established in 1970 as the leading centre for applied research in Jordan. Since then, it has oriented its activities to satisfying the needs and priorities of the country. This has been reflected in the scope and nature of its activities and specializations, including training.

Training at RSS is decentralized. Separate training programmes are developed by its various centres. These programmes are then combined and published in the form of an annual training plan. The centres in question are:

Computer Technology, Training and Industrial Studies Centre
Mechanical Design and Technology Centre
Building Research Centre
Renewable Energy Research Centre
Industrial Chemistry Research Centre
Economic Research Centre
Electronic Services and Training Centre

Some of the training programmes of the last three centres listed above fall within industrial training, as explained below:

1. Industrial Chemistry Research Centre. Training in this Centre began in 1990, during which two sessions were held, one on the evaluation of rocks and minerals for industrial use, and the other on using spectroscopic methods to identify trace elements. In 1991 the Centre held four sessions, on X-ray fluorescence techniques, on the production and use of paints, on evaluating rocks and minerals for industrial use, and on specifications and applications of mineral oils. Each session lasted up to five working days and was divided between theory and practical training at the Centre's laboratories. About 15 trainees participated in each session.

The Centre invites national institutions and companies to nominate trainees to attend its training sessions and specifies the necessary qualifications of the trainees, who normally must have at least a bachelor's degree in chemistry or chemical engineering. The Centre charges fees for its training programmes, on a cost-only basis; the fees per trainee in 1991 were in the range of JD 100-150.

The Centre normally takes the initiative in formulating its training programmes, based on its staff's assessment of the needs of the country. However, it also holds special training sessions upon the request of other national institutions: for instance, in 1991 a session on the use of computers to evaluate industrial minerals was held for Phosphates Co. staff, and in 1992 a session on textiles will be held upon the request of companies in that sector. In general the Centre may prepare training programmes relating to its areas of specialization, which include:

Agro-food laboratory
Detergents and soap laboratory
Textiles and paper laboratory
Inorganic raw materials laboratory
Paints laboratory
Mineral oils laboratory
Analysis laboratory

2. Economic Research Centre. This Centre began offering training in a systematic manner in 1985. Prior to that, training was carried out on an ad hoc basis. Its 1990 training programme consisted of three elements: one on project investment analysis, one on monitoring, evaluation and sustainability of project benefits, and one on appraisal and management of industrial projects. The last two elements comprised the 1991 training programme. Each training session lasted between 10 and 22 working days and was attended by 20-30 trainees holding university degrees in relevant fields. It should be mentioned that before the Gulf War, 75 per cent of the trainees were non-Jordanians, whereas this percentage declined to 15 per cent after the war.

The Centre charges fees for its training programmes, on a cost-only basis. In 1991, the fees amounted to JD 150-375 per Jordanian trainee and \$US 3,000 per Arab trainee, which included room and board and field trips.

The Centre has a cooperation agreement with the World Bank according to which the Bank provides training materials and trainers and pays the cost of training of non-Jordanians. However, the Bank has not provided trainers lately because the Centre has been able to get them locally, e.g. from Jordanian Universities. On the other hand, the Centre has no linkages with other Arab training institutions.

The Centre formulates its training programmes on its own initiative and also holds special training sessions upon the request of other institutions.

3. Electronic Services and Training Centre: Since its establishment, this Centre has emphasized training. However, since 1981 the Centre expanded its work considerably in the area of electronic equipment maintenance, in line with the priorities of the country. This factor and the limited human resources available at the Centre affected its training capabilities in an adverse manner. Thus, although its 1991 training programme included three elements relevant to industry from a total of eight elements, the Centre was unable to implement any of them. The Centre will not hold any training sessions during 1992, and it remains to be seen whether it will be able to undertake training in the future, in view of the fact that it has been contracted by the Ministry of Health to maintain all electronic medical equipment in Jordan.

IV. INDUSTRIAL TRAINING IN THE SYRIAN ARAB REPUBLIC

The following institutions are concerned with industrial training:

Management Development and Productivity Centre
Scientific Studies and Research Centre

A. Management Development and Productivity Centre (MDPC)

MDPC was established by Government decree No. 73 dated 03/06/1967 as a general establishment with administrative and financial autonomy, reporting to the Minister of Industry. It began operation in 1969. From the beginning, the International Labour Organisation (ILO) extended assistance to MDPC. ILO experts spent time at the Centre during 1969-1971 and later during 1979-1981 and helped in preparing training programmes and in training their Syrian counterparts. The United Nations also provided financial grants to selected Syrian nationals to be trained abroad and in some cases provided training material.

MDPC has two main functions, advisory services and training. Advisory services are offered in many fields, including industrial engineering and production management, general administration, marketing, financial administration, incentive measures, etc.

Each year MDPC prepares an annual plan for its forthcoming activities. Typically, the 1989 plan had seven training programmes as shown below:

(a) Administrative organization programme, aimed at enhancing the knowledge of administrative managers, finance managers, and planning managers with new scientific principles of organization and planning;

(b) Quantitative systems programme utilizing line programming systems for analysing and solving administrative problems. The programme is directed to university graduates in the fields of economics, mathematics, and engineering who are engaged in the administration and implementation of industrial, civil, and services projects;

(c) Personnel management programme focusing on the principles of management and decision-making, job classification, performance evaluation, and recruitment. Different topics are designed for different levels of employees, including top managers;

(d) Incentives programme aimed at improving the abilities of staff members engaged in developing incentive systems;

(e) Industrial engineering and production management programme to acquaint production managers and engineering personnel with modern methods of undertaking work studies, quality control, maintenance, and inventory management;

(f) Marketing programme focusing on the sales function, the distribution function, and inventory management;

(g) Informatics and quantitative methods.

MDPC sends its annual plan to public-sector companies and other interested parties and solicits their responses. In general, the companies nominate candidates for training programmes while the Centre makes the final selection. The companies pay nominal training fees for participating in the sessions sponsored by the Centre. Moreover, through the annual plan, they become aware of the fields in which the Centre can provide advisory services. To carry out its various activities, the Centre keeps a core of permanent staff versed in many fields and utilizes the services of experts from the university and other local institutions on a temporary basis.

According to available statistics, the Centre held 40 training sessions, in which 2,552 trainees participated in 1988 alone; up to the end of 1986, it had organized a total of 374 training sessions in which 10,044 trainees from various sectors had participated.

MDPC has developed operational linkages with Arab and international organizations, including the Arab Organization for Administrative Sciences (in Amman), and the Arab Organization for Industrial Development (in Baghdad) as well as the Islamic Development Bank (in Jeddah) and the ILO. It cooperated with these organizations in formulating and executing joint training programmes; for example, a training session on productivity in industrial establishments was organized jointly by Arab Industrial Development and Mining Organization (AIDMO), MDPC, and the Islamic Bank in 1986. Cooperation sometimes took the form of exchanging instructors with other Arab countries, or training Arab nationals in the Syrian Arab Republic, with United Nations organizations paying the expenses incurred by trainees. Yemeni and Libyan nationals were trained in limited numbers at the Centre, and Moroccans may follow suit according to a protocol concluded recently.

In spite of the general consensus by government officials concerning the importance of its activities, it is evident that MDPC has been facing difficulties which constrain the scope and quality of its work. For example, the duration of the training session has been compressed from a period of 6 to 12 months in the past to less than 1 month at present. In part, this measure was taken to minimize the high living expenses incurred by trainees arriving from remote areas, in view of the fact that neither the Government nor MDPC has facilities to host them. Moreover, the work-force of MDPC has shrunk considerably. It consists now of 11 persons of whom 7 are engaged in administrative work; in the past it consisted of about 45 professionals, in addition to the university professors whose services were utilized occasionally by MDPC. It should be noted, however, that the volume of work at present is much larger than before.

The difficulties at the Centre may be attributed to the unavailability of adequate and reliable funding. Of course the prevailing economic conditions in the country have adversely affected the Centre; moreover, several specific factors contribute to these difficulties.

(a) The rules applied at the Centre pertaining to wages and other compensations are those applied at the Ministries. They do not entice qualified and competent professionals to join the Centre;

(b) The fees which the end-users pay in lieu of services provided by the Centre are not deposited directly in the Centre's account. The same situation exists with respect to any financial assistance the United Nations may provide. Thus it is up to the Ministry of Planning to decide which institutions in the country, including MDPC, will benefit from such funds. In practice, MDPC prepares a budget proposal, and the Ministry of Finance makes the final decisions pertaining to it;

(c) The Centre has no linkages with the private sector, and it is not permitted to accept fees from the private sector for any work it may perform.

The staff of MDPC suggested the following actions to strengthen its performance:

(a) Administrative and financial incentives for the staff should be introduced;

(b) United Nations assistance is needed for sending to the Centre experts who are capable of training local instructors. When selecting experts, emphasis should be placed more on their ability to train others than on their knowledge of the subject matter. United Nations experts can also assist in selecting the most qualified Syrian counterparts to absorb the training material;

(c) Incentives for the Syrian counterparts should be introduced to attract the largest possible number of candidates, noting that there are many capable persons working at the universities and government agencies;

(d) United Nations assistance is needed for organizing training sessions on scientific research methodology, including references, attribution, documentation, etc.;

(e) More moral support by the Government is needed. For example, the staff of MDPC consider the High Institute for Administrative Development which was created at the University of Damascus to be a duplication of MDPC and an indication of the Government's weakening support for MDPC's existence;

(f) Financial organization programmes aimed at providing finance and accounting managers with necessary expertise to apply standard techniques of costing, budgeting, purchasing, management, etc., should be introduced.

B. Scientific Studies and Research Centre (SSRC)

SSRC was established in Damascus in 1969. The scope of its objectives and activities was extended in 1972 and 1983 to include research, experimental development, scientific training and industrialization. The Centre has the status of an independent scientific centre and is managed by a board of directors composed of the Centre's chairman, directors of affiliated institutes, and academic figures.

SSRC maintains strong scientific cooperation with national and foreign scientific institutions, e.g. University of Damascus, University of Aleppo and many European universities, and with regional and Arab scientific organizations such as the Kuwait Institute for Scientific Research (KISR) and the Arab School for Science and Technology (ASSAT). It also cooperates with international organizations including ESCWA, ILO, the United Nations Educational, Scientific and Cultural Organization (UNESCO), UNDP, UNIDO, the United Nations Centre for Science and Technology (CSTD), and the Islamic Foundation for Science, Technology, and Development (IFSTAD).

The Centre's activities cover applied science and technology, management, economics, and promotion of selected industries, especially electronics. One of its affiliated institutes, the High Institute for Applied Science and Technology, which was established in 1983, carries out research in electronics, physics, chemistry, biology and environment, mechanics, aeronautics, informatics, management and economics. It also carries out a special training programme through which selected high school graduates receive training in engineering for a period of five years by the end of which they are capable of doing applied research.

In the area of industrialization, SSRC aims at linking R and D with industry, transferring new technologies and their applications into the country, and assisting the public sector in conducting studies for industrial projects. In the area of management and economics, SSRC aims at training high- and mid-level managers in a variety of areas including production units, and also at preparing economic feasibility studies for projects. SSRC provides support and technical services, including calibration, maintenance and repair, quality control, documentation and scientific information.

Until the present time, SSRC has not undertaken industrial training as a continuous and planned activity. It does not have a special centre for training, and whatever training sessions it holds are of an ad hoc nature rather than elements of a formal annual plan. In spite of the above, the officials at the Centre emphasized deep concern for industrial training. They identified a number of projects linked to SSRC which would entail industrial training in the near future, namely:

(a) Technology of optics. At present the staff of SSRC are being trained on this technology. This training can be extended to Syrian industry later on;

(b) Steel foundry, and computer maintenance management system. These two projects, which are supported by UNIDO, will have their own training centres;

(c) Industrial automation. A training centre for industrial automation will be established to serve Syrian industry;

(d) National standards and calibration laboratory. This project, which was established with Japanese support, is nearing completion. It is conceived that training will be carried out in this field both at the national and the regional levels;

(e) CAD/CAM training centre. Establishment of such a centre in the Syrian Arab Republic is under consideration. It would be modelled after the Czechoslovak centre which was established with the help of UNIDO to attract trainees from developing countries;

(f) Industrial production, management, etc. SSRC cooperates with the Arab School for Science and Technology in organizing seminars on these topics for Syrian and Arab professionals. Perhaps training programmes may evolve from these activities.

It should be mentioned that SSRC is trying to strengthen its coordination with industry. For that purpose the centre for technology development (CTD) will be established, with the help of UNIDO and UNDP, to become the formal linkage between SSRC and industry.

V. PROBLEMS AND ISSUES IN INDUSTRIAL TRAINING

Six major issues have been identified and discussed in this study. They are:

- The financing of training activities
- Training top managers
- Training engineers and specialists
- Linkages between training centres and industry
- Regional cooperation among training institutions
- Cooperation between training institutions and regional organizations

A. The financing of training activities

Shortage of funds was cited frequently by many training officials as a factor constraining the performance of their institutions. Insufficient funds prevent acquisition of better training equipment and material, recruitment of better instructors, formulation of better programmes, undertaking training at foreign institutions, etc.

It became clear, in the course of the field-work conducted for this study, that this problem exists in most training institutions in Egypt, Jordan and the Syrian Arab Republic, whether these institutions are engaged in management and administrative training, or in specialized technical training, etc.

In order to tackle this problem, training institutions should not depend entirely on governmental contributions. They have to generate their own income, and therefore should adopt the principle of "paid" training. This principle may be applied in different ways under different circumstances (e.g. in relation to public-sector or private-sector companies); the end result should be the same, however, namely that industrial enterprises should bear the cost of the training which their personnel receive. It should be mentioned that certain institutions in the three countries which were visited receive training fees; however, even in these cases it seems the amounts charged were below the actual cost of training provided by the training institutions. Moreover, the income generated from training should be deposited into the accounts of the respective institutions, which should be free to use it in training activities as they see fit. It was mentioned in chapter III of this report that certain institutions do not have this authority.

Another source of funds could be the various regional and international organizations and institutions (e.g. UNDP, Islamic Development Bank), who may either provide direct financial or in kind assistance. Training institutions ought to learn the proper way of exploring these possibilities, and regional organizations such as ESCWA can help in this respect.

B. Training top managers

Until recently, the training of top managers of industrial enterprises to upgrade their skills has been very limited. In the beginning, training in Egypt, Jordan and the Syrian Arab Republic aimed at developing semi-skilled

and skilled workers and technicians. Later on, training was extended to cover engineers and administrators as well as middle managers. On the other hand, top managers, the executives who make the key decisions, did not participate in training activity.

Realizing the importance of upgrading the skills of top managers and bringing them up to date through specialized training programmes, the Government of Egypt established the Managers Development Centre for Industry (MDCI), which began operating in February 1990. No such specialized institutions have been established in Jordan or the Syrian Arab Republic, where this activity is undertaken by the Jordan Institute of Management and the Management Development and Productivity Centre, respectively, but with limited success.

It is suggested here to introduce a new training programme aimed exclusively at top industrial executives in Jordan and the Syrian Arab Republic. At least in the near future there will be no need to establish new centres for that purpose; the Jordan Institute of Management and the Management Development and Productivity Centre in the Syrian Arab Republic may be entrusted to carry out this activity. The following important considerations should be taken into account:

(a) The training programme should be tailored exclusively for top managers, i.e., there ought to be no participation by lower-level managers, since this could weaken the participation of top executives;

(b) The training sessions should be short and intensive so as not to jeopardize the normal work of top executives. Training sessions could deal with different topics in a periodic fashion;

(c) The training programmes must be formulated by specialists who have worked as top executives or who have prepared successful programmes previously. The same conditions apply to instructors;

(d) The training programme should strike a balance between theory and practice, e.g. new developments in the field of management vis-a-vis analysis of relevant case-studies;

(e) The Jordan Institute of Management and the Management Development and Productivity Centre in the Syrian Arab Republic should benefit from the Egyptian experience in formulating their specialized training programme and in sending some of the top executives in Jordanian and Syrian industry to MDCI for training.

C. Training engineers and specialists

Many institutions in Egypt carry out this type of training, i.e., the National Research Centre, El-Tabbin Institute for Metallurgical Studies, and the Industrial Design Development Centre (IDDC). However, IDDC has been most effective of all because it maintains strong linkages with the industrial sector, public and private, not only in the context of the training function but also by means of other services which it provides to the industrial enterprises, as mentioned in chapter II of this report.

In Jordan, this type of training is carried out only by the Royal Scientific Society. However, its effectiveness has been limited because the training function has not been provided with the necessary financial and administrative support; this has been amply illustrated by the absence of a central bureau for training at RSS and the cancellation of scheduled training sessions due to lack of resources. In order to improve this type of training in Jordan, it is proposed to adopt the concept of IDDC at RSS and to establish strong linkages with that centre. In the case of the Syrian Arab Republic, the concept of IDDC could be applied at the Scientific Studies and Research Centre after establishment of the centre for technology development at SSRC, which will link it to the industrial sector. In the meanwhile, arrangements ought to be made to train Syrian engineers and specialists at IDDC in Egypt.

D. Linkages between training centres and industry

One statement was voiced time and again in Egypt, Jordan, and the Syrian Arab Republic, not only by people in industry but also by people from within training institutions, to the effect that training programmes were not adequately satisfying the needs of the industrial sector; training programmes were academic in nature, not oriented towards practical applications. More specifically, it was thought that coordination between the many training institutions and the industrial enterprises they served was not sufficient, and consequently the training programmes of these institutions reflected the wishes and capabilities of the training institutions and not the needs of the industrial sector.

Several proposals for strengthening linkages between training institutions and industrial enterprises are presented below:

(a) The linkages in question must be institutionalized: representatives of the industrial sector, public and private, should serve on the boards of the training institutions. They should participate in formulating training policies and in monitoring the proper application of these policies;

(b) Instructors must have had practical industrial experience;

(c) After each training session, the responses of the trainees and their enterprises concerning its effectiveness must be formally solicited, analysed, and taken into account when preparing succeeding sessions.

E. Regional cooperation among training institutions

It became clear during field missions in Jordan, Egypt, and the Syrian Arab Republic that limited contacts have been made among training institutions in these countries. Simultaneously, it was clear that these institutions could benefit substantially from the experiences and capabilities of each other. Some possible modalities of cooperation are suggested, as follows:

(a) Instructor training: instructors from one institution or country may be trained at another institution where the level of instruction is superior. Also, a programme for exchanging instructors could be developed;

(b) On-the-job training at the facilities of industrial enterprises in one country may be carried out for trainees from another country;

(c) Top Jordanian and Syrian industrial executives could participate in the training programme for top executives and managers at the Managers Development Centre for Industry (MDCI) in Egypt. Similarly, engineers from Jordan and the Syrian Arab Republic may enrol in the training programmes of the Industrial Design Development Centre (IDDC) in Egypt. The above-mentioned interim arrangements could continue until Jordan and the Syrian Arab Republic develop their own capabilities;

(d) It would be useful for managers and directors of training institutions in the ESCWA region to exchange visits periodically to study each other's experience and exchange new methods and techniques.

F. Cooperation between training institutions and regional organizations

Training institutions in Jordan, Egypt, and the Syrian Arab Republic have a history of cooperation with international organizations, mainly ILO and UNIDO, and with foreign institutions in Europe, Asia and the United States. Cooperation has taken many forms, including sending foreign experts to train nationals, providing training equipment and aids, and granting scholarships to train nationals abroad.

It is suggested here that ESCWA and AIDMO, the two leading organizations concerned with industrial development in the ESCWA region, should take the initiative to forge linkages with training institutions. Specifically, they can do the following:

(a) Organize training sessions in which their staff, or commissioned outside experts, provide training on such topics as preparation of feasibility studies; planning, establishing, and managing the industrial enterprise; negotiating technology transfer contracts; computer-aided design and manufacturing (CAD/CAM); preventive maintenance, etc.;

(b) Act as catalysts to obtain financial aid for training institutions from financing organizations, such as the Islamic Development Bank and UNDP;

(c) Promote cooperation between training institutions in the region and similar institutions in certain developing countries such as India, Korea and Brazil. Because of similarities in the backgrounds and experiences of developing countries, the suggested South-South cooperation may be more realistic and fruitful than North-South cooperation.

In addition to the above-mentioned problems and issues that obstruct the development of industrial training in ESCWA member States, three other obstacles are emphasized here due to their particular relevance:

(a) There are no national or subregional policies or legislation specifically geared to the development of industrial training institutions and incorporated into national development plans. Consequently, there is no integrated industrial training programme;

(b) The subregion Egypt, the Syrian Arab Republic, and Jordan, just like the rest of Western Asian countries, suffers, from poor management in the industrial sector and the lack of will to utilize competent professionals capable of carrying out satisfactory technical evaluations, designing or selecting appropriate methods, analysing production processes, overcoming technical and management problems and planning and deciding on the policies and strategies to be followed;

(c) There is no genuine regional industrial cooperation aimed at self-reliant and self-sustained development through the pooling of manpower, technical and financial resources.

G. Proposals

In the area of industrial training, in addition to the efforts of member countries, ESCWA, AIDMO and UNIDO could cooperate to provide assistance to the countries of the region in the following activities that need to be developed on the national and regional level.^{2/}

(a) A continuous review of training needs, programmes and facilities;

(b) Developing comprehensive and fully integrated programmes directed towards the training of technological capabilities and industrial trainers;

(c) Strengthening multi-purpose training institutions and specialized institutions to provide training in specific core industrial subsectors and branches;

(d) Strengthening training links between universities, training centres and industry;

(e) Introducing special training programmes for industrial maintenance and rehabilitation and the integration of women in industrialization;

(f) Mobilizing financial resources for industrial training.

^{2/} UNIDO, "Subregional co-operation in the fields of industrial training, consultancy and entrepreneurships" (ID/WG. 472, 1988 & ID/WG. 495, 1990).

Annex I

VOCATIONAL TRAINING IN EGYPT

Vocational training is carried out by the Productivity and Vocational Training Department (PVTD). It consists of three types of training, namely apprenticeship, accelerated training, and upgrading.

The apprenticeship system is a long-term training programme in which trainees spend their first year at the training centre where they learn the basic skills of their trades, both theoretically and practically, spending three days per week on each type. Thereafter they spend two years at the facilities of production companies to continue with practical training in their specializations. During these two years, they return to the training centres to receive theoretical training two days a week in the first year and one day a week in the second year. Trainees are supervised by PVTD personnel during these two years and are regarded as workers being trained according to a written contract. They receive nominal compensation from the production companies to which they are attached -- less than one Egyptian pound per month from public-sector companies, and five Egyptian pounds from private-sector companies. Upon completing the three-year programme, trainees receive apprenticeship diplomas and are designated as skilled workers. In order to enrol in the apprenticeship programme, an applicant must have completed the general preparatory education, passed a personality and aptitude test and be 15 to 19 years of age. PVTD decides which trade each trainee must learn. However, sometimes it allows trainees to make their own choice when this does not contradict the Department's goals in terms of the number of trainees it wants to prepare in each trade. The average number of trainees graduating from the apprenticeship programme is about 13,000 per annum; more than 27,000 have completed this programme in 82 trades to date.

The apprenticeship system offers many advantages to trainees and industrial enterprises alike, namely:

(a) Trainees are exposed to social sciences and cultural studies. The practical training they receive in the factories familiarizes them with the work environment they can expect to encounter. While enrolled in this programme they receive some financial compensation and social security benefits; they are also exempted from military service until after graduation. The apprenticeship diploma which they receive on graduation is officially equivalent to the General Certificate of Industrial Education in terms of job classification and salary;

(b) Industrial enterprises participate with PVTD in preparing the contents of the training programme and specifying the level of skills required in each trade. Moreover, they cooperate with the Government in bearing the cost of training.

The accelerated training system is a short-term training programme, lasting from four to nine months. It aims at quickly providing industrial enterprises and production units with medium-skilled workers. Thus it

transforms semi-skilled workers into skilled workers. Upon completion of this programme, the trainees receive certificates indicating the level of their skills. Candidates for this programme must be able to read and write, know the basics of mathematics, and be between 15 and 45 years old. On the other hand they receive some daily compensation during the training period. On the average, about 3,000 trainees complete this programme every year, and about 6,000 have completed it so far.

The upgrading system is a short-term training programme, ranging from three to five months depending on the specialization. It aims at upgrading the skills of workers of industrial enterprises and production units, and acquainting them with modern technologies in their specialization. At the end of the programme, the trainees receive certificates which indicate their skill levels. The average number of trainees benefiting from this programme is about 1,000 per year, the total number of trainees who have completed this programme up to now exceeds 2,000.

In addition to apprenticeship, accelerated and upgrading training programmes, a new type of programme has been introduced at vocational training centres. It aims at training unskilled workers to acquire skills needed by industry. Training is carried out in one trade for a period of four to six months after which another trade becomes the subject of training and so on.

The specializations in which training is offered at the vocational training centres include the following:

- (a) Metals: milling, welding, heat treatment, etc.;
- (b) Electricity: general electricity, electrical equipment, etc.;
- (c) Precision equipment: radio and television, electronic equipment;
- (d) Mining: excavation, loading, crane operating, etc.;
- (e) Textiles: weaving, dyes, etc.;
- (f) Air conditioning, including ventilation;
- (g) Automotive: car electricity, car mechanics, etc.;
- (h) Maintenance relating to electrical, mechanical and textiles equipment;
- (i) Printing, photography, letter setting, etc.

PVTD also offers tailor-made training programmes commensurate with the needs of specific recipients; productivity enhancement college graduates working at industrial enterprises and projects, for example, can participate in these programmes.

PVTD undertakes another important type of training, namely instructor training. In 1959 the Government signed an agreement with the International

Labour Organisation (ILO) to establish an instructor training institute in Cairo. The United Nations contributed experts, fellowships, and some equipment, while the Government contributed land, buildings, equipment, and personnel. The Institute began operating in the new facilities in 1964.

The Institute trains instructors and directors of governmental and private training centres. Large numbers of these instructors work in vocational training centres, and many of them supervise apprentices during the practical training phase at the facilities of industrial enterprises.

The Institute has a capacity of 1,000 trainees, and some of its students come from Arab and African countries. Specializations at the Institute include the following:

(a) Metal trades: fitting, too- and die-making turning-machining, welding, etc.;

(b) Automotive trades: auto mechanical, auto electrical and auto machinists;

(c) Electrical engineering trades: general electrician, and motor repair electrician;

(d) Electronics: radio and TV maintenance, repair and maintenance of precision electronic equipment;

(e) Other specializations, such as spinning and weaving, leather tanning and printing, are treated theoretically at the Institute, while practical training is carried out at the vocational training centres or in the factories. The Institute also organizes special courses upon the request of industrial enterprises.

The instructor training programme is geared to developing instructors with solid practical skills and good theoretical knowledge in their trades and with the ability to supervise, guide, teach, motivate and understand young people. It has two components: a basic course and an advanced course.

The basic course provides instructors with fundamental knowledge in the metal, automotive, and electronic trades and in effective instructing methods. It covers 46 weeks, 36 hours per week. Requirements for admission to this course include successful completion of secondary trade school or three years of apprenticeship training or the equivalent, and five years' experience in the trade, as well as passing an entrance examination and successfully completing a probationary period of ten weeks. On the average, 150 instructors enrol annually in this course.

The advanced course aims at upgrading instructors' skills in advanced trade techniques and instructing methods. It covers 12 weeks, 36 hours per week. Trainees who have successfully completed the basic course for instructors and have had a minimum of two years' experience as instructors at governmental or private training centres can participate in this course. About 100 instructors enrol in it annually.

The Institute also offers a special course for training directors and managers of vocational training centres. The course aims at providing trainees with up-to-date information on supervision and maintenance techniques. It covers 3 weeks, 36 hours per week. In order to be admitted to this course, candidates must be working as managers at training centres or in industry and must have had two years' experience as staff members of training centres.

The Institute also offers courses for workers of industrial companies, as follows:

Production inspectors	10	weeks
Drawing instructors	25	weeks
Electrical foremen	10	weeks
Storekeepers	6	weeks
Electrical maintenance operators	6	weeks
New engineers	20	weeks
Metal foremen	10	weeks
Automotive foremen	10	weeks

So far, the Institute has graduated about 7,000 training managers, instructors, or technicians to satisfy the needs of vocational training centres and industrial enterprises. The Institute has a permanent teaching staff of 50 professionals (engineers, researchers, instructors and social workers), and 30 or more specialists from higher institutes and universities who teach at the Institute as the need arises.

The training philosophy of PVTD is to satisfy the needs of Egyptian industry and to attract potential recipients of its programmes from Arab, African and Asian countries. In fact more than 150 trainees from these countries participate in PVTD's vocational training programmes each year, and more than 1,300 of them completed the apprenticeship and instructor training programmes during the period 1974-1986. Also, more than 650 technicians, instructors, and specialists from PVTD participate in training and in industrial and economic activities in Arab and African countries and in international organizations. PVTD also extends its services to more than 250 industrial enterprises and economic units in the form of management consultations, productivity control, and vocational training. The average number of trainees per year who benefit from PVTD in all types of training exceeds 30,000, in more than 74 specializations, at 51 centres affiliated with it; more than 100,000 trainees have completed the programmes of PVTD so far.

In order to strengthen its training programmes, PVTD established a language laboratory and sends instructors and engineers to the American University in Cairo to receive instruction. It also established a media centre to design and produce educational aids.

PVTD maintains work relations with ILO and the British Council. It has received grants from EEC, USAID and the German and Italian Governments and has received soft and commercial loans from the Development African Bank and the World Bank. It has also received fellowships from the United Kingdom, Italy,

Japan, United States, Germany and ILO. For example, ILO is executing a project to further develop the existing instructor training institute, while other parties extend loans to finance the project. Moreover, some of these organizations arrange training missions to foreign countries to train engineers and instructors, with the host countries bearing the cost of training in the form of grants.

PVTD is responsible for specifying the type, level, contents, duration, and requirements of training programmes, and for planning and implementing them. It is also responsible for determining the numbers, qualifications, and selection criteria of trainees as well as the numbers and qualifications of instructors. And in order to ensure accurate understanding by PVTD of the needs of industry, PVTD relies on its contacts with capable professionals working in industrial enterprises. It also relies on its formal linkages with such enterprises through eight regional consultation councils in eight training districts. The councils formulate policies and provide guidance to PVTD, but they have no executive powers. Each council is chaired by one elected president of one of the industrial companies operating in the district concerned. The PVTD district manager is the rapporteur of the council, and the presidents of companies in that district are the members of the council. The eight consultation councils are in turn linked to a High Consultation Council whose chairman is the Minister of Industry. Its vice chairman is the President of PVTD, while the Chairman of the eight regional councils are members of the High Consultation Council.

The officials of PVTD suggested a number of measures to improve the performance of the Department, as shown below:

(a) Upgrading and strengthening instructor training can be accomplished by sending more instructors to be trained abroad, and by getting better equipment for the Instructor Training Centre. It should be mentioned in this context that PVTD does not face any difficulty in attracting candidates for instructor training because of its incentives, which include monetary incentives, training abroad, and accelerated promotions;

(b) Maximizing employment opportunities for PVTD graduates could be accomplished by strengthening the small-scale industrial sector, and by exploring the labour markets of Arab and African States. It should be mentioned that although trainees receive very little monetary compensation, PVTD has not experienced any difficulties in finding large numbers of young people willing to enrol in its programmes;

(c) PVTD uses its funds to buy training aids and equipment, and whenever it encounters financial difficulties, it seeks funds from the Ministry of Industry and sometimes from the consultation councils. Invariably, it gets little money, if any at all;

(d) There is no coordination between PVTD and secondary industrial schools. The graduates of these schools find jobs with the industrial enterprises directly. PVTD believes that it should participate in preparing the curricula of such schools and in the employment process of their graduates;

(e) There are no cooperation agreements between Egypt and other Arab countries in the field of training this should be changed;

(f) There is an urgent need to introduce mobile training in remote areas. PVTD cannot provide necessary accommodations for out-of-town trainees;

(g) After graduation, all trainees can join public-sector or private-sector companies or even work in foreign countries. There is no law preventing them from doing so. PVTD would like the Ministry of Industry to pass a law forbidding PVTD graduates from working in any company without its permission.

Annex II

VOCATIONAL TRAINING IN JORDAN

The Vocational Training Corporation (VTC) was established by temporary decree No. 35 dated 26/5/1976 and became operational in the second half of 1977. Its establishment reflected the energetic economic development in Jordan during the 1970s, and the need for skilled manpower to work in development projects. In fact, the 1976-1980 national plan regarded the establishment of VTC as one of the main development projects in the country.

VTC is engaged in two related aspects of vocational education, namely vocational training and vocational certification. Vocational training aims at developing semi-skilled and skilled workers, upgrading the skills of workers to improve their productivity, training instructors and industrial foremen, and offering training in the area of industrial safety and professional hygiene. Vocational certification, on the other hand, aims at developing and enacting a universal system for the various levels of skills and the corresponding salary scale. It also aims at establishing a system for assessing performance, evaluating skill levels, and issuing certificates which would serve as the basis for granting trade licences. VTC tries to coordinate its activities with all other parties engaged in training activities and vocational education in the country.

Vocational training consists of the following types, each of which is described briefly:

1. Corporation or dual training is actually apprenticeship training. It is based on an agreement or partnership between the industrial enterprise and VTC for manpower development. From a legal point of view, the labour law governing apprenticeship training considers trainees as workers undergoing training and requires a contract to be concluded between the industrial enterprise and the trainee. Trainees first join a vocational training centre to acquire basic skills for a period ranging from two to six months, depending on the specialization or trade. Then they join industrial enterprises to receive practical training at their facilities in accordance with a prescribed programme under the direct supervision of VTC personnel and the staff of the industrial enterprises. For 23 months the trainees spend three days a week at the enterprises and another three days a week at the vocational training centres, where they receive theoretical vocational education. In some cases, provided the trainees have finished compulsory military service, the programme may include a third year which the trainees spend at the industrial enterprises. This additional period acquaints the trainees with the work environment and requirements and provides the industrial enterprises with the opportunity to evaluate the performance of the trainees in order to select from amongst them after they graduate.

The conditions of admission to corporation training are listed below:

- (a) Candidates must have successfully completed the compulsory education stage, i.e., ten years of schooling;

(b) They must be between 16 and 19 years of age or under 22 years of age in case they have completed the compulsory military service or have been exempted from it. As mentioned before, compulsory military service is postponed for trainees until they complete the two-year apprenticeship programme; VTC handles all administrative matters relating to this subject;

(c) Candidates must be able physically and mentally to satisfy the requirements and needs of their trades;

(d) They must successfully pass interviews conducted by officials of VTC and the industrial enterprises;

(e) They must pay training fees at the rate of 18 dinars in the first year and 20 dinars in the second year. It should be mentioned in this context that VTC tries to allow training candidates to choose their trades, provided that this is not out of line with the results of the admission interviews or the candidates' school grades.

The industrial enterprises to which apprenticeship trainees are attached may voluntarily provide them with financial compensation, or with free transportation to and from the respective facilities. After they graduate, the trainees may choose to sit for the General Certificate of Industrial Education Examination in their particular specializations, and if they succeed, they can apply for admission to colleges and universities.

Apprenticeship training is offered in many trades or specializations, namely:

(a) Electrical: transformer stations, electrical installations, electrical maintenance, repair of home appliances, automotive electrical systems, and TV and radio;

(b) Mechanical (automotive), repair of light cars (benzine), buses and trucks (diesel) and railroad wagons;

(c) Mechanical (production): welding and metal forming, general machining, mechanical maintenance, etc.;

(d) Mechanical: central heating, air conditioning;

(e) Woodwork: carpentry, decoration;

(f) Construction: tiling, etc.

Apprenticeship training was introduced in 1977 upon the establishment of VTC. In 1989, the number of trainees enrolled in this programme was 1,990, of whom not more than 20 trainees pursued non-technical trades. In the same year, the number of trainees who completed the apprenticeship programme was 2,316, bringing to 11,329 the number of trainees who completed it since it was first offered.

2. Middle training was introduced at VTC in 1985. Trainees first spend two months at training centres to acquire basic skills in their trades. Then, as in apprenticeship training, trainees spend three days a week at the training centres and another three days a week at the facilities of industrial enterprises for a period of nine or ten months. Occasionally, whenever it is not possible to make the necessary arrangements with industrial enterprises, trainees spend all six days a week at the training centres. To be admitted to this programme, candidates must have completed seven years of schooling and must be 14 to 18 years of age. Upon graduation trainees are considered assistant technicians. About 440 trainees enrolled in this programme in technical specializations in 1989. In 1988, 2,300 enterprises cooperated with VTC in the medium and apprenticeship training programmes, and in 1989 this number increased to 2,257 (of these, fewer than 35 enterprises were engaged in non-technical trades).

3. Crash training was introduced by VTC in 1980 with the aim of upgrading the skills of factory workers, including those wishing to learn new trades. The training session consists of 150 to 160 hours, depending on the trade. The number of trainees who enrolled in this programme in technical trades during 1989 was about 450. Moreover, VTC introduced another crash training programme in 1987 with the objective of providing the unemployed with skills to enhance their chances of finding jobs. Training sessions last three to four months. Candidates wishing to enrol in this programme must be able to read and write and must be 15 to 50 years old. However, because of prevailing high unemployment, university graduates and graduates of junior colleges enrol in this programme. In fact the latter group amounts to almost 67 per cent of total enrolment.

There are three types of upgrading training:

4. Safety training: VTC introduced safety training in 1984. Participants are either current employees of industrial enterprises or potential employees. They are nominated by the industrial enterprises, and participate in a six-week session comprising about 30 training hours. In 1989, 417 trainees from technical and non-technical categories joined this programme, and in 1990 about 50 engineers participated in it;

5. Instructor and foreman training: Every instructor when first employed by VTC is obliged to participate in a two- to three-week training session, and must later participate in one or two seminars every year.

VTC also organizes training sessions for foremen working in large industrial enterprises. In 1989, 653 trainees joined this programme; some of the instructor trainees were from the Gulf States;

6. Worker training: In 1989, VTC held 32 sessions for upgrading the skills of workers at its centres. About 330 trainees in 13 specializations participated in these sessions. Each session consisted of 150 to 160 hours of training.

In addition to the types of training mentioned above, VTC is making preparations to introduce so-called industrial extension training to assist

small-scale and medium-scale industrial enterprises. Industrial extension contains three components:

- (a) Providing technical advisory services to industrial enterprises;
- (b) Training the workers of those enterprises;
- (c) Providing the enterprises with counselling related to vocational safety.

VTC has already sent some of its staff abroad to receive the necessary training which will enable them to become instructors upon their return. It will also contact international organizations including UNDP and ILO to solicit their assistance.

VTC is also thinking of introducing vocational guidance (counselling) at some time in the future, with the objective of persuading and encouraging young people to enrol in vocational training.

A review of available statistics indicates that the number of trainees participating in all types of training (apprenticeship, middle and crash) at VTC centres increased steadily from 2,243 trainees in 1980 to 11,501 in 1988 and then decreased to 10,798 in 1989, reportedly because of a drop in apprenticeship training. Statistics also show a relative increase in crash training since 1985, which correlates with the rise of unemployment in the country during this period. And although available statistics do not show the percentage of female trainees, it is evident that their ratio is high in certain trades such as sewing, weaving, etc.

The Vocational Training Corporation has 14 training centres including a vocational safety centre and an instructor and foreman centre. It is contemplating adding two more centres.

VTC is managed by a board of directors. The Chairman is the Minister of Labour, and the Vice-Chairman is the Director General of VTC. Other members of the Board include representatives of other ministries, the private sector, and professional societies or federations. Its budget consists of government contributions, training fees, payments paid to VTC for its services, and fees it charges for organizing vocational work.

VTC has a technical department responsible for preparing training programmes. In addition to the staff of VTC, experts from industrial enterprises participate in this task as paid consultancy in view of their intimate knowledge of the specializations and skill levels needed by the industrial sector. The number of trainees admitted for each specialization is based on feedback received from the industrial enterprises.

VTC cooperated with the People's Democratic Republic of Yemen in a project to organize a training institute in that country and trained some of its nationals, at the expense of the United Nations. It also trained some of the staff of the Tobacco Company in the Yemen Arab Republic and the company paid the training fees. VTC sometimes utilizes the services of foreign experts at its centres and has been able to obtain equipment donated by the World Bank and other institutions.

The officials of VTC made a number of remarks concerning vocational training in the country, as shown below:

(a) Some of the equipment at the training centres is almost obsolete and needs to be replaced. Other items are manual and should give way to modern numerically controlled (NC) machines. Moreover, some necessary items of equipment are not available at certain centres, e.g. heat ovens, "sun" equipment, etc.;

(b) Some industrial enterprises do not wish new trainees to be trained at their facilities under the apprenticeship or medium training programmes and prefer to employ non-nationals who accept low wages and difficult working conditions. It is therefore necessary to establish suitable workshops at the training centres, where trainees may acquire the same skills that they would at the facilities of these industrial enterprises;

(c) Some of the centres located in rural areas find it difficult to attract candidates to their programmes. This is a problem related to social values in those areas and requires a new approach to overcome the resistance of such societies to vocational work;

(d) Training centres find it difficult to provide transportation for instructors to the industrial enterprises to evaluate the progress of trainees under the apprenticeship and middle training programmes;

(e) It is necessary to strengthen cooperation between VTC and vocational education affiliated with the Ministry of Education. VTC could benefit from the use of the well-equipped facilities of vocational schools, and the schools, through VTC, could become familiar with the work environment in industrial enterprises. Perhaps both activities could be placed under one umbrella, i.e. in the same department or under the same governing body. It should be mentioned that in vocational education, which includes industrial secondary education, students spend half of their time in theoretical training and the other half in school workshops. After they graduate, not more than 2 per cent of them enrol in universities, and about 20 per cent enrol in polytechnics (two years beyond secondary education). The rest, about 78 per cent, seek employment. About 9,000 students graduate each year; about 3,000 of these complete industrial secondary education;

(f) It is necessary to introduce a new certification and testing law to organize vocational work. VTC should test all workers, including non-Jordanians, to place them in different classifications whereby their salaries and grades would correlate with their skill levels;

(g) In order to ease the financial difficulties of VTC, it is suggested that industrial enterprises contribute the equivalent of 1 per cent of their workers' wages to VTC;

(h) Mutual trust and satisfaction must be attained between trainees and industrial enterprises. Trainees complain that they are not given adequate responsibilities whereas the enterprises complain that the trainees are not capable of holding such responsibilities. In addition, there is a high turnover rate among VTC graduates seeking better jobs;

(i) Training in certain specializations is not offered by VTC, e.g. mould-making, which is essential to local industry;

(j) It would be beneficial to the staff of VTC to exchange visits with their counterparts in Arab and neighbouring countries to learn about new developments;

(k) After they graduate, the trainees are not legally obliged to work at the industrial enterprises in which they were trained. Similarly, the industrial enterprises are not committed to employ any of the trainees;

(l) College graduates are trained by VTC only in the field of vocational safety. VTC is not involved in advanced technical training, e.g. computer-aided design and manufacturing (CAD/CAM), and wishes to have a role in this activity which is currently pursued by the university.

Annex III

VOCATIONAL TRAINING IN THE SYRIAN ARAB REPUBLIC

The Vocational and Technical Training Directorate (VTTD), which is affiliated with the Ministry of Industry, encompasses middle institutes and vocational training complexes.

1. Middle institutes

The first middle institute, for textiles industries, was established in Damascus in 1970. Another five institutes were established in 1975, and in 1987 the Minister of Education decided to establish three more institutes, bringing to nine the number of institutes affiliated with the Ministry of Industry. These are shown below, in chronological order of their establishment.

<u>Name of institute</u>	<u>Location</u>	<u>Specialization</u>	<u>Trainee absorption capacity</u>	
			<u>First year</u>	<u>Second year</u>
Textiles industries	Damascus	Spinning, weaving, chemistry	405	314
Applied industries	Damascus	Electricity, electronics, machine production mechanics	218	592
Food industries	Damascus	Grains and derivatives	168	194
Chemical industries	Damascus	General chemistry	117	202
Applied industries	Homs	Electricity, electronics, general chemistry, etc.	355	206
Agricultural mechanization	Aleppo	Electricity, electronics, production of agricultural machines	320	439
Applied industries	Aleppo	Electricity, electronics, machine production	149	200
Textiles industries	Aleppo	Spinning, weaving, chemistry	261	78
Food industries	Homs	Grains and derivatives	<u>203</u>	<u>160</u>
Total			2 196	2 385

As mentioned before, these institutes are affiliated with the Vocational and Technical Training Directorate in the Ministry of Industry. However, together with all other middle institutes in the country, they are governed by the policies and strategies of the High Council for Middle Institutes which is headed by the Deputy Minister of Higher Education for Institutes Affairs.

Candidates for training at these institutes should have obtained the General Education Examination Certificate, and must have been selected for institute education (rather than university education) on the basis of established criteria (examination scores, etc.) and set policies. For example, the latest government policy states that in 1995 the percentage of students in universities and middle institutes will become 40 per cent and 60 per cent respectively, which indicates a shift towards institute education, in line with the needs of the country. The duration of institute education is two years, and the maximum allowable time any student can spend at an institute is four years.

During their training at the institutes, the students receive 150 Syrian pounds (LS) per month. After graduation they are legally committed to work in the public sector for a period of time equivalent to three times the period they spent at the institutes, i.e., 6 to 12 years. However, this law does not apply to students enrolled at the applied industries institute in Aleppo, the textiles industries institute in Aleppo, or the food industries institute in Homs. Students of these institutes neither receive any compensation during training nor are obliged to work in the public sector after graduation.

In addition to the shift in favour of middle institute education, the policies of the Government have been encouraging more participation by women. Thus, the percentage of women trainees at present ranges from 35-40 per cent, compared to 10-15 per cent in the past. Similarly, the percentage of women instructors stands at 25-30 per cent at present, whereas not more than two women held such jobs in the past. Women's participation is much higher in certain specializations such as textiles and food industries.

The 1988/1989 instruction plan for industrial electronics is given below, as a sample:

1. First year

(a) Theoretical courses	<u>Number of hours per week</u>	
	Theory	Practice
- National culture	2	-
- Arabic	2	-
- Foreign language	2	-
- Applied mathematics	2	-

(b) Technical courses

- Industrial safety	2	-
- Electrical engineering fundamentals	2	2
- Industrial drawing and electronic drawing	-	2
- Technology of electronic material	2	-

(c) Specialized applied courses

- Fundamentals of electronics	2	2
- Electronic circuits I	2	2
- Workshops and maintenance	-	6
- Electronics laboratory	-	4

Total	18	18
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2. Second year

(a) Theoretical courses

- National culture	2	-
- Arabic	2	-
- Foreign language	2	-
- Environmental protection	2	-

(b) Technical courses

- Computers	3	-
- Electronic circuits II	2	1
- Measurement methods and equipment	2	-
- Fundamentals of television	2	-

(c) Specialized applied courses

- Communications	2	1
- Principles of control	2	1
- Workshop, laboratory, and maintenance	-	10
- Graduation project	-	2

Total	21	15
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All middle institutes adhere to the educational plans prepared by the Ministry of Higher Education. The Ministry recently introduced new curricula which include social science, environmental protection, maintenance projects, and educational aids. It also introduced a measure providing for students to work for one month each year at industrial enterprises and companies of the public sector in order to become familiar with the real work environment.

It should be mentioned here that there are other middle institutes affiliated with the Ministry of Education rather than the Ministry of Industry. These institutes are also governed by policies of the Higher Council for Institutes Affairs, including admission policies. They differ from the Ministry of Industry's middle institutes in two points: their students do not receive wages or compensation during training, and they are not legally bound to serve in the public sector after graduation. This last point has been a major factor in attracting large numbers of students.

These institutes offer training in many specializations including dental medicine, computer science, and engineering.

2. Vocational training complexes

Three complexes were established in Damascus, Aleppo, and Homs by decree No. 159 dated 1965. A fourth complex was established in Deir El-Zoor by a 1986 degree. Each complex consists of a number of training centres, and for each centre a vocational school was established by a 1988 Prime Minister's decree. Thus there are four training centres/vocational schools complexes as shown below:

Name of complex	Number of centres	Specializations	Capacity (students)
1. Damascus	8	Metallurgy, electricity, textiles, automotive, carpentry and building, drawing, secretarial work.	1 119
2. Aleppo	6	Metallurgy, electricity, textiles, automotive, carpentry and building, drawing, secretarial work.	1 017
3. Homs	6	Metallurgy, electricity, textiles, automotive, carpentry and building, drawing, secretarial work.	1 082
4. Deir El-Zoor	4	Metallurgy, electricity, textiles, automotive, carpentry and building, drawing, secretarial work.	780

In addition to the existing complexes, two new ones are planned for Lathakia and Hama. The complex in Lathakia will consist of four centres offering training in metallurgy, electricity, and repair and maintenance of ships. It will have a capacity of 816 students. The Hama complex will have three centres offering training in metallurgy, automotive and electricity and will have a capacity of 540 students.

The primary training programmes at the centres consist of a nine-month training session. This intensive training is open to the staff of industrial enterprises and other companies, and also to the unemployed. It aims at providing unskilled workers with basic skills in about 23 different specializations or trades. The only prerequisite for candidates to join this programme is to have obtained an elementary education certificate. After graduation, trainees are free to choose their type and place of work, although indirectly they are encouraged to work in the public sector. The centres also organize specialized sessions for the staff of industrial enterprises upon their request and at their expense. Moreover, the Damascus centre offers English language courses at three levels to the staff of the Ministry of Industry and other ministries and establishments. The average annual enrolment in this course is about 90 students.

As mentioned previously, a vocational school was established in every training complex. The average annual enrolment in these schools is about 2,000 students, and their study programmes last two years. Applicants to these programmes must have obtained the general preparatory certificate. After graduation, the students are not obliged to serve in the public sector.

A unified school plan developed by the Ministry of Education, in coordination with the Vocational and Technical Training Directorate is applied to all vocational schools in the country. The policies governing vocational schools are formulated by a permanent ministerial committee headed by the Deputy Prime Minister. The directives of the committee are issued by the Minister of Education.

Another form of training implemented under the umbrella of the Vocational and Technical Training Directorate is apprenticeship training. Accordingly, students spend almost equal time participating in theoretical courses and working at the industrial enterprises. Between 150 and 400 trainees participate in this training programme every year.

The Directorate continuously holds training sessions to upgrade the skills of instructors. To this end, it utilizes the expertise of Syrian and foreign experts and nominates instructors to be sent abroad through the State Planning Commission to be trained in specific fields. The Directorate periodically reviews and evaluates the programmes, especially in vocational schools, and revises them to reflect the real needs of the industrial sector: for example, it recently introduced a programme in industrial safety.

As in the case of middle institutes, the enrolment of women in the training complexes (centres and schools) has increased significantly. It stands now at 35-40 per cent for trainees and 15-20 per cent for instructors, and in some specializations, such as drawing, it may exceed 90 per cent.

Some officials of the Vocational and Technical Training Directorate identified a number of problems and possible solutions, as shown below:

(a) Reliable projections are lacking vis-à-vis the numbers and levels of manpower needed by the industrial sectors (public, mixed, private), for example during the next ten years;

(b) Training materials and equipment -- especially in the field of control -- are inadequate. For example, some of the centres have numerically controlled (NC) machines, and some centres still use 1960 vintage machines;

(c) Overcrowding at the middle institutes is a problem. For example, there is an urgent need to expand the buildings and facilities of the Damascus complex, which includes applied, food, and chemical industries institutes. The same situation exists at the Aleppo complex, which includes applied, textiles, and agricultural mechanization industries institutes. In brief, the existing facilities are inadequate in view of the present student absorption policy;

(d) It is necessary to adopt a job specification system in all industrial enterprises. This would identify more precisely the levels of skills required by the industrial sector and would provide a sound basis for determining the corresponding wages and compensation for training graduates;

(e) Lecturers and instructors at the vocational training centres are underpaid;

(f) The middle institutes need training software; perhaps the United Nations could assist in this matter;

(g) It would be useful to acquaint the staff of the middle institutes and vocational training complexes with training facilities and programmes in other Arab and third-world countries. Here again, the United Nations may organize and finance missions to those countries;

(h) There is a need to assess present training policies to determine their impact on the training function in the country and their ability to coordinate the activities of all parties responsible for training. For example, students graduating from industrial secondary schools enrol in the middle institutes affiliated with the Ministry of Education. Some of these institutes offer industrial training. Thus there is an urgent need to coordinate closely the activities of the middle institutes as a whole.

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