附属資料

Minutes of Meeting
between
the Ministry of Industry and Trade
in the Hashemite Kingdom of Jordan
and
the JICA Project Formation Study Team
on
a Development Study
on
the Strengthening of Enterprise Management Capability
in
the Hashemite Kingdom of Jordan

Amman, 2 September, 1999

Dr. Mohammed Halaiqa
Secretary General
Ministry of Industry and Trade
Member of the Steering Committee of
the Jordan-Japan Industrial Development
Cooperation Program

Mr. Takumi Ueshima
Leader
Project Formation Study Team
Japan International Cooperation
Agency (JICA)

WITNESS

Eng. Mustafa Zaharan
Director of Productive Projcets Department
Ministry of Planning

A project formation study team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Takumi Ueshima, visited the Hashemite Kingdom of Jordan from 28th of August to 6th of September, 1999, in order to have preliminary discussions with the Jordanian authorities concerned on a prospective development study project on the strengthening of enterprise management capability in the Hashemite Kingdom of Jordan (hereinafter referred to as "the Study").

The Team had a series of discussions on the subject matter with the representatives of the Jordanian authorities concerned (hereinafter referred to as "the Jordanian side"). A list of attendants of the meetings is given as Annex I.

This minutes of meeting summarizes the major points discussed and agreed on in the series of meetings.

I. Conclusion

(1) The Team and the Jordanian side (hereinafter collectively referred to as "the both sides") reconfirmed that the Study is to be conducted in such a way that it will comply with the objective of the on-going program of Japanese cooperation to support Hashemite Kingdom of Jordan to promote its industrial development which started on September, 1998 (hereinafter referred to as "the on-going Jordan-Japan Industrial Development Cooperation Program").

(2) Both sides discussed the possible implementing framework of the Study based on a presentation paper prepared by the Team. After extensive discussions, both sides came to agree on the general framework of the Study as mentioned in article II, III below, while maintaining that such agreement is tentative at this point.

(3) It was confirmed by both sides that the official request document for the Study should be promptly forwarded to the Government of Japan from the Jordanian side through diplomatic channel in order to proceed with the next step, and that implementing arrangement for the Study is to be finalized after getting official approval by the Government of Japan.

II. Outline of the Study

Both sides agreed on the outline of the Study below (see also Annex II).

(1) Expected output of the Study

1) Formulation of a master plan and action plans for strengthening enterprise management capability in the Hashemite Kingdom of Jordan, with a view of increasing the international competitiveness of Jordanian manufacturing industry
2) Transfer of expertise to Jordanian counterpart on the diagnostic study and management consulting methods
3) Enhance the awareness of Jordanian enterprises on managerial capability, with special emphasis on marketing and industrial design.

(2) Specific works of the Study

The Study will be conducted following the steps as shown below:

1. Diagnostic studies
   1-1 Review of the performances of the selected sub-sectors
   1-2 Selection of the representative enterprises for diagnosis
   1-3 Diagnostic studies for representative enterprises
   1-4 Recommendations for improvement of competitiveness
   1-5 Guidance for implementing the recommendations
   1-6 Compilation of reference manuals and studies reports

2. Case Study in a workshop
   2-1 Selection of specific products for case study, based on the results of diagnostic study
   2-2 Conducting a workshop with special emphasis on marketing and industrial design
   2-3 Compilation of major findings of the case study

3. Formulation of a master plan with action plans for strengthening enterprise management capability
   3-1 Examination of the effectiveness of services and facilities available
   3-2 Formulation of a set of policy recommendations on institutional support for enterprises
   3-3 Formulation of specific and practical measures to be taken by individual companies for improvement of their management capability in terms of marketing and industrial design
   3-4 Suggestions for policy measures for creating a better business environment

(3) Sub-Sector to be covered by the Study

The Study will focus on electric and electronics industry with related supporting engineering industry such as plastic molding and metal working.

III. Organizational Setup for the Implementation of the Study

(1) Steering committee

The Steering Committee being organized for the on-going Jordan-Japan Industrial Development Cooperation Program under the chairmanship of the Secretary General of the Higher Council for Science and Technology, will steer and supervise the Study in order to ensure coherent and smooth implementation of the Study.

(2) Responsible agency and counterpart body

1)Both sides confirmed that the Study is going to be a collaborative work and that assuring active participation and involvement of the various parties concerned in the implementation process will be essential for the success of the Study. It is also understood that competent counterpart personnel should be assigned because JICA Study Team is planning, throughout the process of the Study, to transfer technology to Jordanian counterpart for the purpose of furthering their knowledge and skills.

2)The Jordanian side mentioned that the Ministry of Industry and Trade (hereinafter referred to as "MIT") will be the agency responsible for the implementation of the Study, and the "National Counterpart Team" consisting of the following members is to be organized as counterpart body of JICA Study Team. Industrial Development Directorate (hereinafter referred as to "IDD")/MIT was selected because by Jordanian law it is the body mandated to provide support and services to industrial sector in Jordan.

-Director of IDD as the leader of the "National Counterpart Team"
-Staff of IDD as core members of the "National Counterpart Team"
-Staff of the Ministry of Planning
-Staff of the Royal Scientific Society
-Staff of the Jordan Export Development & Commercial Centers Corporation
-Staff of the Investment Promotion Corporation

3)The "National Counterpart Team" will participate directly in the development and implementation of the Study in order to conduct specialized diagnostic analysis and thereby contributing to the formulation of appropriate industrial policies

4) All members of the "National Counterpart Team" will be housed in IDD/MIT

5) Both sides agreed to organize a "National Counterpart Team" the composition of which is as follows.

(a) Leader
(b) Policies & Measures
(c) Marketing**
(d) Industrial Design**
(e) Technology *
(f) Management*

The terms of reference of each member is to be defined with the approval by the Government of Japan.

(Note)

1) Asterisk(*) should be appointed on full-time basis throughout the Study
2) Asterisk(**) should be appointed on full-time basis at least while the corresponding experts of JICA Study Team stay in Jordan.
3) All counterpart personnel are expected to work at the related field in the government and/or non-governmental organizations, to have enough knowledge and experience to join the Study, and to continue their work after completion of the Study to disseminate its result.
4) Jordanian counterpart will participate the Study at its own expense.

ANNEX I

LIST OF ATTENDANCE

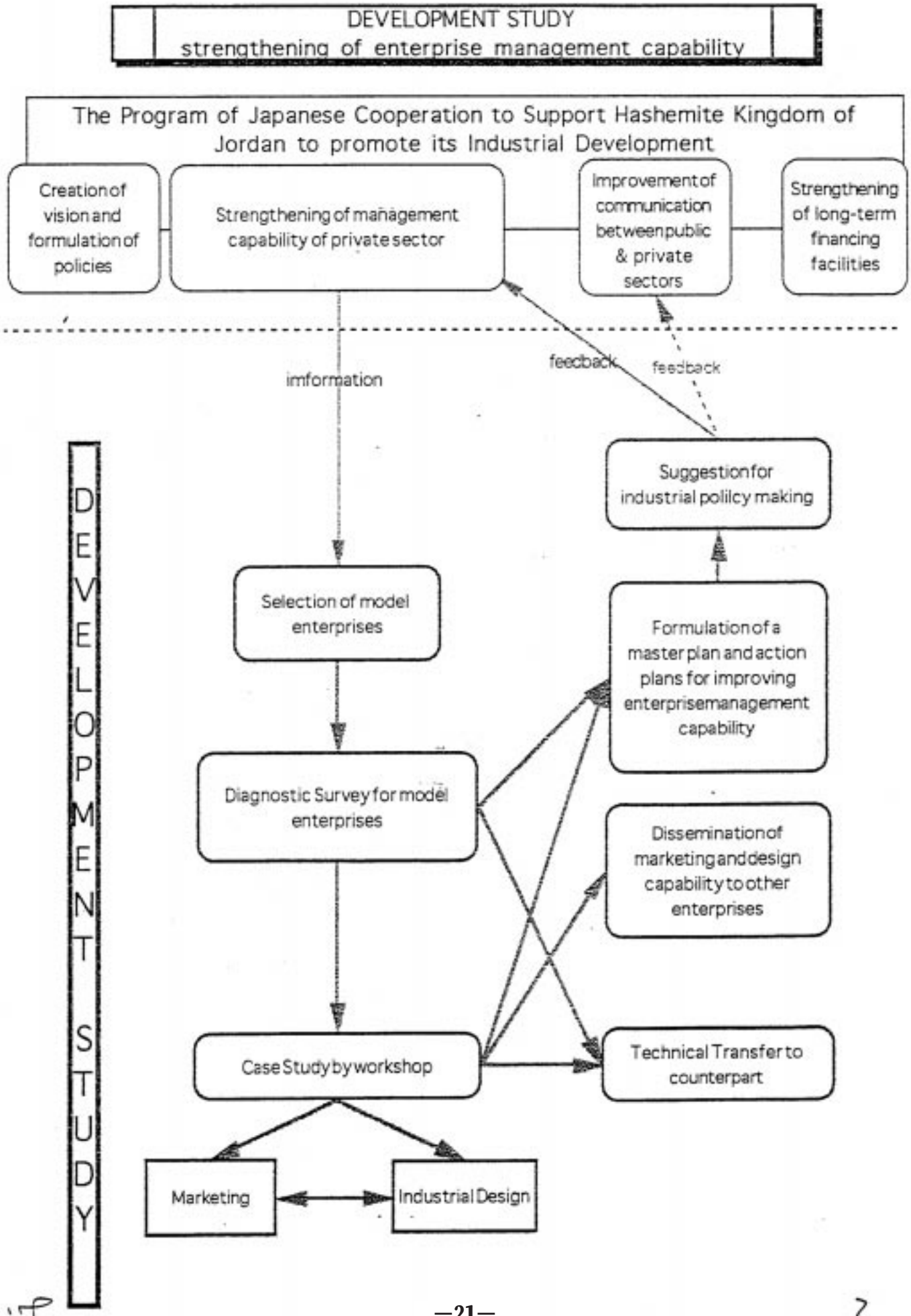
Jordanian side

Dr. Mohammed Halaiqa	Secretary-General of the Ministry of Industry and Trade
Dr. Said Alloush	President of the Royal Scientific Society
Dr. Ahmad Mango	Advisor to His Royal Highness Prince El-Hassan
Mr. Mustafa Zahran	Assistant Secretary General of the Ministry of Planning
Eng. Isam Mustafa	Industrial Sector The Higher Council for Science and Technology
Dr. Ahmad Thogan Hindawi	Director of the Industrial Development Directorate Ministry of Industry and Trade
Mr. Shin Tanaka	JICA expert, The Higher Council for Science and Technology

Japanese side

[JICA Project Formation Team]

Mr. Yuji Hosoya	Director for Human Resource Development Technical Cooperation Division Ministry of International Trade and Industry (MITI)
Mr. Takumi Ueshima	Director of Industrial Development Study Division Japan International Cooperation Agency (JICA)
Mr. Yasuaki Yoneyama	Official, The First Middle East Division Ministry of Foreign Affairs (MOFA)
Mr. Tsunenobu Miki	Development Specialist Japan International Cooperation Agency (JICA)
Ms. Yumiko Asakuma	Project Officer, Industrial Development Study Division Japan International Cooperation Agency (JICA)
Mr. Yoshio Yabe	Resident Representative, JICA Jordan Office
Mr. Masaaki Iwai	Assistant Resident Representative, JICA Jordan Office
Mr. Hani H. Alkurdi	Program Officer, JICA Jordan Office


DEVELOPMENT STUDY
strengthening of enterprise management capability
The Program of Japanese Cooperation to Support Hashemite Kingdom of Jordan to promote its Industrial Development
Creation of vision and formulation of policies
Strengthening of management capability of private sector
Improvement of communication between public & private sectors
Strengthening of long-term financing facilities
information
feedback
feedback
Suggestion for industrial polilcy making
Selection of model enterprises
Formulation of a master plan and action plans for improving enterprise management capability
Diagnostic Survey for model enterprises
Dissemination of marketing and design capability to other enterprises
Case Study by workshop
Technical Transfer to counterpart
Marketing
Industrial Design
DEVELOPMENT STUDY

別添　2

Scope of Work
for
a Study
on
the Strengthening of Enterprises Management Capability
in
the Hashemite Kingdom of Jordan
agreed upon between
the Ministry of Industry and Trade
and
the Japan International Cooperation Agency (JICA)

Amman, 27th November, 1999

Dr. Mohammed Halaiqah
Secretary General
Ministry of Industry and Trade
The Hashemite Kingdom of Jordan

Mr. Yoshio Yabe
Resident Representative
JICA Jordan Office
Japan International Cooperation Agency
Japan

WITNESS

Eng. Mustafa Zaharan
Director of Productive Project Department
Ministry of Planning

I. INTRODUCTION

In response to the request of the Government of the Hashemite Kingdom of Jordan, the Government of Japan decided to conduct a Study on the Strengthening of Enterprises Management Capability in the Hashemite Kingdom of Jordan (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of the Hashemite Kingdom of Jordan.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The overall goal of the Study is to contribute to the improvement of the competitiveness of Jordanian manufacturing industry by strengthening of enterprise management capability.

Specific objectives of the Study will include:

1) Formulation of a master plan and action plans for strengthening enterprise management capability in the Hashemite Kingdom of Jordan;
2) Transfer of expertise to Jordanian counterparts on diagnostic study and management consulting methods;
3) Enhancement of the awareness of Jordanian enterprises on managerial capability, with special emphasis on marketing and industrial design.

For in-depth coverage, the Study will focus on industrial sub-sectors in the electric and electronics industry, and related supporting engineering industries such as plastic molding and metalworking.

Outcome from the Study should be considered together with the outcomes of the activities of the detailed action plan of the Jordan-Japan Industrial Development Program, which started on September, 1998.

III. SCOPE OF THE STUDY

In order to achieve the above objectives, the study shall cover the following

items:

1. Diagnostic studies
   1-1 Review of the performances of the selected sub-sectors
   1-2 Selection of the representative enterprises for diagnosis
   1-3 Diagnostic studies for representative enterprises
   1-4 Recommendations for improvement of competitiveness
   1-5 Guidance in implementing the recommendations
   1-6 Compilation of reference manuals and study reports

2. Case Study in a workshop
   2-1 Selection of specific products for a case study, based on the results of diagnostic studies
   2-2 Conducting a workshop with special emphasis on marketing and industrial design
   2-3 Compilation of major findings of the case study

3. Formulation of a master plan with action plans for strengthening enterprise management capability
   3-1 Examination of the effectiveness of services and facilities available
   3-2 Formulation of a set of policy recommendations on institutional support for enterprises
   3-3 Formulation of specific and practical measures to be taken by individual companies for improvement of their management capability in terms of marketing and industrial design
   3-4 Suggestions for policy measures for creating a better business environment

IV. WORK SCHEDULE

The Study will be carried out in accordance with the attached tentative work schedule.

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Jordan in accordance with the attached tentative work schedule.

Ten (10) copies of the Inception Report
Twenty (20) copies of the Interim Report
Thirty (30) copies of the Draft Final Report with a summary

Thirty (30) copies of the Final Report with a summary

VI. UNDERTAKINGS BY THE GOVERNMENT OF JORDAN

1. The Government of Jordan shall accord privileges, exemptions, and other benefits to the Japanese study team in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Jordan.

2. To facilitate smooth conduct of the Study, the Government of Jordan shall take necessary measures:

2-1 to secure the safety of the Japanese study team;

2-2 to permit the members of the Japanese study team to enter, leave and sojourn in Jordan for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees;

2-3 to exempt the members of the Japanese study team from taxes, duties and other charges on equipment, machinery and other materials brought into Jordan for the conduct of the Study;

2-4 to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study;

2-5 to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into Jordan from Japan in connection with the implementation of the Study;

2-6 to secure permission for entry onto private properties or into restricted areas for the conduct of the Study;

2-7 to secure permission for the Japanese study team to take all data and documents (including photographs) related to the Study out of Jordan to Japan, and

2-8 to provide medical services as needed. Medical expenses will be chargeable to members of the Japanese study team

3. The Government of Jordan shall bear claims, if any arise, against members of

the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

3. The Ministry of Trade and Industry shall act as a counterpart agency to the Japanese study team and also as a coordinating body in relations with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. The Ministry of Trade and Industry shall, at its own expense, provide the Japanese study team with the following, in cooperation with other organizations concerned;

4-1 available data and information related to the Study
4-2 counterpart personnel,
4-3 suitable office space with necessary equipment in Amman, and
4-4 credentials or identification cards.

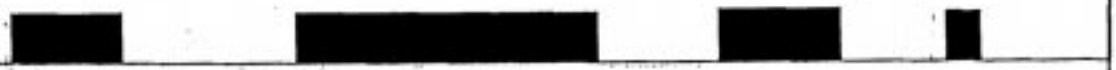
VII UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:
(1) to dispatch, as its own expense, study teams to Jordan, and
(2) to pursue technology transfer to the Jordan counterpart personnel in the course of the Study,

VIII OTHERS

JICA and the Ministry of Trade and Industry shall consult with each other in respect of any matter that may arise from or in connection with the Study.

TENTATIVE SCHEDULE OF THE STUDY

Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Order of month	1	2	3	4	5	6	7	8	9	10	11	12	13
Year	2000											2001	
Work in Jordan													
Work in Japan													
Report	△ IC/R								△ IT/R		△ DF/R		△ F/R

IC/R: Inception Report

IT/R: Interim Report

DF/R: Draft Final Report

F/R: Final Report

Minutes of Meeting

for

a Study

on

the Strengthening of Enterprises Management Capability

in

the Hashemite Kingdom of Jordan

agreed upon between

the Ministry of Industry and Trade

and

the Japan International Cooperation Agency (JICA)

Amman, 27th November, 1999

Dr. Mohammed Halaiqah
Secretary General
Ministry of Industry and Trade
The Hashemite Kingdom of Jordan

Mr. Yoshio Yabe
Resident Representative
JICA Jordan Office
Japan International Cooperation Agency
Japan

WITNESS

Eng. Mustafa Zaharan
Director of Productive Project Department
Ministry of Planning

With reference to the Scope of Work signed 27th of November, 1999, in Amman, for the Study on the Strengthening of Enterprises Management Capability in the Hashemite Kingdom of Jordan (hereinafter referred to as "the Study"), the representatives of the Ministry of Industry and Trade (hereinafter referred to as "MIT") and other authorities concerned of the Government of Jordan and the representative of the Japan International Cooperation Agency (hereinafter referred to as "JICA") agreed to confirm the following points related to the Study in addition to the items included in the Scope of Work.

I. Flow of the Study

The Operational flow of the Study is as given in Annex I. The points to be noted with regard to the flow of the Study are as follows:

(1) Diagnostic Study

1) Preparatory Survey

Visit surveys to 20-30 enterprises manufacturing electric/electronics products or their parts and components will be carried out for the purpose of selecting sample products for a case study of marketing and industrial design, and representative enterprises for the diagnostic studies. The representative enterprises should have willingness to cooperate with the Study, including disclosure of information necessary for the Study.

2) Diagnostic Studies

After the selection of the representative enterprises, diagnostic studies will be conducted in order to identify the problems, advantages and disadvantages of individual enterprises, and to provide them with practical guidance regarding development of marketing, technology (plastic injection and/or metalworking), and production management to improve their competitiveness in the international market.

The studies will also try to identify problems which Jordanian enterprises have in common, and/or problems that are beyond the control of individual enterprises. Such findings will be used in compiling policy recommendations for the Jordanian Government so that it can create a better business

environment.

The diagnostic study for each representative enterprise will be conducted repeatedly together with Jordanian counterparts. The JICA Study Team will try to transfer diagnostic methods to their counterparts so that follow-up diagnostic studies can be conducted by the Jordanian counterparts during the JICA Study Team's absence.

(2) Marketing

The JICA Study Team will conduct marketing research on the selected electric/electronics products (home electric appliance) both in Jordan and in neighboring Middle Eastern countries. Marketing research will be conducted twice. The first such research will be conducted to find out the following:

-price, design, and function of the products being consumed in the area;
-needs of dealers and customers for the products;
-history, culture, foods and lifestyle.

The result will be utilized for the case study on the development of industrial design, and diagnostic studies of the representative enterprises.

After the completion of the workshop of industrial design, marketing research will be conducted again to ascertain marketability of prototype products in the targeted area.

Jordanian counterparts of the Study and personnel from the private sector will be encouraged to join the marketing research tour, however expenses for joining the tour as transportation and accommodation fee will be borne by the participants themselves.

A marketing research report will be prepared by the JICA Study Team, which is expected to serve as an important reference material for disseminating methods of marketing research.

(3) Workshop on Industrial Design

The JICA Study Team and Jordanian counterparts will jointly conduct a workshop for development of industrial design of selected electric/electronics products.

The organizers/coordinators of the workshop will be the members of the JICA Study Team and their corresponding counterparts. The number of participants will

be approximately 6-8 persons from relevant enterprises for each product. Details of the workshop will be discussed and determined by both the JICA Study Team and the Jordanian side at the First Field Survey.

II. Organizational Setup for the Implementation of the Study

(1) Steering Committee

For smooth implementation of the study, Jordanian side will establish a steering committee to coordinate its inter-ministrial issues related to the Study. In order to ensure coherent implementation, the Steering Committee for the on-going Jordan-Japan Industrial Development Cooperation Program will act as the steering committee for the Study.

(2) Responsible agency and counterpart

The MIT is the agency responsible for the implementation of the Study, and a "National Counterpart Team" consisting of members from the Industrial Development Directorate (hereinafter referred to as "IDD) of the MIT, Ministry of Planning, Royal Scientific Society, Jordan Export Development & Commercial Centers Corporation, and Investment Promotion Corporation is to be organized as the counterpart body of JICA Study Team. The director of the IDD will be the leader of the "National Counterpart Team" and the staff of the IDD will be its core members. The members of the "National Counterpart Team" will be assigned by the time the Study begins.

The "National Counterpart Team" will be housed in the MIT/IDD.

The "National Counterpart Team" will be composed of following members:

1) Team Leader - the Director of MIT/IDD
   -responsible for the Study on Jordanian side
   -will organize and coordinate the "National Counterpart Team"
2) Policy and Measures counterpart(s)
   -will work with a Japanese consultant to get relevant data and information
3) Marketing** counterpart(s)
   -will participate in marketing research activities in Jordan and neighboring countries
   -will conduct a diagnostic study with a Japanese consultant
4) Industrial Design** counterpart(s)

-will conduct a workshop with a Japanese consultant (both will serve as coordinators)

5) Plastic Injection counterpart(s)
(injection, painting/coating, die molding, hot stamp, etc.)*
-will conduct a diagnostic study with a Japanese consultant
-will perform follow-up diagnostic studies of the model enterprises during the Japanese consultant's absence

6) Metalworking counterpart(s) (press, founding, extraction, die, etc.)*
-will conduct a diagnostic study with a Japanese consultant
-will perform follow-up diagnostic studies of the model enterprises during the Japanese consultant's absence

7) Production Management* counterpart(s)
(process, quality, facility and other corporate management)
-will conduct a diagnostic study with the Japanese consultant
-will perform follow-up diagnostic studies of the model enterprises during the Japanese consultant's absence

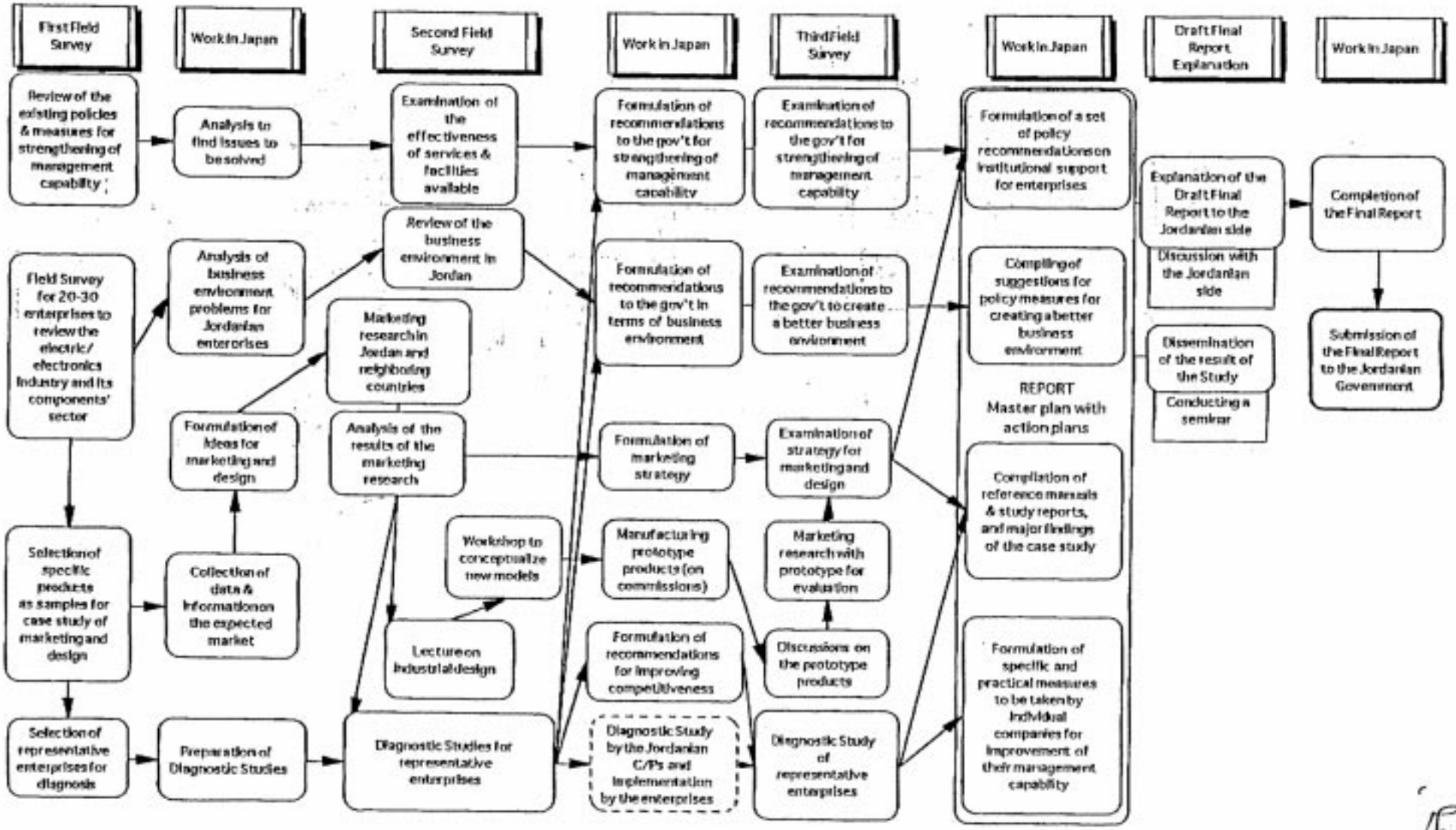
Each counterpart will also support and make suggestions to the JICA Study Team for formulation of a master plan and action plans, if necessary.

(Note)
1) Asterisk (*) should be appointed on a full-time basis throughout the Study.
2) Asterisk (**) should be appointed on a full-time basis at least while the corresponding experts of the JICA Study Team stay in Jordan.
3) Jordanian counterparts will participate in the Study at their own expense.

The JICA Study Team is planning to transfer technology to Jordanian counterparts throughout the process of the Study for the purpose of furthering their knowledge and skills. All counterpart personnel are expected to be working in related fields for the government and/or non-governmental organizations, to have enough knowledge and experience to join the Study, and to continue their work after completion of the Study to disseminate its result.

DEVELOPMENT STUDY ON STRENGTHENING OF ENTERPRISES MANAGEMENT CAPABILITY

ANNEX I



ROYAL SCIENTIFIC SOCIETY

A National Institution for
Research and Industrial Services

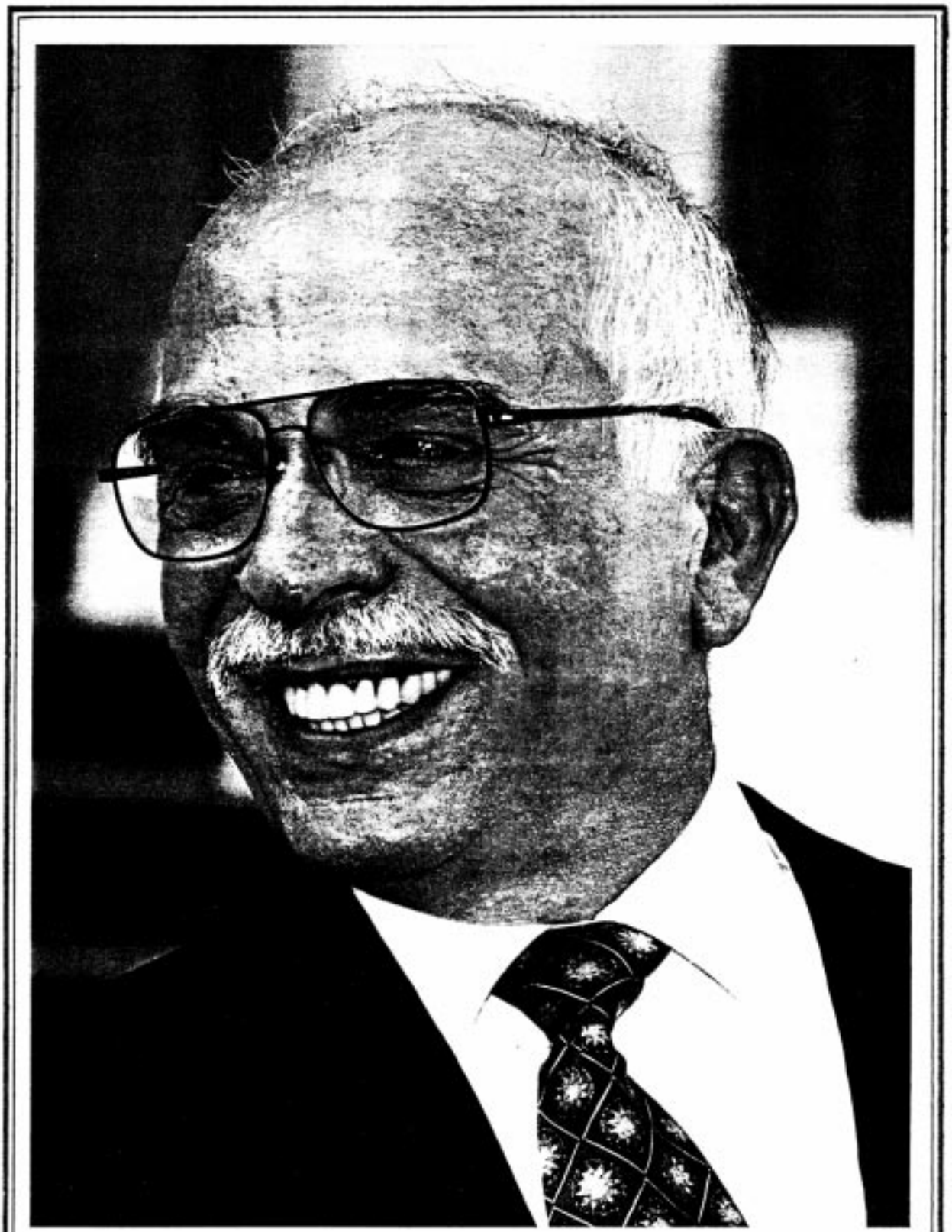
Annual Report

1998

Royal Scientific Society

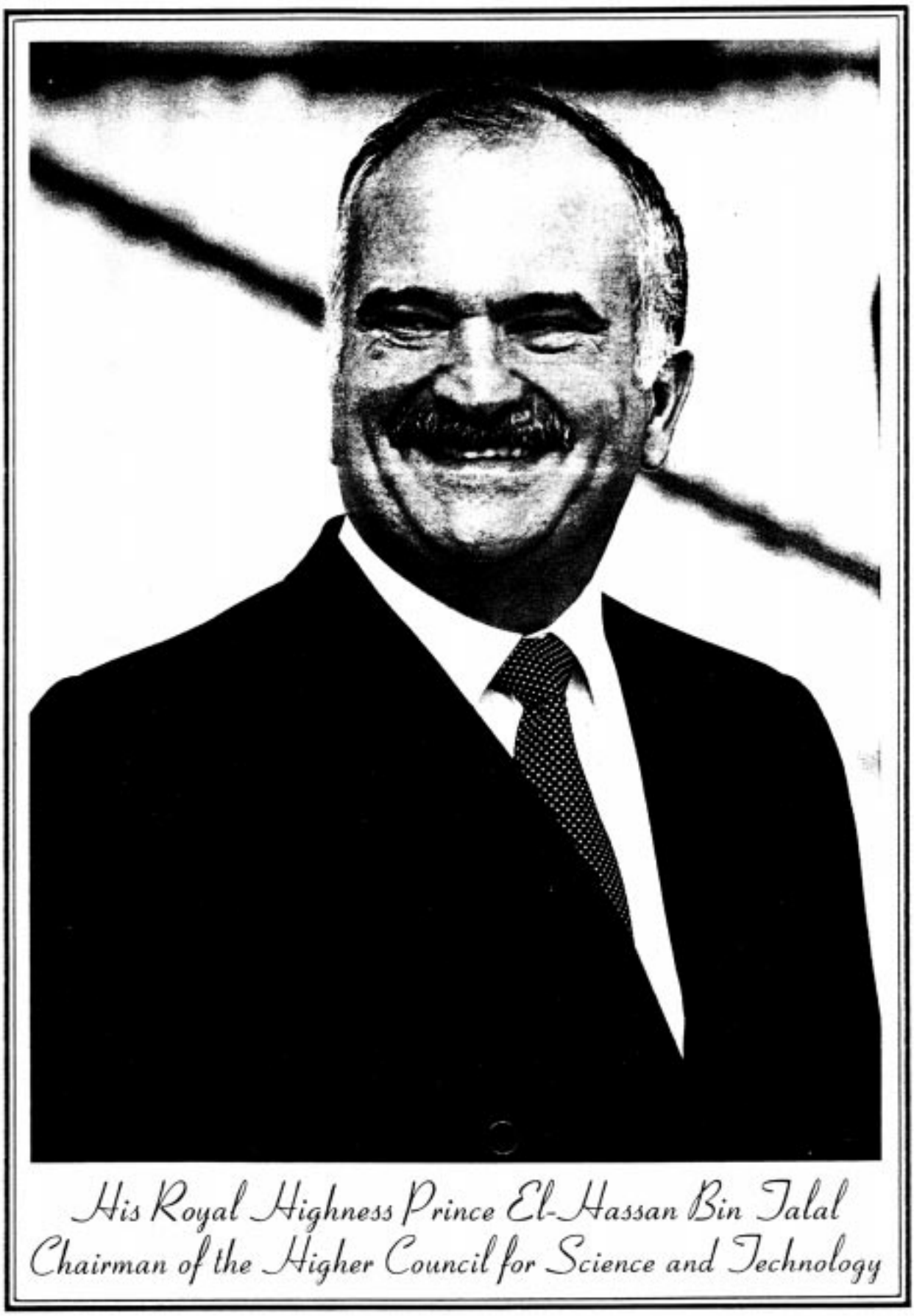
Annual Report

1998



His Majesty the Late King Hussein Bin Talal

His Majesty King Abdullah Bin El-Hussein



His Royal Highness Prince El-Hassan Bin Talal
Chairman of the Higher Council for Science and Technology

Contents

Introduction

The Royal Scientific Society (RSS) this year strenuously entrenched its standing in the scientific and technological spheres, as it directed a lot of its efforts towards tackling present issues of extraordinary importance along with its mission of handling current affairs. It formed a committee in charge of tackling the computer problem of the year 2000 in relation to its systems and the systems of the institutions it serves, and participated in setting a comprehensive plan to help the private and public institutions tackle this problem. RSS also participated in seminars and conferences at the local and regional levels by presenting relevant working papers, and in technical committees at the national level to set policies, strategies, and solutions to this problem before the year 2000. Moreover, RSS intensified its activities of monitoring water quality in Amman area when the problem of drinking water pollution emerged in the area, and presented successive reports in this regard to the concerned authorities. RSS also continued to present its water monitoring services in the regions of Zai, Jordan and Yarmouk rivers, King Talal Dam, As-Samra wastewater treatment plant, water flowing into King Abdullah Canal, as well as various sites of wastewater and sewage water. All such activities were conducted through firm cooperation with the various concerned public and private institutions.

RSS continued to intensify efforts and contacts with the international institutions concerned with laboratory accreditation with the purpose of meeting the requirements needed to achieve the desired accreditation of its laboratories. The Calibration Laboratory of the RSS Electronic Services and Training Centre has already acquired international accreditation by the Physikalisch-Technische Bundesanstalt (PTB-German Metrology Institute). Much efforts are still being exerted to acquire accreditation for some other RSS laboratories, particularly the Quality Assurance and Control Laboratory functioning in the electric and electronic fields.

Based on RSS mission of meeting the needs of society and development through opening new channels of activity, a new laboratory, specialized in testing cigarettes and supplied with the needed equipment, was opened on October 1st this year and it assumed its activities in accordance with the Jordanian and international specifications. The establishment of this laboratory was triggered by the importance of bringing imported and locally-produced cigarettes under control. Another laboratory for testing central heating boilers and radiators was also established this year to provide relevant technical services and test the thermal capacity of locally-made and imported boilers and radiators to determine their compliance with locally and internationally accredited standards.

RSS continued to follow up the mission for which it was established, namely serving the development sectors in Jordan, particularly the industrial sector. It added significant achievements in its pertinent fields of operation which include computer technology and applications, mechanical technology and design, building technology, environment, renewable energy, industrial chemistry, electronic services, and training. It conducted several technical, specialized and applied research studies,

and presented technical consultation services in the various fields of development that fall within its sphere of competence. It also signed dozens of agreements with several national industries and institutions with the purpose of upgrading the quality of products and solving the problems which face industry. Furthermore, it increased cooperation with the governmental parties concerned with testing and controlling locally-made and imported commodities with the aim of checking their quality, validity and compliance with the accredited specifications.

At the regional and international levels, RSS carried out several activities at the Arab and international levels foremost of which was signing a memorandum of understanding with Lloyd's Register Quality Assurance Limited in the field of management systems evaluation, including environmental quality management systems, as well as exchanging technical expertise and holding training courses and workshops from which Jordanian industries and institutions have benefited. Furthermore, RSS participated in important projects with international institutions, and consequently signed an agreement with Norsk Hydro of Norway to study the expected environmental impact of establishing two factories to produce fertilizers in Shidia and Aqaba.

In line with its keenness to develop human resources, RSS continued to provide specialized short and long-term technical training courses for Jordanians and Arabs on its relevant fields of competence. In addition, RSS continued providing distinguished academic education through its affiliated Princess Sumaya University College for Technology (PSUCT) where a total of (1015) students pursue studies in the fields of computer science and electronic engineering. This year witnessed the graduation of (129) students comprising the fourth batch of students majoring in computer science and the first batch of students majoring in electronic engineering, who have the capacity to directly get enrolled in work with no need for further practical training. RSS also completed building the PSUCT annex which houses the college's administration and computer department with an area of (4035) square metres.

As I present this report to those who are interested in following up RSS achievements and contributions in the various fields of science and technology in Jordan, I pray God, the Almighty, to bestow His mercy upon His Majesty the Late King Hussein for His continual support and encouragement to our institution and its employees during His propitious reign. I also convey my profound allegiance and gratitude to His Majesty King Abdullah, may God protect Him, for His continual backing and support for RSS and its employees, and to His Royal Highness Prince El-Hassan, Chairman of the Higher Council for Science and Technology, may God protect Him, for the continuous support, guidance and attention His Highness has been providing our establishment and its employees with since its inception. My thanks are also due to all members of the Higher Council for Science and Technology, all officials, and all those who deal with RSS for their support and understanding of RSS mission in the service of development objectives. In the end, I would like to stress our firm determination in RSS to develop and promote our capabilities and services to suit Jordan's sublime position.

Dr. Said Alloush

General Information

The Royal Scientific Society was established in 1970 as a research and development institution to work in fields related to the development process in Jordan.

- RSS is a national institution enjoying financial and administrative independence.
- RSS became one of the scientific and technological centres of the Higher Council for Science and Technology as from October 1987.
- RSS is administered by a president, a vice-president, and directors of centres and departments.
- RSS started its activities at offices of the Central Bank of Jordan, and then at a rented building in Amman. In 1972, RSS moved to its present permanent site in Jubaiha, near Amman.
- The area of the permanent site is 340000 square meters.
- The buildings and laboratories of RSS cover a floor area of 31640 square metres.
- The budget of RSS is derived from self-generated revenues from technical services and consultations, research contracts, an annual grant from the Government of Jordan, grants and donations from local institutions, and technical assistance from a number of industrial countries as well as from regional and international organizations.
- RSS comprises the following centres and departments:
  - Computer Technology, Training and Industrial Studies Centre,
  - Electronic Services and Training Centre,
  - Mechanical Design and Technology Centre,
  - Building Research Centre,
  - Industrial Chemistry Centre,
  - Renewable Energy Research Centre,
  - Environmental Research Centre,
  - Administrative Department,
  - Financial Department,
  - Quality Assurance Department,
  - Financial Audit and Communications Department,
  - Princess Sumaya University College for Technology.
  - RSS cooperates with a number of research institutions, universities, organizations, councils, centres and establishments at the Arab, regional and international levels through agreements, memoranda of understanding and contract research and studies.
  - RSS is a member of several Arab, regional and international unions, federations, councils, associations, organizations and societies.

Aims and Functions

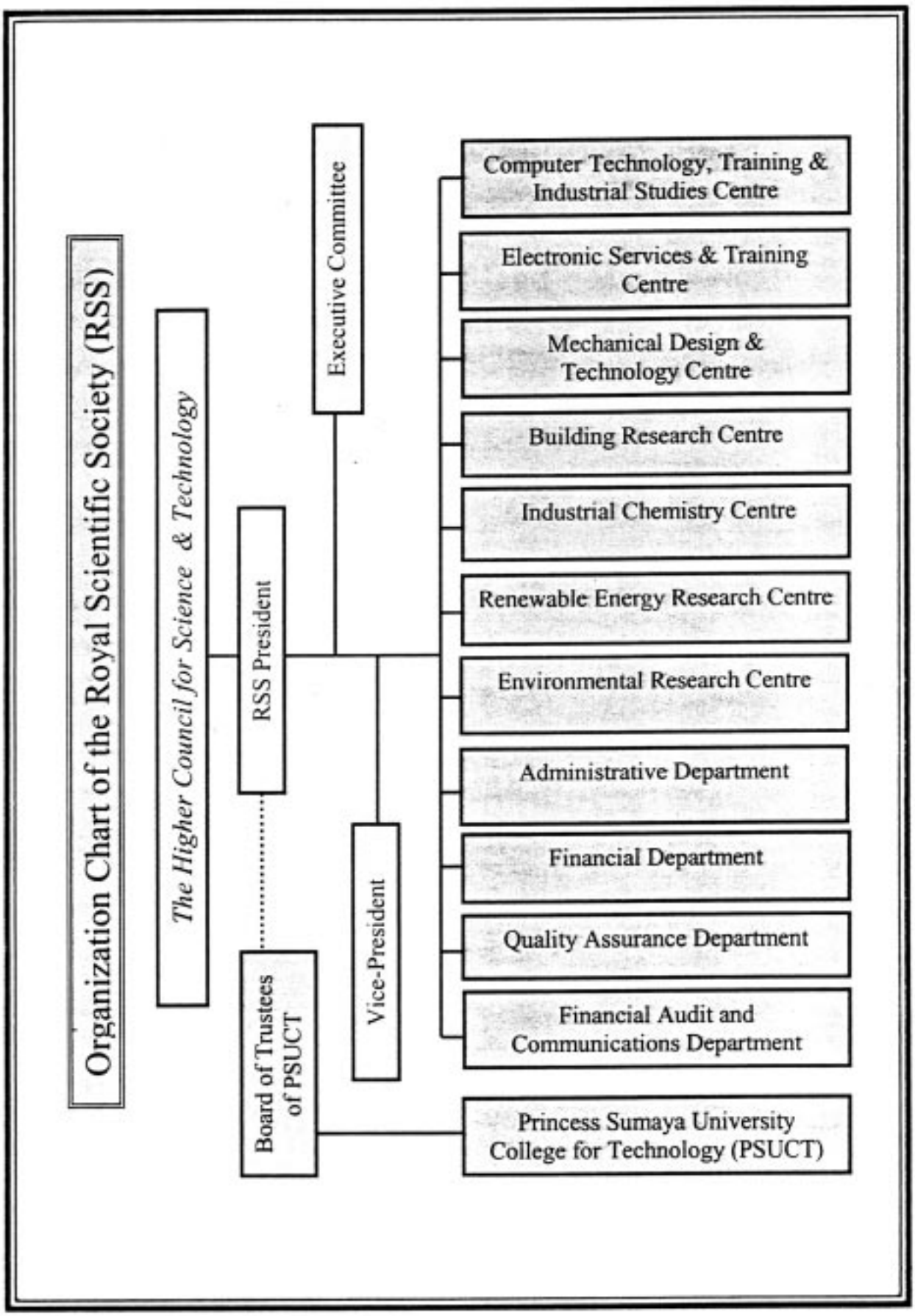
Aims

The Royal Scientific Society (RSS) aims at conducting scientific and technological research and development work related to the development process in Jordan with special attention to industrial research and services. It also aims at disseminating awareness in the scientific and technological fields and at providing specialized technical consultations and services to the public and private sectors. It seeks to develop scientific and technological cooperation with similar institutions within the Arab world and internationally.

Functions

1. Carrying out studies and conducting applied scientific research related to industry in particular and to the various areas of development in general.
2. Conducting economic and technical feasibility and analytical studies with regard to development projects which fall within the RSS scope of interest.
3. Carrying out studies and research in the field of vocational and industrial education and producing books and publications in support of training and the industrialization process.
4. Conducting research on a contract basis with institutions in Jordan and abroad.
5. Carrying out joint research with scientific, production-oriented and service institutions at the national, Arab and international levels.
6. Conducting research and development work leading to the production of prototypes for possible application in industry.
7. Developing its laboratories, providing them with up-to-date equipment and orienting them towards serving the objectives of scientific and technological research and the needs of the public and private sectors.
8. Carrying out tests and experimental work on materials as well as on finished and intermediate goods and providing related technical consultations to the users.
9. Contributing to the solution of technical problems facing various organizations, particularly industrial establishments.
10. Cooperating with agencies concerned with the establishment of national technical standards and specifications and providing technical services which would facilitate their application and ensure proper quality control of goods and materials.
11. Attracting qualified Jordanian and Arab personnel and providing them with favourable working conditions.
12. Upgrading human capabilities and technical skills through the provision of distinctive training opportunities.

13. Producing books and other publications in the area of science and technology which contribute to the effective dissemination of scientific and technological concepts.
14. Preparing and servicing information systems in addition to processing, programming and implementing computer systems.
15. Contributing to the transfer and adaptation of technology and selecting appropriate technologies related to the RSS scope and fields of expertise.
16. Cooperating in science and technology with local, Arab and other organizations for the purpose of exchanging information and expertise and conducting joint research.
17. Developing the instruments of scientific and technological management and the methods of setting up national science and technology policies and providing consultations in this regard at the national and Arab levels.
18. Contributing to the development of the Arab region through providing technical services and consultations and creating opportunities for specialized technical training.


Organization Chart of the Royal Scientific Society (RSS)
The Higher Council for Science & Technology
RSS President
Executive Committee
Board of Trustees of PSUCT
Vice-President
Computer Technology, Training & Industrial Studies Centre
Electronic Services & Training Centre
Mechanical Design & Technology Centre
Building Research Centre
Industrial Chemistry Centre
Renewable Energy Research Centre
Environmental Research Centre
Administrative Department
Financial Department
Quality Assurance Department
Financial Audit and Communications Department
Princess Sumaya University College for Technology (PSUCT)

The Higher Council for Science and Technology (HCST)

His Royal Highness Prince El-Hassan Bin Talal - Chairman

- Members of HCST (in their official capacity)

  - The Minister of Planning
  - The Minister of Industry and Trade
  - The Minister of Finance
  - The Minister of Higher Education
  - The Minister of Energy and Mineral Resources
  - The Minister of Agriculture
  - The Chairman of the Joint Chiefs of Staff
  - The Chairman of the Amman Chamber of Industry
  - The President of the Royal Scientific Society
  - The Secretary General of the Higher Council for Science and Technology

- Members of HCST (in their personal capacity)

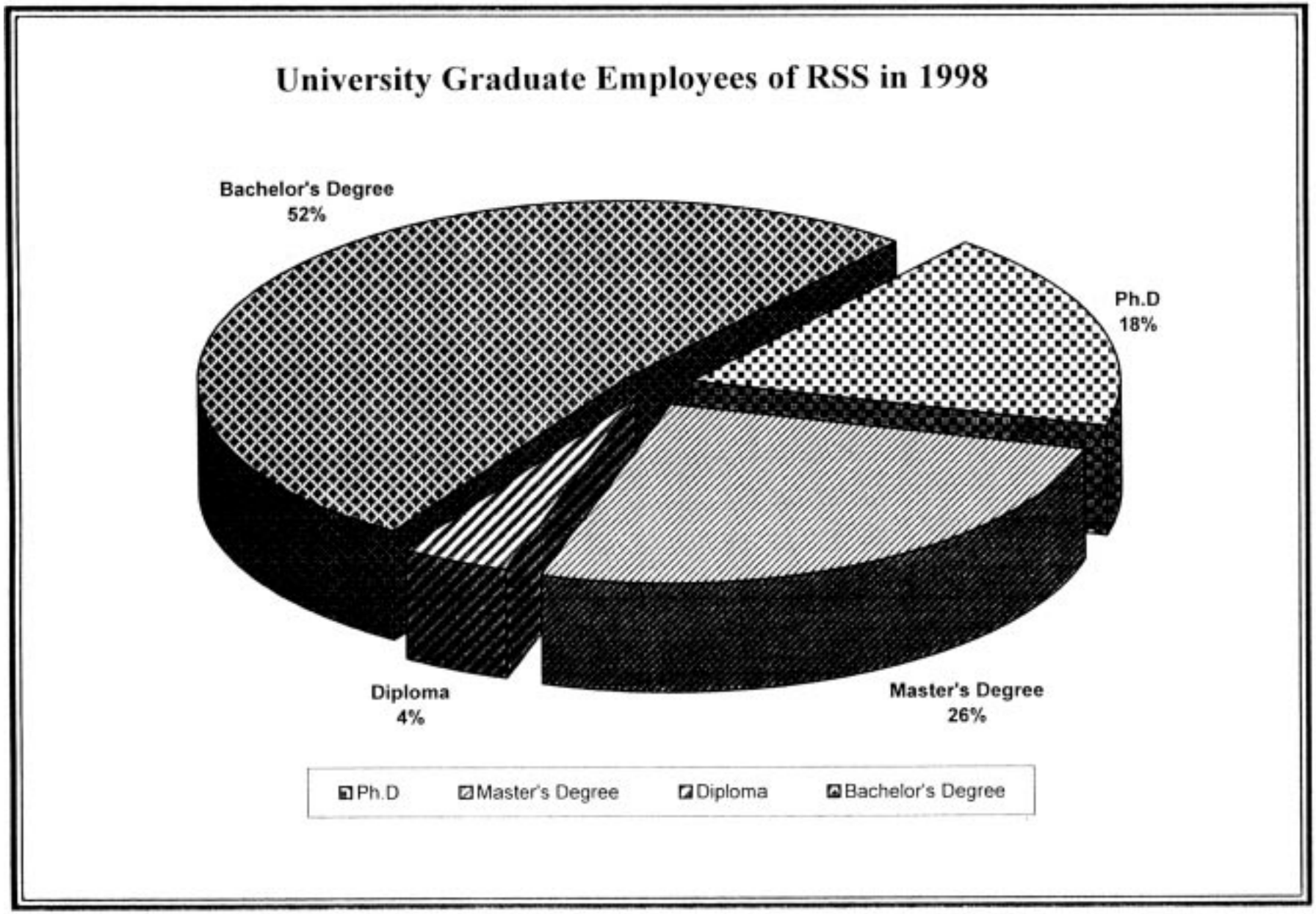
  - Dr. Abdul Salam Al-Majali
  - Dr. Kamel Al-Ajlouni
  - Dr. Usama Al-Khalidi

President and Directors of Centres and Departments at RSS

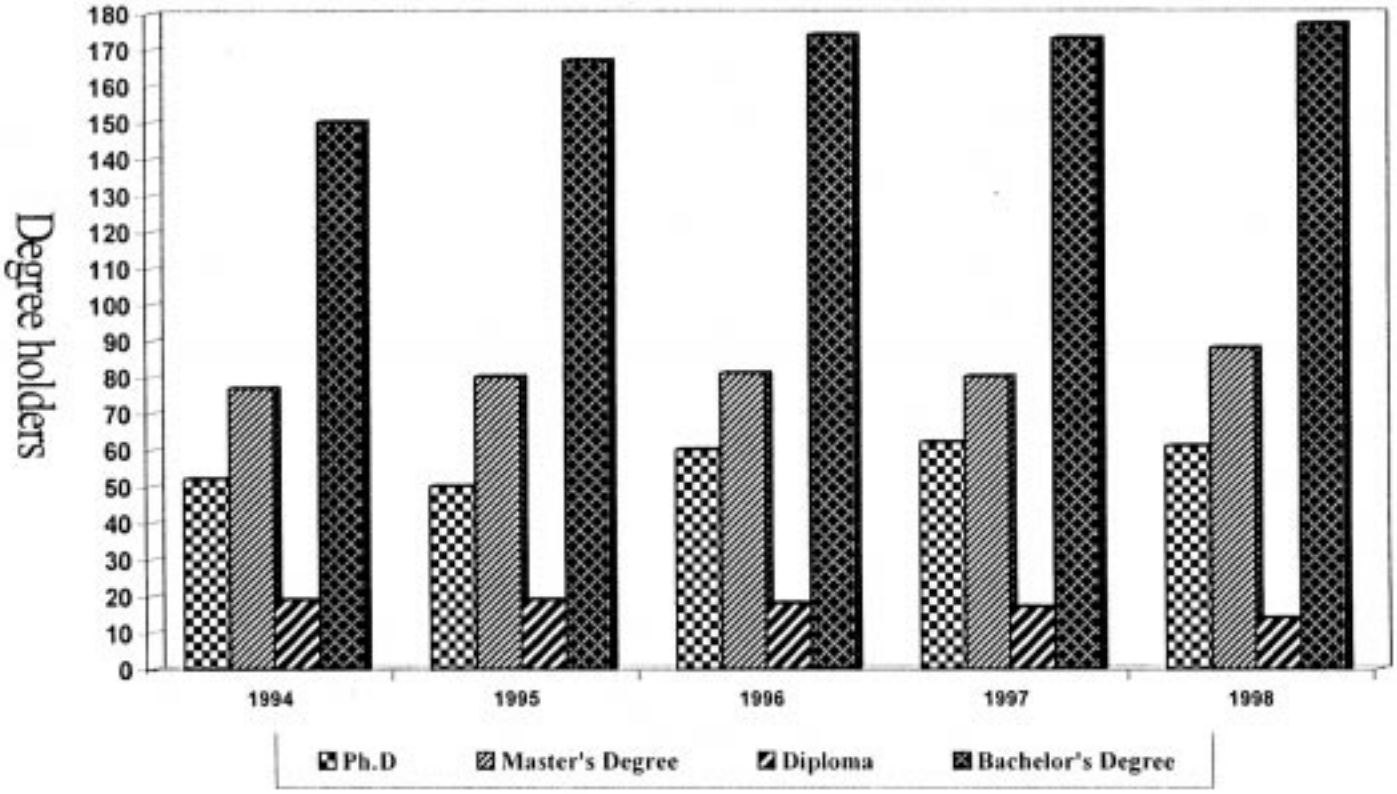
1. Dr. Said Alloush
   President
2. Dr. Seyfeddin Muaz
   Vice President
3. Mr. Samir Abu-Ajwah
   Director of the Financial Audit and Communications Department
4. Mr. Hassan Khadra
   Director of the Quality Assurance Department
5. Mr. Kamal Khatib
   Director of the Financial Department
6. Mr. Sa'id Ghaleb Hassan
   Director of the Electronic Services and Training Centre
7. Dr. Saqer Abdel-Rahim
   Director of the Computer Technology, Training and Industrial Studies Centre
8. Mr. Malek Kabariti
   Director of the Renewable Energy Research Centre
9. Mr. Ayman Al-Hassan
   Director of the Environmental Research Centre
10. Dr. Naseem Haddad
    Director of the Mechanical Design and Technology Centre
11. Dr. Khalid Kahhaleh
    Director of the Building Research Centre
12. Dr. Yaseen Khayyat
    Director of the Industrial Chemistry Centre
13. Mr. Waleed Khasawneh
    Director of the Administrative Department
14. Dr. Mohammad Qasem Qaryuti
    Dean of Princess Sumaya University College for Technology

Employees, their Specializations and Departments/ Centres

Department or Centre	Ph.D	M.A. & M.Sc	Diploma	B.Sc. & B.A	Engineer Grad	Community College	One year after General Secondary	General Secondary	Below Secondary	Total
Computer Technology, Training and Industrial Studies Centre	3	18	3	32	-	16	3	16	6	97
Electronic Services and Training Centre	1	6	3	21	2	9	-	10	20	72
Mechanical Design and Technology Centre	4	8	3	11	-	8	-	1	13	48
Administrative Department	-	1	-	11	-	7	1	16	39	75
President's Office	4	1	-	5	-	1	3	-	4	18
Financial Department	-	1	-	10	-	2	2	3	4	22
Building Research Centre	6	15	1	23	2	10	2	10	20	89
Industrial Chemistry Centre	5	6	2	15	-	10	1	2	5	46
Renewable Energy Research Centre	2	5	-	14	-	5	-	2	4	32
Environmental Research Centre	6	16	-	12	-	5	3	1	2	45
Princess Sumaya University College for Technology	27	8	-	13	-	7	2	3	6	66
Quality Assurance Department	2	2	2	1	-	-	-	-	1	8
Financial Audit and Communications Department	1	1	-	9	-	-	-	4	3	18
Total	61	88	14	177	4	80	17	68	127	636


University Graduate Employees of RSS in 1998
Bachelor's Degree
52%
Ph.D
18%
Diploma
4%
Master's Degree
26%
Ph.D
Master's Degree
Diploma
Bachelor's Degree

Number of RSS Holders of University Degrees in the Period (1994-1998)



BALANCE SHEET
31/12/1998

ASSETS	December 31 1998 JD	December 31 1997 JD	LIABILITIES	December 31 1998 JD	December 31 1997 JD
Current Assets:			Current Liabilities:		
Cash on hand and at banks	1,870,036	1,642,678	Accounts payable	75,299	149,137
Accounts receivable-net	728,195	840,211	Deposits	736,464	571,722
Main store	372,068	408,208	Unearned revenue	-----	273,513
Other assets	521,861	233,240	Current portion of long term loans	160000	383,671
Total Current Assets	3,492,160	3,124,337	Provision of staff indemnities and vacation pay	3,583,275	3,270,518
			Total Current Liabilities	4,555,038	4,648,561
Investment in Equity Securities – net of an allowance of JD 66250 for the decline in market value	240,480	227,980	Long Term Loans	306,667	466,667
Endowment Fund at the Industrial Development Bank	2,411,810	2,411,810			
			FUND BALANCE		
Fixed Assets – at cost			Fund balance – beginning of the year	17,204,990	16,568,672
Land and Improvements	6,908,147	6,908,147	Net surplus for the year	696,809	645,603
Buildings and improvements	5,661,803	4,576,540	Fund balance –End of the year	17,901,799	17,214,275
Machinery, furniture and fixtures	15,775,157	14,854,153			
Total Fixed Assets	28,345,107	26,338,840			
Less: Accumulated depreciation	11,726,053	10,642,516			
Net Book value of Fixed Assets	16,619,054	15,696,324			
Projects in Progress	------	869,052			
TOTAL ASSETS	22,763,504	22,329,503	TOTAL LIABILITIES AND FUND BALANCE	22,763,504	22,329,503

RSS Cooperation Relations with Arab and International Organizations and Institutions

RSS is connected with a good number of Arab and international organizations and institutions through:

a. Agreements or protocols of cooperation with the following institutions:

- The National Institution for Scientific Research/Tunisia.
- Arab League Educational, Cultural and Scientific Organization (ALECSO)/ Tunisia.
- Islamic Foundation for Science, Technology and Development (IFSTAD)/ Saudi Arabia.
- Academy of Scientific Research and Technology/ Egypt.
- King Abdul Aziz City for Science and Technology/ Saudi Arabia.
- Renewable Energy Development Centre (Centre de Developpement des Energies Renouvables)/ Morocco
- Scientific and Technical Research Council of Turkey (TUBITAK)/ Turkey.
- The Academy of Sciences of the Russian Federation/ Russia.
- National Technical Information Service/ USA.
- Council of Scientific and Industrial Research/ India.
- Council of Scientific and Industrial Research/ Pakistan.
- Friedrich Ebert Stiftung/ Germany.
- German Agency for Technical Cooperation (GTZ)/ Germany.
- Cambridge Applied Nutrition, Toxicology and Biosciences Group (CANTAB)/ United Kingdom.
- Polish Academy of Sciences/ Poland.
- Scottish Development Agency/ United Kingdom.
- The Islamic Academy of Sciences/ Jordan.
- Bahrain Centre for Research and Studies/ Bahrain.
- International Development Research Centre (IDRC)/ Canada.
- United Nations Development Programme (UNDP).
- Swiss Federal Laboratories for Materials Testing and Research (EMPA)/ Switzerland.
- Economic and Social Commission for Western Asia (ESCWA).
- Islamic Educational, Scientific and Cultural Organization (ISESCO).
- Centre for Caucasian Affairs Studies/ Grozny, Chechen Republic.
- The Institute for Social and Economic Policy in the Middle East, John F. Kennedy School of Government, Harvard University, Cambridge, Massachusetts/ U.S.A.

- Foundation for Research in Security and National Development Affairs/ Pakistan.
- Arab Union of the Manufacturers of Pharmaceutical and Medical Appliances/ Jordan.
- United Nations Educational, Scientific and Cultural Organization (UNESCO)/ France.
- Council for Scientific and Industrial Research (CSIR)/ South Africa.
- Japan International Cooperation Agency (JICA)/ Japan.
- University of Stuttgart (ITW)/ Germany.
- Ministry of Higher Education and Scientific Research/ Yemen.
- Illinois University/ U.S.A.
- The Royal Society/ United Kingdom.
- Central Metallurgical Research and Development Institute/ Egypt.
- Al-Najah National University/ Palestine.
- The Malaysian Industry Government Group for High Technology (MIGHT)/ Malaysia.
- Harvard University Graduate School of Design (Unit for Housing and Urbanization)/ USA.
- The United Nations University (Institute of Advanced Studies).
- Danish Technological Institute (DTI)/ Denmark.
- Lloyd's Register Quality Assurance LTD./ United Kingdom.
- Reiber Electronic Laser-Optic GmbH/ Germany.
- Norsk Hydro Produksjon a.s./ Norway.
- UNIFEM Western Asia Regional Office.
- Akturk Building Industry and Trading Company/ Turkey.
- SP Swedish National Testing and Research Institute/ Sweden.

b. Membership in the following organizations:

- Federation of Arab Scientific Research Councils/ Iraq.
- World Association of Industrial and Technological Research Organizations (WAITRO)/ Denmark.
- International Council of Scientific Unions (ICSU)/ France.
- International Foundation of Science (IFS)/ Sweden.
- International Association for Housing Science/ U.S.A.
- The International Federation of Institutes for Advanced Studies (IFIAS)/ Canada.
- International Measurement Confederation (IMEKO)/ Hungary.
- UNESCO Regional Office for Science and Technology for the Arab States (ROSTAS)/ Egypt.
- UNESCO Intergovernmental Informatics Programme (IIP)/ France.
- Asian Energy Institute (AEI)/ New Delhi.
- Arab Union for Cement and Building Materials/ Syria.

Main Achievements of RSS *in 1998*

Field of Applied Research and Technical Studies

- **Environment Sector**
- **Building Sector**
- **Energy Sector**
- **Information Technology Sector**
- **Industries:**
  - ***Engineering industries (mechanical, metallic and electrical)***
  - ***Chemical industries***
- **Other Studies and Activities**

- Environment Sector

1. Monitoring water quality of King Abdulla Canal and Zai Water Treatment Plant.
2. Wastewater collection, treatment, disposal and / or reuse system project for the catchment area of Yarmouk river and Jordan river.
3. The national project for studying and monitoring water quality in Jordan.
4. Monitoring water quality in King Talal reservoir.
5. Performance of As-Samra wastewater stabilization ponds and their impact on the groundwater aquifer.
6. Monitoring the performance of industrial wastewater treatment plants.
7. Desalination of brackish water with reverse osmosis supplied by a renewable energy hybrid system.
8. Wastewater treatment and recycling from raw sewage to valuable effluent and energy resource.
9. Reducing environmental impact of wastewater from olive mills of (Jordan).
10. Technology and know-how transfer of treatment of olive mills wastewater to the West Bank.
11. Treatment of industrial wastewater containing heavy metals.
12. Environmental impact assessment for the hydro-agri Jordanian – Norwegian Fertilizer Project.
13. Monitoring of total suspended particulate (TSP) levels in Fusheis.
14. Monitoring of stack emissions in cement factory in Fuheis.
15. Monitoring of ambient gaseous pollutants and (TSP) at Al- Hashimyeh / Zarqa.
16. Monitoring of particulate less than (10 μ), (PM 10) levels in Fuheis.

- Building Sector

1. Computerization of the Jordan National Building Codes.
2. Preparing draft manuals and summary sheets of the Jordan National Building Codes.
3. Preparing drafts of unified building codes for the Arab countries.
4. Second stage of the project on earthquakes hazards evaluation and methods of mitigating their environmental impact.
5. Study of the devaluation and retrofitting of the primary industrial structures.
6. Study of the repair and strengthening of the observation tower of the Ports Corporation to improve the tower's performance under future earthquake loading.
7. The nature and causes of damage to epoxy mortar used at Kafrain dam.
8. Research study entitled extending the life span of industrial structures.

9. Using of phosphogypsum to produce gypsum cement pozzolana binders.
10. Building Repair and Maintenance Sector in Jordan.
11. Old Jerusalem Documentation Project.
12. Builder-Owner's Manual.
13. The Development of Light-Weight Thermal Insulating Concrete (MAL System).

- Energy Sector

1. Wastewater recycling supplied by renewable energies in the Near East.
2. Middle East zone solar project (Jordan).
3. Desalination of sea water using renewable energy.
4. Developing electric wind energy converters (WEC)
5. Finalizing the solar thermal refrigerator project.
6. The Jordanian- German rational use of energy project.

- Information Technology Sector

1. Universal Networking Language project (UNL)
2. Cultural Journeys in the Information Society "INCO Project"
3. Textile Application of High Performance Computing in the Middle East (THEME)

- Industries:

- ***Engineering industries (mechanical, metallic and electrical)***

1. Minimizing the corrosion problems in Jordanian food canning industry "spotting phenomenon" in the internal layer of lacquer.
2. Implementation of heat treatment technology in designing and manufacturing of spare parts in Jordan.
3. Manufacturing of clinker cooling grate plate (Iron-chromium nickel alloys) for Jordan Cement Factory.
4. Establishing a data base for foundry sector in Jordan
5. Designing and manufacturing of a radiation measuring equipment's calibration bench.
6. Designing and manufacturing five ultrasonic liquid level meters sponsored by the Higher Council for Science and Technology for the benefit of a private electronics firm.
7. Designing a computerized data acquisition system using "LabVIEW" graphic language software package to measure, record and analyze the activities and responses of living cells for the advantage of the biology department at the University of Jordan. The system comprises a driving software, hardware, a signal isolation unit and a power supply for feeding transducers.

8. Designing a high precision current source (1mA, ±0.5%) to drive transducers used in the renewable energy field.
9. Manufacturing a reproducible infant incubator that has been designed previously with the support of the Higher Council for Science and Technology and in collaboration with the Ministry of Health. Two more prototypes are being built to be delivered to the Ministry of Health for testing purposes.
10. Manufacturing (50) audio amplifier units, models (S240) and (S280) for use in schools, mosques and other organizations in the Kingdom.
11. Manufacturing of (13) laboratory function generators designed by RSS for the Civil Aviation Authority.

- ***Chemical industries***

1. Safe use of pesticides project.
2. Aerosols manufacturing development project.
3. Agricultural pesticides formulations development project.
4. Glass sand evaluation project.
5. The bentonite project.

- Other Studies and Activities

In addition, RSS conducted the following socio-economic studies:

- Poverty and unemployment in Jordan.
- Human resource development in Jordan.
- A feasibility study of "establishing a desalination project in Qatar village / Aqaba Governorate."
- A comparative study of establishing a housing city for Shidia mining.
- Socio-economic impact of the development and employment fund loans/ beneficiary perspective.
- Socio-economic condition and land settlement at Shidia / Aqaba Governorate.
- Enhancing maintenance sector at the food processing industries.
- Proposed project to establish industrial estates.
- Obstacles facing exporters to Israel and the Palestinian National Authority.
- Feasibility study to establish a V-belts factory.
- Wastewater from olive mills: Reducing environmental impacts (Jordan).
- Feasibility study to establish employing institute.

RSS also participated in many workshops and local and international conferences.

Field of Technical Consultations and Services

- **Environment Sector**
- **Building Sector**
- **Energy Sector**
- **Information Technology Sector**
- **Industries:**
  - ***Engineering industries (mechanical, metallic and electrical)***
  - ***Chemical industries***
  - ***Plastic and rubber industries***
- **Other Services**

- Environment Sector

- (150) technical consultations for local and foreign companies and institutions.
- (33000) laboratory tests on water samples.
- (85) laboratory tests on food samples.
- (45) laboratory tests on antiseptics and disinfectants.
- (55) laboratory tests on detergents.
- (950) qualitative and quantitative analysis of radionuclide contamination in food stuffs.
- (6200) tests on accumulative doses received by (1550) workers in the fields of application of radiation and radioisotopes.
- Equipping a calibration laboratory for portable radiation dose/dose rate meter.
- Performing radiation dose measurements, and measurement of radionuclide content in Phosphogypsum – Hydro – Agri fertilizer plant project site, Shidia.
- (26) tests on environmental samples for radionudile contamination in collaboration with MEMR.

RSS participated in the provision of technical consultations through the following committees:

- Radiation protection commission.
- Ionizing radiation permanent licensing committee.

- Building Sector

- Continuing providing consulting services according to the agreement signed with the National Telecommunications Company for supervising the construction of the second phase of buildings for the National Communications Program.
- Supervising the construction of phase II of renovation of the Salt secondary school for the Ministry of Education.
- Supervising the construction of six schools for the Ministry of Education with a total area of (24000) m2.
- Designing and preparing drawings and tender documents for Ma'an Industrial Estate.
- Designing and preparing drawings and tender documents for the new extension to Al-Hasan Industrial Estate/ Ramtha.
- Study for the restoration and maintenance of Karak secondary school for boys.
- Designing and preparing drawings and tender documents for the extension of Salt secondary school for boys.

- Designing and preparing working drawings and tender documents for furnishing and equipping Princess Sumaya University College for Technology (PSUCT)'s new computer and administration building.
- Designing a housing project for the Jordan Phosphate Mines Company in Shidia.

In addition, RSS performed many structural designs and structural design checks for several engineering structures as follows:

- Structural evaluation of the spectators stadium within Ramtha Sport Complex.
- Repair of the services building within Karak sport complex.
- Structural strengthening of part of Ramtha secondary school for boys.
- Stabilizing and strengthening building (B5-68) within Abu - Nusair housing.
- Gabion and reinforced concrete retaining walls behind the Telecommunication Corporation building in Tafila.
- Structural design check of the suits factory hangar in Al-Hassan Industrial Estate, with a total plan area of about (8500)m^2.
- Structural design check of the modern housing project (research project).

RSS also provided laboratory testing, services and calibration as follows:

- -(310) laboratory tests on building stones.
- (160) laboratory tests on kerb stones.
- (200) laboratory tests on concrete blocks.
- (3500) laboratory tests on concrete pipes.
- (5) loading tests.
- (5) laboratory tests on wood poles.
- (270) laboratory tests on aggregates and base course.
- (112) laboratory tests on glass materials.
- (4) laboratory tests on wood.
- (1881) laboratory tests on ceramic tiles.
- (320) laboratory tests on ceramic fittings.
- (60) concrete mixes were designed and tested.
- (3500) laboratory tests on concrete.
- (465) laboratory tests on cement.
- (12) laboratory tests on clay roofing tiles.
- (450) laboratory tests on concrete and terrazzo tiles.
- (16) laboratory tests on local and imported gypsum.
- (23) laboratory tests on thermal insulation materials.
- (510) laboratory and field soil tests.
- (110) soil laboratory reports.
- (13) site investigation reports.
- (5028) meters of bore holes were drilled for site investigation of buildings.

- (250) electrical resistivity measurements.
- (161) laboratory tests on hot bituminous mix.
- (56) laboratory tests on ceramic pavement markers.

- Energy Sector

- Project for the utilization of solar energy in the Madaba productive forest camp, for lighting the buildings of the camp using photovoltaic technology to produce electricity and utilizing solar collectors for water heating. This project was executed and handed over in April, 1998.
- Project for utilizing solar energy in Faynan camp in Wadi Araba. Photovoltaics were used to produce electricity and solar collectors were used to heat water.
- Eldorado project for water pumping from desert wells powered by photovoltaics benefiting the Water Authority of Jordan. This project is composed of (7) pumping stations. The German government is funding 70% of the project while the Water Authority bears the other 30% along with the preparation of the infrastructure. The equipment and components of the systems have been purchased and delivered, and RSS is in the process of installing them. It should also be mentioned that the number of PV pumping stations after installation will reach (23), pumping an average of (1700) m^3 per day from wells ranging from (20) m to (130) m deep.
- Signing several agreements with public and private institutions to provide technical and maintenance services:
- Agreement with the Water Authority of Jordan for the maintenance of water pumps facilities in desert wells using mechanical windmills.
- Agreement with the Water Authority of Jordan for the maintenance of water pumps facilities in desert wells using solar energy.
- Providing technical consultations for photovoltaic projects installed in Wadi Araba for the Ministry of Health, Ministry of Education, Civil Aviation Authority, and the Arab Potash Company.
- Providing maintenance services to the solar cell projects for the National Telecommunications Company which were installed in 1995.
- Providing technical consultations in the field of exploiting solar energy for water pumping in desert wells for the Water Authority of Jordan.
- Designing and installing solar cells for lighting purposes to be used in police stations located in remote areas (Al Matwi, Annazah, Bayer, Mafrazah Bayer, Mashash Hudroj, Al Ainab). The number of police stations that have been electrified by solar energy is (19). They are located on the borders of Saudi Arabia, Iraq, and Syria.
- Agreement with Jordan Armed Forces to develop wind energy system for use in remote areas.

- A technical consultation and services agreement with the private sector to develop and manufacture different gear boxes financed by the Higher Council for Science and Technology.
- Domestic solar water heaters were tested through agreements with local industries.
- Many thermal performance tests were conducted for local and imported radiators.
- Thermal performance tests were conducted for heating boilers.
- Solar water heating systems were installed at many locations in the Kingdom.
- Establishing the laboratory for testing central heating boilers.
- Preparations for launching desalination of sea water using renewable energy in Aqaba are underway.
- Providing technical consultations in the field of thermal systems for the private sector.
- Conducting three detailed energy audits at local industries. The purpose of these studies is to explore opportunities for saving all forms of energy. These studies present specific recommendations for the conserving and the rational use of energy at the plant.
- Conducting (15) preliminary studies at local industries in different sectors like the plastic, ceramic, food, and chemical sectors. These studies involve taking a tour of the plant and performing some preliminary measurements to assess the current situation of the plant and to estimate the energy saving potential. The studies have shown that a 5% - 20% saving potential is possible.
- Five performance tests of boilers and efficiency tests for energy saving devices were also performed. In addition, an airflow test for a fan at a mushroom farm was carried out.

- Information Technology Sector

1. Year 2000 Crisis

The following counter measures have been taken to help the private and public sectors find solution prior to the year 2000 arrival:

- Forming a technical committee to solve the automated systems at RSS and the organizations that RSS cooperates with.
- Participating in setting up a comprehensive plan to provide technical assistance to the concerned parties, such as the Department of Income Tax and others.
- Cooperating and participating in seminars and symposiums through presenting technical papers regarding the subject matter at the local and regional level.

- Contributing through technical committees at the national level to set up policies and strategies prior to the arrival of year 2000.

2. Preparing technical specifications for computers hardware and software.
3. Participating through technical committees in assessing over (100) tenders for the private and public sectors.
4. The following governmental offices have benefited from RSS services:

   - The Prime Ministry
   - Ministry of Transportation
   - Ministry of Agriculture
   - Ministry of the Interior
   - Ministry of Public Works and Housing
   - Civil Service Consumer Corporation
   - Civil Registration and Passport Department
   - Military Retirement Establishment
   - Palestinian Affairs Department
   - Industrial Estates Corporation

5. Systems Development

   Due to the advancement of RSS services in systems development, increased number of customers have applied to follow up their existing systems or to develop new ones. Following is a list of RSS customers:

   - The Prime Ministry
   - Ministry of the Interior
   - Ministry of Finance
   - Ministry of Health and Health Care
   - Ministry of Agriculture
   - Ministry of Transportation
   - Ministry of Water and Irrigation
   - National Telecommunications Corporation
   - Civil Service Consumer Corporation
   - RSS centres and departments
   - UNIFEM
   - Jordan Safi Salt Company
   - Red Crescent Hospital
   - National Aid Fund

   Administrative systems developed and followed up are:

   - Personnel Affairs
   - Financing
   - Budgeting
   - Accounting
   - Commercial

- Library
- University Registration
- Maintenance
- Transportation (at three levels)
- Home Pages.

6. Information Services

Over (200) searches were conducted by using the databanks which consist of over (150) databases via DIALOG, and the text books were increased at the library by (3000) books to help professors and students in researches, mainly in the field of science.

7. Computers Equipment Maintenance

This activity covers all the microcomputers acquired at the RSS, including Princess Sumaya University College for Technology. The total number of PC's at the RSS is about (500). In addition assembling PC's equipment is run too.

- Industries

- ***Engineering industries (mechanical, metallic and electrical)***

- Vibration measurements for water pumps.
- (3549) tests on imported and locally manufactured metallic materials such as reinforced steel bars, steel mesh, steel pipes, radiators, castings (manholes, pipes and valves... etc.), steel plates, steel screws, steel wires, copper and steel valves, copper water taps, radiator for motor cars, I-beams, aluminum windows and portable fire extinguisher.
- (685) laboratory tests to identify the mechanical properties (hardness), chemical composition using the micro-analysis detector (EDX), microstructure and heat treatment metallic materials and to verify their compliance with national and international standards.
- (1500) tests of measuring the dimensions, weights and thickness of different materials.
- (13) Holiday inspections of coated pipes.
- Participation in the technical committee for the evaluation of IPC pipe-line.
- Third party inspection for ductile iron pipes produced by Biwater/Britain.
- (25) welding procedure qualification operations for various projects in Jordan.
- (45) welder qualification tests for different welding positions and materials.
- (10) technical consultations in the field of welding works for the public and private sectors.
- (8) technical consultations in the fields of fracture and corrosion analysis.

- Manufacturing of (12) load cells for Jordan Phosphate Mines Company.
- (2) agreements for quality control of welded steel (black-galvanized) pipes used in the transport of potable water.
- (1) agreement for the quality control of locally-manufactured steel bars used for concrete reinforcement.
- (12) technical consultations in the field of aluminum window manufacturing.
- Designing and manufacturing of different plastic injection metallic molds for local companies.
- Designing and manufacturing of sheet metal forming dies.
- Designing and manufacturing of different rubber molds used in spare parts production for Jordan Armed Forces.
- Manufacturing of spare parts for the production lines of local companies.
- Measurements and inspection of spare parts for the private sector.
- Preparation of technical drawings for different projects such as wind vane.
- Cutting of special alloys using advanced techniques for the private sector.
- Review, auditing and approval of engineering drawings for a garbage container.
- Manufacturing different types of refuse containers used in airplanes A310, A320 for Royal Jordanian.
- Manufacturing of evaporation basin for Weather Forecasting Directorate.
- Manufacturing all the required facilities needed for boilers performance laboratory at RSS.
- Manufacturing of wooden furniture facilities for different laboratories at RSS.
- Manufacturing of different spare parts for RSS centers.
- Design and manufacturing of medical paper punching die for the private sector.
- Design and manufacturing of the wooden pattern plates for cooling clinker.
- Manufacturing of wooden pattern for the Dome of the Rock.
- Design and manufacturing of oil quenching tank.
- Design and manufacturing of an apparatus for dental implants research for a local dentist who was awarded first place for outstanding Prosthodontics research from the American College of Prosthodontists.
- (1) agreement for non - destructive testing of locally manufactured steam boilers.
- (1) technical consultation in the field of non-destructive testing technologies.
- (1750) non-destructive quality control tests on welded joints in pipes, tanks, casting and steel plates.
- (3) tests for detecting leakage in underground hot water pipes.
- Supervision and quality control testing of welded pipes, King Abdullah Hospital – Irbid.

- Supervision and quality control testing for reclamation and repairs of Rum Dragline at Al – Hassa Jordan Phosphate Mines Company.
- Quality control testing for Jordan Petroleum Refinery Company during shutdown of certain units.
- Attaining international accreditation for the standards and calibration laboratory for electrical quantities from the German Metrology Institute (PTB) for calibrating DC measuring equipment.
- Calibration and maintenance of more than (1200) electronic measuring equipment for public institutions and private firms.
- Calibration and repair of laboratory equipment at the various technical centers of RSS.
- (3950) samples of electrical products were tested for compliance with Jordanian or international standards with special emphasis on safety testing, due to recently acquired safety testing equipment.
- Provision of technical consultations for local manufacturing companies in areas of product quality improvement.
- Participation in technical committees formed by the General Supplies Department to study offers for supplying electrical products to the Ministry of Health and other public institutions.
- Carrying out a 5-year contract with the Ministry of Health on the maintenance of medical equipment which covers about (15000) medical devices distributed in 23 hospitals and more than (500) health centers.
- Cooperation with the Ministry of Health in establishing repair workshops in four additional hospitals.
- Participation in technical committees for preparing tenders and evaluation offers of medical equipment to be purchased by the Ministry of Health.

- ***Chemical industries***

- (13400) tests on different types of paints and raw materials used in manufacturing paints.
- (4800) tests on mineral oils, lubricants, fuels, anti-freezes, and aircraft engine oils.
- (7100) tests on building materials, soils, phosphate rock, fertilizers, salts, alloys, clinker, and rocks and minerals.
- (1460) tests on paper, textiles, carpets, and baby towels.
- (550) tests on vegetable oils, pesticides, organic solvents, disinfectants, and alcoholic drinks.
- (1981) tests on different foodstuffs.
- (170) tests on different beans and animal feed.

RSS continued to offer the following technical consultations in the fields of:

- Vegetable oils, lubricants, anti-freezes, fuels, and asphalt.

- Paints, detergents and disinfectants.
- Issuing certificates for materials in air cargo and the dangers of transporting these materials by planes.
- Testing air cargo parcels and their contents.
- Studying samples for export: soap, glycerin, table salt, and industrial salt.
- Chemicals and raw materials used in the pharmaceutical industry in order to know their composition and uses.

RSS has also signed the following contracts with industrial enterprises:

- One contract in the field of foodstuffs.
- (10) contracts in the field of paper and textiles.
- (31) contracts in the field of paints.
- (5) contracts in the field of mineral oils.
- (2) contracts in the field of insecticides.
- (8) contracts for the Inorganic laboratory.
- (2) contracts in the field of medical and industrial gases.

- Specialized Cigarettes Testing Laboratory

A specialized laboratory for testing cigarettes was established during this year due to the importance of cigarettes production control in Jordan and of testing the imported cigarettes. The laboratory houses all the equipment necessary for testing all cigarettes' properties and for analysis according to Jordanian and International standards. On October 1st, 1998 the laboratory started to offer technical consultations and services to local companies producing and importing cigarettes..

- ***Plastic and rubber industries***

- (1700) tests on various plastic and rubber products such as films, sacks, pipes, hoses, sealing rings, lining materials, artificial sponge.
- One agreement to monitor the quality of locally produced plastic pipes for potable water transport to be used by the Water Authority.
- One agreement to check the quality of locally produced PVC pipes.

- **Other Services**

- One agreement to supervise the production and determine the quality of drop wires and jumper wires to be used by the National Telecommunications Corporation.
- One technical consultation to asses the extent of damage of a burnt store for plastic products.

Field of Standards and Specifications

- **Environment Sector**
- **Building Sector**
- **Energy Sector**
- **Industries:**
  - ***Engineering industries (mechanical, metallic and electrical)***
  - ***Chemical industries***
  - ***Plastic and rubber industries***
- **Other Activities**

- Environment Sector

RSS participated this year, together with other concerned parties, in drafting and modifying various environmental standards and specifications through the following committees:

- Technical committee for studying and assessing national environmental specifications supervised by the Higher Council for Science and Technology.
- Technical committee for modifying detergents standard.
- National technical committees for setting standards and specifications for ambient air quality.

RSS also participated in setting standard specifications for emitted gases from chimneys in cooperation with various parties from both the public and private sectors.

- Building Sector

- Quality control of local building materials in cooperation with the Institution for Standards and Metrology(JISM).

Through the agreement of cooperation between JISM and RSS for quality control of local building materials, tests were performed at RSS laboratories on samples collected from local factories as follows:

- (1600) laboratory tests on concrete and terrazzo tiles.
- (30) laboratory tests on concrete pipes.
- (1000) laboratory tests on concrete blocks.
- (300) laboratory tests on marble.
- (140) laboratory tests on ceramic tiles.

RSS also participated in the editing and reviewing committees for the following Parts of the Jordanian standard for ceramic floor and wall tiles:

- Jordanian Standard (JS 27/98) "Sanitary Appliances: Specification for Quality of Vitreous China Sanitary Appliances".
- Jordanian Standard (JS.../98) "Sanitary Appliances: Bidets. Part 1: Pedestal bidets over rim supply only. Connecting dimension".
- Jordanian Standard (JS.../98) "Sanitary Appliance Bidets. Part2: wall hung bidets over rim supply only. Connecting dimensions".
- Jordanian Standard (JS.../98) "Sanitary Appliances: Bidets. Part 3: Vitreous bidets over rim supply only, quality, workmanship and functional dimensions other than connecting dimensions".
- Jordanian Standard (JS.../98) "Sanitary Appliances: Specification for flake graphite cast iron".

- Jordanian Standard (JS.../98) "Sanitary Appliances: Specification for baths made from porcelain enameled cast iron".
- Jordanian Standard (JS.../98) "Sanitary Appliances: Specification for baths made from vitreous enameled sheet steel".
- Jordanian Standard (J.S. 1192/98); Asphalt Saturated Burlap Jute.
- Jordanian Standard (J.S .../98); Asphalt Saturated Glass Fiber Sheets.
- Jordanian Standard (J.S.../98); Guide for Testing Waterproofing Horizontal Roofing.

- **Energy Sector**

- RSS and JISM are still working together to implement a Jordanian standard for testing the thermal performance of central heating radiators and boilers.
- Cooperation with JISM and other concerned parties in regard to consider an international accredited standard for solar water heaters so as to comply with it.
- A building was constructed to house the laboratories for testing central heating boilers and radiators

- Industries:

- ***Engineering industries (mechanical, metallic and electrical)***

- Participation in amending the Jordan standard specifications Nos. 519/1987, and JS 520/1987 for aluminum cooking utensils.
- Participation in amending of the Jordan standard specifications Nos. JS 215/1981 and JS 216/1981 for kerosene stoves.
- Participation in amending the Jordan standard specification for cold-drawn steel wires used for reinforcement of concrete.
- Participation in drafting the Jordanian standard specification of steel lathing for plastering.
- Participation in preparing and amending Jordanian standard specifications in cooperation with JISM for the following products:
  - Kitchen electrical appliances.
  - Ballasts for fluorescent lamps.
  - Lead - acid batteries.
  - TV-aerials.
  - Skin and hair care appliances.

- ***Chemical industries***

Thousands of tests were conducted on samples sent by JISM in order to determine their compliance with Jordanian standards and measures:

- (710) tests on paints samples.

- (6300) tests on gases.
- (1618) tests on paper, textiles, carpets, and baby towels.
- (3500) tests on oils.
- (11221) tests on different foodstuffs.

RSS participated in the following committees' meetings on standards:

- Two committees to change the standards for mineral oils and fuels.
- One committee to change the fertilizers standards.
- A permanent committee for food.

In addition, RSS participated in studies for (18) standards regarding detergents, foodstuffs, insecticide, oils, and paints. RSS also participated in tender committees for the Ministry of Information, Ministry of Finance, Ministry of Awkaf and Islamic Affairs, and Public Supplies Department, and in setting specifications of the carpets for Irbid Grand Mosque.

- **Plastic and rubber industries**

- Participation in modification of Jordanian standard No. 535/1987 on plastic bags for shopping.
- Participation in the proposed Jordanian standard on portable waste containers.

- Other Activities

- Preparing the quality manual of the Plastics and Rubber Laboratory, which is the first approved manual for a testing laboratory within RSS.
- Pre-assessment of the Plastics and Rubber Laboratory by a team from JISM and BAM.

Field of Human Resources Development

- **Environment Sector**
- **Building Sector**
- **Energy Sector**
- **Information Technology Sector**
- **Industries:**
  - ***Engineering industries (mechanical, metallic and electrical)***
  - ***Chemical industries***
- **Other Activities**

- Environment Sector

RSS offered training to students from private and public universities on monitoring and assessment of pollutants in different environmental fields. RSS researchers also gave lectures at several schools and received groups of students who were briefed on environmental issues to raise their environmental awareness.

In addition, RSS participated in the King Hussein Environmental Management Training Program - financed by the Canadian International Development Agency (CIDA) - whereby two researchers from RSS attended a technical upgrading program in Canada on environmental auditing. The researchers then participated in delivering a training course in Jordan to transfer the obtained know-how to Jordanians from the public and private sectors. Other training courses will take place at RSS and in the West Bank in future.

Moreover, RSS participated in the following activities:

- Course on "Lead Assessor Course". Amman, 7-12 February 1998.
- Course on "Environmental Impact Assessment". Amman, 18-23 April 1998.
- Course on "Environmental Impact Assessment". 18-23 April 1998.
- Course on "Control Charting". Amman, 25April - 6 May 1998.
- Course on "Analysis Using HPLC". Amman, 25 April - 6 May 1998.
- Course on "Hazard Analysis Critical Control Points (HACCP)-Principles & Practical Implementation". 5-6 May 1998.
- Course on "Quality and Safety of Food Additives". Amman, 1-2 June 1998.
- Seminar on "The Treatment of Olive Mills Wastewater". June 3, 1998.
- Course on "Water Desalination". Musqat, 2-7 July 1998.
- Course on "Application of ISO 25". Amman, October 19-24, 1998.
- Course on "State of Environment Report". Amman, October 24-28, 1998.
- Course on "Internal Auditing". Amman, November 11-12, 1998.
- RSS in cooperation with Lloyd's Register Quality Assurance Ltd. held a training course on "Practical Implementation of EMS". 22-24 November 1998.
- Course on "Application of ISO 14000". Amman, 22-24 November 1998.
- Course entitled " Design, Implementation and Management of National Individual Monitoring Service". Germany.
- Course entitled "Industrial Application of Radioisotops". Damascus - Syria.
- Course entitled "Radiation Protection" at the University of Jordan. Amman.

In addition, RSS participated in a number of seminars and symposiums related to major environmental issues in Jordan.

- **Building Sector**

RSS participated in the following activities:

- Workshop on magnitude calibration in the eastern Mediterranean region. Amman, 4-7 May, 1998 (UNESCO).
- The 1998 Middle East GIS user conference. Amman, 6-17 May 1998
- Managing a GIS' seminar. Amman, 18-19 May 1998.
- The second gathering of Arab sculptors, Jerash 17th Festival of Culture and Arts, 23-24 July 1998.
- "Building a team and managing group work" program. Institute of Public Administration. Amman, 1-3 August 1998.
- The first Jordanian city festival. Salt, Jordan, 24-27 August 1998.
- The first introductory workshop for the disaster management training center. Amman, 5-8 September 1998.
- The first architectural conference of Jordan Engineers Association, "Contemporary Arab –Islamic Architecture: The Crisis for Identity". Amman, 7-10 September 1998.
- Workshop on the role of scientific research in low-cost road projects. Amman, 24-26 October 1998.
- Training workshop on "Seismotectonics and seismic hazard assessment in the Eastern Mediterranean countries". Damascus, Syria, 28-30 November 1998.
- Regional workshop on seismic retrofit and upgrading fundamentals. Cairo, 6-9 December1998.
- The fourth annual seminar on the assessment of housing sector. Amman, 16 December 1998.
- A training course on computer applications in structural analysis and design.

- Energy Sector

- A training course in the field of wind energy and its utilization in Jordan, for Jordan Armed Forces personnel.
- Top management seminar held at Amman Chamber of Industry and attended by top managers of Jordanian industry and establishments. The purpose of this seminar was to educate top managers on the energy saving potential that exists in their establishments.
- Two energy conservation in industry courses were organized by RSS aiming at preparing qualified staff that will be able to conduct detailed energy audits at their plants.
- Course on profit increasing through total energy management was organized by RSS with the participation of a German expert, which intended to prepare managerial and technical staff who will be able to follow up on energy saving issues in their plants and reduce the cost of energy.

- Information Technology Sector

1. Short- term training courses:

   Over (50) training courses were conducted for beginners, fresh graduates who lack practical experience, and experienced staff who are seeking to upgrade their knowledge in information technology. Over (400) participants from over (60) organizations benefited from such training courses.

   Following are examples from the afore-mentioned courses:

   - (6) training courses in developing managerial skills using computer were carried out to the Civil Services Consumer Corporation. More than (150) employees participated in these courses, each one of which ran for (6) weeks.
   - A course on developing "Media" managerial skills using computer was offered to more than (40) employees from Jordan News Agency.
   - - A course on technical search by using the Internet was offered to (13) directors from the Ministry of Planning.
   - Summer training was held for students from Princess Sumaya University College for Technology.

2. Long-term training courses:

   Two "system engineering" courses were conducted for a duration of four months each in which (28) computer analysts participated. The first one, at the regional level, was financed by the Japan International Cooperation

Agency (JICA). The second one was directed to local system analysts where (9) establishments of the private and public sectors were represented.

In addition, RSS sent one of its employees to the United Kingdom to get his Master Degree in computer science.

- Industries:

- ***Engineering industries (mechanical, metallic and electrical)***

- Training (25) engineers and technicians from the government and private sectors on welding technology.
- Training (12) participants from the private and public sectors on design and manufacturing of die casting molds in cooperation with the Taiwanese Government.
- Training (12) participants from the private and public sectors on the design and manufacturing of sheet metal forming dies in cooperation with the Taiwanese Government.
- Workshop on "New casting technologies in the world" for participants from the private and public sectors working in casting field.
- Training (20) undergraduate students from the mechanical and industrial engineering departments of the Jordanian universities.
- Training (2) engineers from Yemen Arab Republic.
- Training (3) students from the Vocational Training Corporation.
- Teaching the "Mechanical Workshop Technology Course" at RSS Princess Sumaya University College for Technology.
- Conducting 3-month training course for (10) Palestinian engineers on the maintenance of medical equipment in cooperation with the Japan International Cooperation Agency (JICA).
- Conducting 2-month training course for (10) technicians from the Ministry of Health on maintenance of medical equipment, within the scope of the agreement between the Ministry and RSS.

RSS sent a number of its engineers for training abroad as follows:

- (2) engineers on maintenance of laboratory equipment in Taiwan.
- (1) engineer on maintenance of air pollution measuring equipment in France.
- (2) engineers on maintenance of anesthesia equipment and ventilators in France.
- (1) engineer on maintenance of surgical microscopes in Switzerland.

- ***Chemical industries***

- XRF analysis training course in cooperation with Philips Company in the period 25-29 April 1998. (13) companies and institutions participated in this course.
- Foodstuffs analysis training course in the period 20-24 June 1998.
- Physical and mechanical tests training course on paper and cartoon products in the period 5-9 September 1998. (8) companies and institutions participated in this course.
- Training students from public and private universities on analysis of foodstuffs, chemical and different industrial products.
- A paper on "The Use of Pesticides" was prepared and presented in the Pesticides Seminar organized by the Vocational Training Corporation.

- Other Activities

- Participation in the scientific committee of the first Italian - Jordanian conference held in Amman in the period 16-19 March 1998, and organized by the Higher Council for Science and Technology.
- Participation in a workshop on training needs in the field of water desalination held at the Middle East Desalination Research Center.
- Attending two lectures on exports packing organized by Jordan Export Development Corporation.

Projects Awaiting Financing in 1999

- **Environment Sector**
- **Building Sector**
- **Industries:**
  - ***Engineering industries (mechanical and metallic)***

Projects Awaiting Financing in 1999

- Environment Sector

1. **Studying the water quality of Yarmouk river tributaries**

   This project aims at evaluating the water quality of Yarmouk river tributaries in order to control polluted points. This will minimize negative impacts on the water quality of the Yarmouk river, which eventually feeds the King Abdullah Canal.

   Estimated duration: (36) months.

2. **Residential water conservation and greywater reuse**

   This study aims at determining residential water usage patterns in Greater Amman Area, preparing water conservation guidelines, studying the feasibility of renovation, and reusing greywater and rainwater for appropriate usage.

   Estimated duration: (36) months.

3. **Appraisal of Giardia cysts in Jordanian waters**

   This study aims at monitoring the presence of Giardia cysts in drinking water, surface water and treated wastewater (type and count), as a pre-step for controlling the spread of diseases caused by pathogenic protozoa.

   Estimated duration: (36) months.

4. **Pre-treatment of industrial wastewater at selected Jordanian industries**

   This study aims at determining cost effective wastewater treatment methods for selected Jordanian industries, located at Amman Industrial Estate, Sahab. The project entails identifying pollution prevention and waste minimization potentials for local industries.

   Estimated duration: (36) months.

5. **Monitoring vehicular exhaust emissions in Greater Amman Area**

   This project aims at assessing the contribution of gasoline driven vehicles to air pollution in the Greater Amman Area and identifying the types of vehicles that contribute most to air pollution in Amman, in addition to providing basic information necessary for developing standards for vehicular emissions.

   A representative sample of public and private automobiles will be tested to identify exhaust emissions concentrations. Results will be compared with the manufacturer's specifications as well as international standards.

   Estimated duration: (12) months.

6. **Monitoring of suspended dust resulting from handling and loading of cement in Aqaba city**

This project aims at determining the contribution of cement handling and loading at Aqaba port to dust levels in the city. The results of this study will be compared to those of previous studies so as to assess the degree of success of measures taken to reduce cement dust pollution. Three monitoring stations are expected to be established in the vicinity of cement handling and loading facilities.

Estimated duration: (12) months.

7. **Monitoring of ambient gaseous pollutants and dust in downtown Amman and Russiefa city**

This project aims at determining total suspended particulate (TSP) and inhalable particulate (PM10) in addition to gaseous pollutants including nitrogen oxides, carbon monoxide, hydrocarbons and ozone. Levels of air pollution will be assessed in downtown Amman, nearby Russiefa solid waste dumpsite and nearby Jubilee industrial area in Zarqa.

Estimated duration: (9) months.

8. **Surveying radon gas levels in Jordan and determining mitigation measures**

This project aims at surveying radon gas concentrations so as to identify the high-level areas and to assess the health impacts of exposure to this gas. Appropriate long-term strategies to mitigate these impacts will be identified.

Estimated duration: (3) years

- Building Sector

1. **The effect of high cement content in concrete mixes**

This study aims at developing concrete industry by studying alternatives to obtain good concrete without the need to increase the cement content in the concrete mixes.

Estimated duration: (2) years.

- Industries

- ***Engineering industries (mechanical and metallic)***

1. **Designing and manufacturing of a weigh bridge for trucks of (80) tons capacity**

   This project aims at:
   - Transferring this new technology to Jordan.
   - Developing local manufacturing skills.
   - Saving hard currency which is used to import weigh bridges.

   Estimated duration: (18) months.

2. **Protection of water pumping stations from corrosion in Greater Amman Area**

   This project aims at:
   - Studying the corrosion problems at the water pumping stations in Amman.
   - Suggesting a preventive and periodical maintenance programme to stop corrosion.
   - Selecting the suitable corrosion protection system.
   - Increasing the service life of the pumping stations.

   Estimated duration: (18) months.

The Royal Scientific Society
P.O. Box 1438
Al-Jubaiha 11941, Jordan
Tel. 962-6-5344701
Fax. 962-6-5344806
Tlx. 21276 RAMAH JO
http://www.rss.gov.jo
email: rssinfo@rss.gov.jo

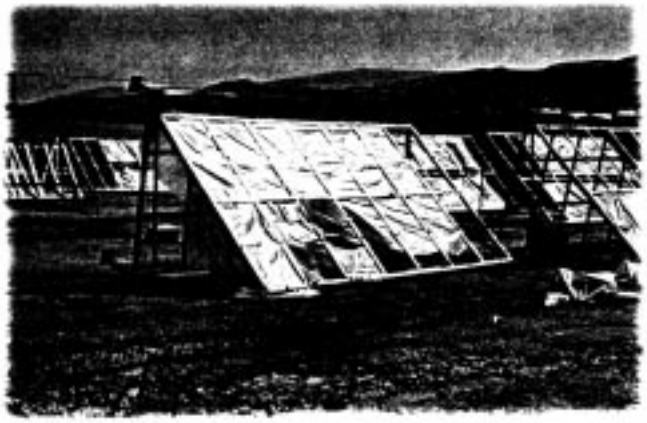
Printed at RSS
AMMAN JORDAN

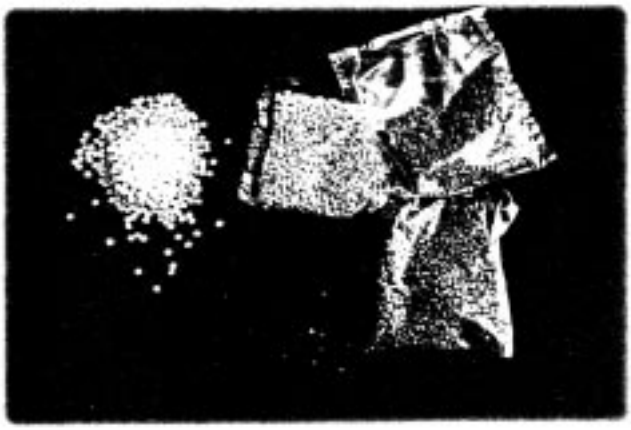
Royal Scientific Society
A National Institution for Research and Industrial Services

الجمعية العلمية الملكية
مؤسسة وطنية للبحوث والخدمات الصناعية

وحدة البلاستيك والمطاط

Plastics & Rubber Facility





The Royal Scientific Society (RSS) is an independent institute aiming at conducting applied research, providing consultancy and technical services, developing human resources and transferring of technology . Among its thirty five specialized laboratories, **the Plastics & Rubber Facility** offers a unique consultancy and testing services for identification, characterization and evaluation of polymeric materials and products available in the Kingdom such as plastic pipes for different applications, fittings and conduits, plastic and rubber hoses, cables and wires, films and sheets for industrial, agricultural and structural applications, plastics sacks, catering boxes, etc. Its activities is not only at a laboratory scale but also extends to field testing and supervision at manufacturing sites to assure the quality of locally manufactured products (for clients who require such services).

The assurance of high quality products is vital for survival and meeting of international competitiveness and quality standards. The testing capabilities of the **Plastics & Rubber Facility,** a unit of the Mechanical Design and Technology Centre at RSS include:

- **Sample preparation** according to the requirements of various international standards. This section is equipped with various cutters, dies, a band saw and a lathe, as well as, controlled temperature chambers to meet the requirements of standards.
- **The testing section** handles a wide variety of routine quality control tests according to international standards. Standard tests that can be conducted are: tensile strength, compressive strength, flexural strength, elongation at break, modulus of elasticity, tear resistance, adhesion strength, shore hardness, falling dart impact resistance, pendulum impact resistance, compression set for rubber, resistance to internal hydraulic pressure, water absorption, heat reversion, dimensions, weight, light transmission, melt flow index, softening point, oxidation temperature and melting temperature. In addition to standard tests, the facility is strongly involved in technical problem solving and insurance-related investigations on the causes of failure of plastic products and the assessment of the extent of deterioration.
- **The processing section** is equipped with: single screw extruder, coextruded multilayered film blowing line, injection moulding machine, thermo - forming machine, and two-roll mill.

Also the Plastics & Rubber Facility performs R & D activities related to protected agriculture, environmental protection by recycling of plastics waste and safety issues on plastic use in food packaging and children toys. Currently, the laboratory is seeking international accreditation. The facility also participates in setting of national standards for plastic products.

The testing services, technical consultations and research activities are performed by trained, highly qualified cadre.

In addition to the Plastics and Rubber Facility, a wide spectrum of technical services is offered by the Mechanical Design and Technology Centre in the following fields:

Mould design and manufacturing, welding technology, mechanical testing of metallic products, assessment of windows performance, chemical and micro-structure analysis of metals, physical measurements, vibration analysis, and manufacture maintenance of load cells.

For more information, please contact :
Royal Scientific Society
Mechanical Design and Technology Centre
Plastics & Rubber Facility
P.O.Box 1438 Jubaiha
Amman 11941 - Jordan
Tel: 962-6-5344701 - Fax: 962-6-5344806

تقوم الجمعيه العلميه الملكيه باعمال البحث والتطوير العلمي والتكنولوجي المرتبطه بعمليه التنميه في الاردن وبتقديم الاستشارات والخدمات الفنيه المتخصصة للمؤسسات العامه والخاصه، وتبرز اهمية **وحدة البلاستيك والمطاط** كأحد المختبرات المتخصصة والمتميزة في الجمعية حيث أن استخدام المواد البلاستكية يتم بشكل موسع في الاردن وخاصة في قطاع الانشاءات ومشاريع البنية التحتيه وفي الزراعة المحمية وفي قطاع التعبئة والتغليف والتطبيقات الطبية وغيرها، مما يتطلب ضمان جودة هذه المنتجات وقد تم تزويد هذه الوحدة بالمعدات والخبرات اللازمة لاختبار وتقييم المواد والمنتجات اللدائنيه المتنوعة مثل الانابيب البلاستيكية لمختلف التطبيقات والوصلات والخراطيم والرفائق والصفائح والكوابل والاغطية الزراعية والاكياس وصناديق نقل الخضار وغيرها. كما تقوم الوحدة بمراقبة جودة المنتجات البلاستيكية سواء كان ذلك داخل المختبر او من خلال الزيارات الميدانيه والاشراف المباشر على خطوط الانتاج. وذلك للتأكد من مطابقة المواد اللدائنيه المستخدمه للمواصفات الدوليه والمحليه المطلوبه .

وتضم وحدة البلاستيك والمطاط المنبثقه عن مركز التصميم والتقنية الميكانيكية عدة اقسام تمكنها من استخدام تشكيلة واسعة من أساليب الاختبار المتعلقة باللدائن .

- **قسم تحضير وتهيئة العينات** والذي يتم فيه اعداد العينات للفحص وفقا للمواصفات القياسيه المعتمده. ويحتوي هذا القسم على الات متنوعه للقص ومنشار ومخرطه وافران وحجرات تبريد، كما يتم تهيئة وفحص العينات عند ظروف محددة من الحراره والرطوبه حسب متطلبات المواصفات والمواد المفحوصة.
- **قسم الفحوصات**، حيث يوفر هذا القسم امكانيه تحديد الخصائص الميكانيكيه والفيزيائيه والحراريه الهامه للمواد اللدائنيه حسب المواصفات العالميه، ومن تلك الخصائص ما يلي: قوة الشد والتمدد، الانضغاط، الانثناء، معامل اللدونه، الاستطاله عند القطع ، مقاومة التمزق ، قوة الالتصاق، الانضغاط للمطاط. مقاومة الانابيب للضغط الداخلي، امتصاص الماء، مقاومة التخزين الحراري ،الابعاد، الوزن، نفاذيه الاغشيه البلاستيكيه للضوء، معامل السيوله، درجة حرارة التلين، مقاومة المواد للاكسده. درجة حرارة الاكسدة ودرجة حرارة الانصهار. وبالاضافه الى ما ورد ذكره من فحوصات قياسية. فان الوحدة تقوم ايضا بحل المشاكل الفنيه التي تواجه الصناعه وكذلك بالتحقق من اسباب التلف ومعاينة الاضرار التي تلحق بالمنتجات البلاستيكيه اثناء النقل او التخزين او بعد التصنيع والقيام باعمال متخصصة لشركات التأمين لبيان اسباب تلف بضائع بلاستيكية وحصر الكميات التالفة .
- **قسم التصنيع والمعالجه** ويضم هذا القسم جهاز بثق وجهاز لتصنيع الاغطيه متعددة الطبقات وجهاز القولبه بالحقن وجهاز التشكيل الحراري وخلاطه ثنائيه الدلفين .

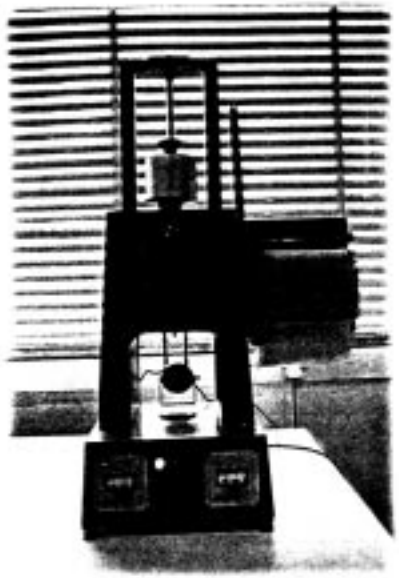
وتقوم الوحدة أيضاً باجراء الابحاث التطبيقيه المتعلقه باستخدامات البلاستيك في الزراعه المحميه والحفاظ على البيئه (تدوير النفايات البلاستيكيه وخاصة نفايات البيوت البلاستيكية الزراعية) وتقييم صلاحيه العبوات البلاستيكية لحفظ المواد الغذائيه والدوائيه. والتحقق من سلامه العاب الاطفال .. الخ. كما تقدم الوحدة الاستشارات الفنيه لتحديد اسباب معالجة المشاكل التي تؤدي الى تدني جودة المنتجات اللدائنيه .

وتسعى الوحدة حاليا للحصول على الاعتماد الدولي. وتساهم الوحدة في وضع المواصفات القياسيه المحليه للمنتوجات اللدائنية المختلفة مثل انابيب نقل مياه الشرب والصرف الصحي والري والخراطيم اللدائنيه والمطاطية والاغطية المستخدمة في الزراعة المحمية والاكياس والخلفات المطاطيه وغيرها .

وينم اجراء جميع النشاطات المذكوره من قبل كادر يتمتع بدرجة عاليه من الكفاءة والتخصصات المختلفه في مجالات اللدائن وفحوصات المواد والابحاث.

وبالاضافة الى وحدة البلاستيك والمطاط ، فان مركز التصميم والتقنية الميكانيكية يقدم طيفا واسعا من الخدمات الفنيه لدعم الصناعه الوطنية في المجالات التاليه : تصميم وتصنيع القوالب، تقنيه اللحام، ضبط جودة المواد والمنتجات المعدنيه (فحص الخصائص الميكانيكية)، تحديد التركيب البلوري والكيمياوي للمعادن، فحوصات اداء الشبابيك، القياسات الفيزيائيه، الاهتزازات الميكانيكية، تصنيع وترميم خلايا الوزن المستخدمه في افشطه النقل والقبانات .

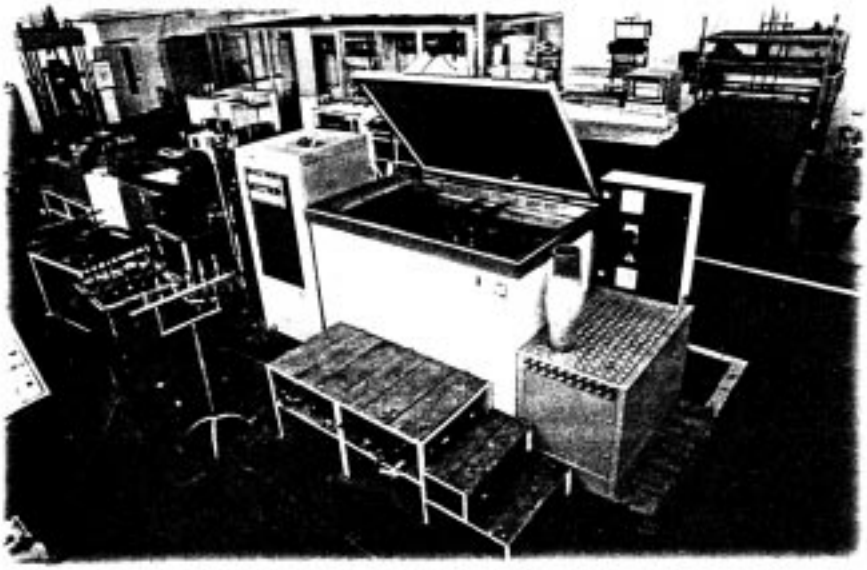
لمزيد من المعلومات يرجى الاتصال بـ
الجمعية العلمية الملكية
مركز التصميم والتقنيه الميكانيكيه / وحدة البلاستيك والمطاط
ص.ب ١٤٣٨ الجبيهه عمان ١١٩٤١ الاردن
للفون : ٠٦-٥٣٤٤٧٠١ - ٩٦٢ - فاكس : ٠٦-٥٣٤٤٨٠٦-٩٦٢



جهاز قياس معامل السيولة
Melt Flow Indexer

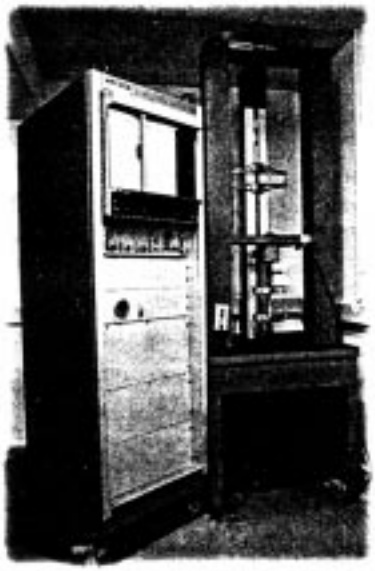
جهاز إختبار مقاومة الصدم
Impact Tester

جهاز قياس الصلادة
Shore Hardness Tester



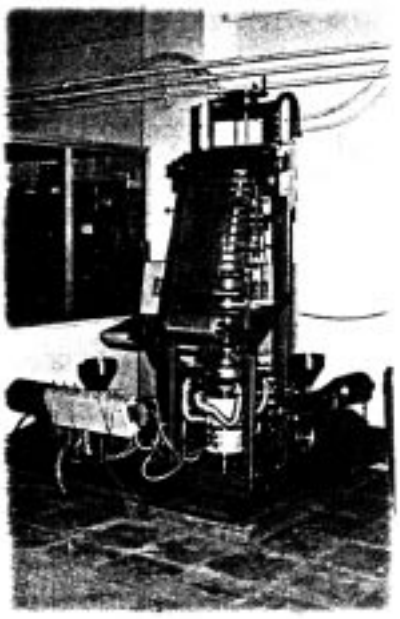
Hydrostatic Internal Pressure Tester

جهاز فحص مقاومة الضغط الداخلي للانابيب

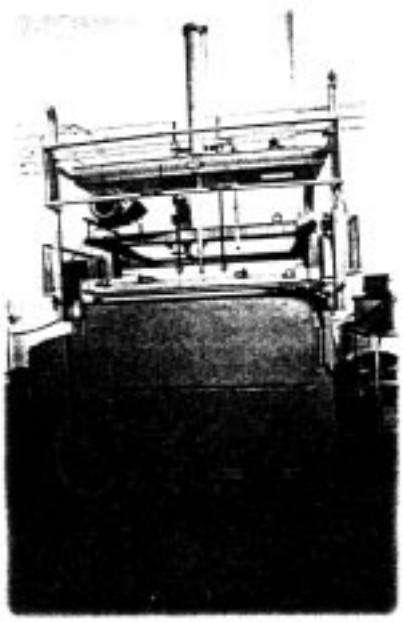


جهاز قياس خصائص الشد والانضغاط
Universal Testing Machine

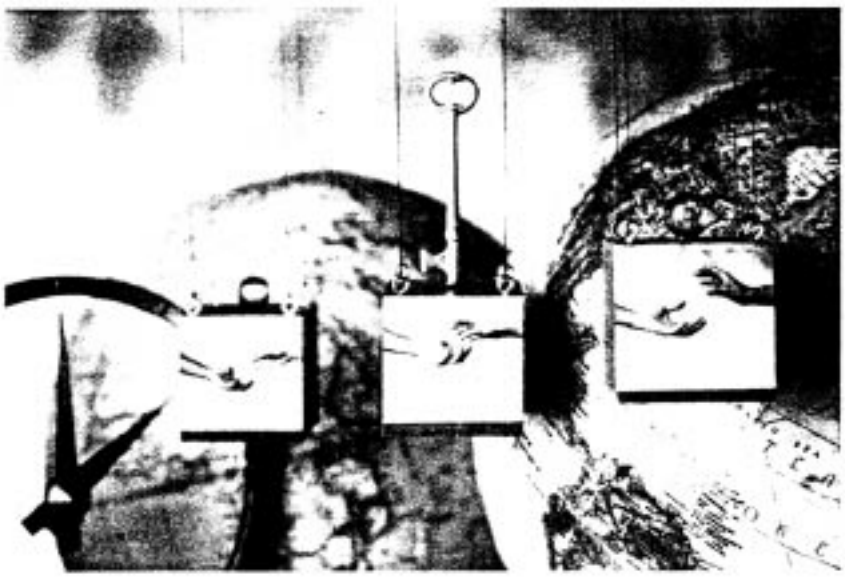
جهاز إختبار الصدم بالوزن الساقط
Falling Dart Impact Tester



جهاز بثق الافلام متعددة الطبقات
Multilayered Film Blowing Line

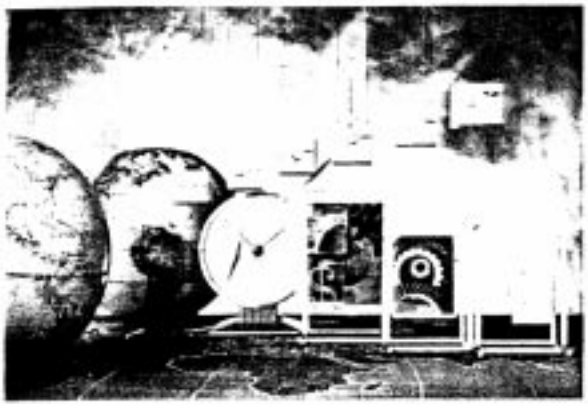


جهاز التشكيل الحراري
Thermoforming Machine



Partners For Prosperity

Jordan United States Business Partnership



Partners For Prosperity

Jordan - United States Business Partnership
(JUSBP)
is a program funded by the United States
Agency for International Development
(USAID) in cooperation with the Jordan
Ministry of Industry and Trade.

Managed by The International Executive
Service Corps (IESC), based in Stamford,
Connecticut, U.S.A.

Who We Are & Why We Are Here

JUSBP is the productivity enhancement program
to improve business competitiveness, employment, and
profitability in Jordan.

1. To provide short-term technical assistance and other support services to small and medium-size enterprises (SMEs). These are manufacturing companies with 5 to 250 employees, and service companies with 5 to 500 employees. The purpose of the technical assistance is to improve firms' productivity, increase their competitiveness and profitability, and provide increased long-term employment prospects for Jordanians.

2. To work with Jordanian Business Support Organizations (BSOs) i.e. "trade associations", in order that they can provide continuing technical assistance, marketing services, ethical and professional standards, and other services to their member firms.

3. To coordinate with the Industrial Development Directorate of the Ministry of Industry and Trade (MTT) in their program of providing additional services to the Jordanian business community, including establishing a National Quality Award program, providing industrial extension, and other assistance.

Partners For Prosperity

JUSBP Components

Firm Level Assistance
We can provide specific technical assistance to firms in many areas. For example: basic corporate strategy, marketing and sales, product design, production, packaging and delivery, corporate finance, customer service, quality assurance and environmental compliance.

We can also help firms establish joint ventures, participate in trade shows, and explore reverse trade opportunities.

Quality and Standards Support
Because quality issues are very important in spurring economic competitiveness within the international market place, we can help improve quality management systems, achieve quality standards certification (ISO 9000, HACPP, FDA, GMP, etc.) and make "Excellence" the hallmark of Jordanian companies.

Business Support Organizations Activity
Through our liaison with Jordanian Business Support Organizations (BSOs) we will be able to help establish productive links to the trade associations most able to provide companies with meaningful services.

Seminars and Training Courses
We arrange for Jordanian and American experts to present seminars and training sessions for personnel.

All activities are provided on a cost sharing basis.

Can We Help You?

Are you a manager or owner of a small or medium size enterprise looking for ways to improve your business?

Could you use help with marketing, upgrading your productivity, exploring nontraditional markets for your products, or using modern office equipment like computers and Internet services?

We want to be your partner in achieving these goals.

Your Success is our Mission

شركاء الازدهار

JORDAN UNITED STATES BUSINESS PARTNERSHIP

■ Jordan United States Business Partnership
(JUSBP)
Suite 500, Qammou Building
30 Prince Shaker Bin Zaid Street
Shmaisani, Amman, Jordan
Tel: (962-6) 568-4308, 566-7639, 566-7640
Fax: (962-6) 568-4266
E-Mail: jusbpotf@globalone.com.jo

SUMMARY STATEMENT REGARDING
THE JORDAN-UNITED STATES BUSINESS PARTNERSHIP

Date: 9 May 1999

The Jordan –United States Business Partnership (JUSBP), is organized as a program operated by the International Executive Service Corps (IESC), which is headquartered in Stamford, Connecticut, USA, funded under a Cooperative Agreement with the United States Agency for International Development (USAID) Mission to the Hashemite Kingdom of Jordan in Amman, Jordan. The Industrial Development Directorate (IDD) of the Ministry of Industry and Trade is JUSBP's counterpart organization.

This program has three main purposes:

1) To provide comprehensive technical assistance, and other consulting services and programs, to Jordanian Small and Medium-sized enterprises (SMEs) which produce goods and services within Jordan. These programs are being offered in order to enhance the firms' productivity and increase their competitiveness and profitability while meaningfully increasing their employment prospects for Jordanians. This concentrates on empowering these companies to compete in international markets and in their own, more open, domestic market with quality products and services;
2) To provide similar assistance services to Jordanian Business Support Organizations (BSOs), i.e. "trade associations", in order that they may, in turn, offer continuing technical assistance, marketing services, ethical and professional standards, and other services to their member firms in order to continue the progress started in 1), above;
3) To provide technical assistance to the IDD at the Jordan Ministry of Industry and Trade in order to improve its services to the Jordan private sector through raising the awareness of the private sector towards a "culture of quality" (TQM), industrial extension programs, computer-based activities and other services.

This four (4) year, US$15 million program commenced on 1 January 1999 and has offices in Amman, Jordan. JUSBP is staffed by two American expatriate managers (Mr. Lewis P. Reade, President & CEO, and Dr. Arun Walvekar, Vice President, Quality & Standards) and a number of Jordanian technical and business personnel. Of special interest is JUSBP's Internship program which will provide meaningful work experiences, combined with on-the-job training for the "World of Work," to young engineering and business graduates in the organization's offices and with client firms and BSOs.

JUSBP maintains a Support Office at IESC Headquarters, with which it is in constant contact, in order to draw much of its technical assistance capabilities from among IESC's 13,000 Volunteer Executives, from U.S.-based consulting firms, and from other training, marketing and professional resources. In addition, JUSBP will be utilizing the capabilities of many Jordanian consulting firms in offering services to local companies, while providing further upgrading of the consulting firms through enhanced programs of training and observation.

Activities of the JUSBP began on 28 February 1999 with a very successful one-week training program in Business Management Skills conducted in cooperation with the newly-formed Jordanian American Business Association. The first American business expert arrived in Amman on March 20, 1999 for a four (4) week assignment.

JUSBP: Telephone (962-6) 568-4308 FAX: (962-6) 568-4266

شركاء الإزدهار

JORDAN - UNITED STATES BUSINESS PARTNERSHIP

Funded by USAID in collaboration with the MIT

1

JUSBP

Jordan-United States Business Partnership

Partners for Prosperity

2

... The Productivity Enhancement Program to Improve Business Competitiveness, Employment, and Profitability

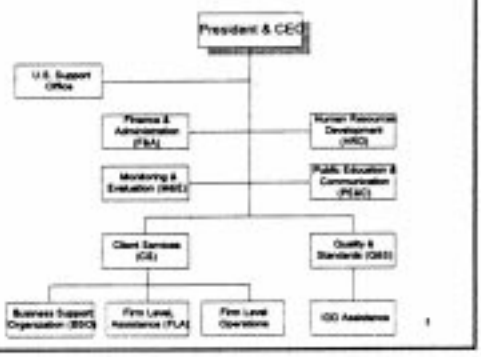
3

JUSBP Objectives

JUSBP has three main purposes :

1. To provide comprehensive technical assistance, and other consulting services, to Jordanian Small- and Medium-size Enterprises (SME).
2. To provide similar assistance services to Jordanian business support organizations (trade associations) in order to strengthen services to member companies.
3. To provide technical assistance to the Industrial Development Directorate (IDD) at the Jordan Ministry of Industry and Trade.

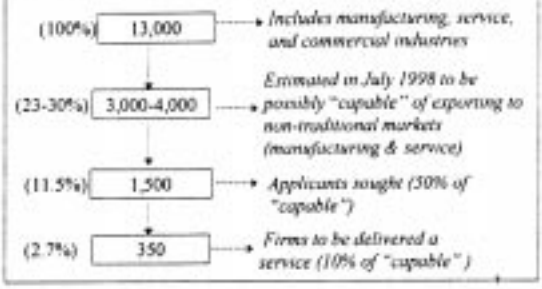
JUSBP Components



Firm Level Assistance (FLA) Objectives

- Build awareness.
- Deliver technical assistance to manufacturing companies of 5 to 250 employees and service companies of 5 to 500 employees.
- Develop technical skills, managerial skills, and outreach capabilities of SMEs.
- Program and monitor Firm Level quality assurance services.
- Strengthen local consulting firms and consultants.
- Develop Internship Program.

Technical Assistance to SMEs



Business Support Organization (BSO) Objectives

Quality & Standards (Q&S) Objective

Provide services to IDD/MIT in order to support them in designing and delivering industrial extension and quality assurance programs.

How JUSBP will provide the assistance?

- JUSBP Team
- Local Consultants
- Voluntary Executives (VEs) from IESC
- U.S. Consultants
- Other International Consultants (only when necessary)

Who Can Benefit from our Services?

- Jordanian small- and medium-size firms
- Existing/operating firms
- Export-oriented firms
- Firms earning or saving foreign currency
- Firms offering employment opportunities

Who Can Benefit from our Services?

- Women-owned/managed businesses
- Industrial sites outside Amman
- Firms utilizing Jordanian natural resources
- Firms seeking to move up the technology scale

We CANNOT Assist

- Firms working under USAID prohibitions
- Registered but not operating firms (startups)
- Industrial firms with more than 250 employees
- Service firms with more than 500 employees

We CANNOT Assist

- Firms undergoing bankruptcy
- Firms not willing to share cost of services
- Firms without a Jordanian majority ownership
- Firms requesting financing for capital equipment or working capital

The Record -FLA

(As of 22 August 1999)

- No. of companies contacted = 2411
- No. of attendees, awareness seminars = 656
- No. of applications = 498
- No. of firms, first visits = 179
- No. of firms, diagnostic visits = 55
- No. of clients, approved for assistance = 50

The Record - FLA (cont'd)

(As of 22 August 1999)

- No. of firms, signed to agreements = 20
- No. of projects under implementation= 18
- No. of firms, completed programs= 2
- No. of firms pending, first visits = 43
- No. of firms pending, diagnostic visits= 39
- Training sessions completed = 4

The Record- BSO

(As of 22 August 1999)

-No. of BSO identified = 18
-No. of BSO contacted = 14
-No. of BSO program planning= 10
-No. of BSO agreements signed= 6
-No. of BSO projects underway= 9
-No. of BSO projects completed = 7
-Training sessions completed = 5

The Record -IDD/MIT

(As of 22 August 1999)

-No. of activities planned = 9
-No. of activities underway = 6
-No. of activities completed = 3
-Personnel assigned to IDD/MIT= 4