

# ジョルダンコンピューター訓練研究センター プロジェクト事前調査団報告書

平成元年10月

国際協力事業団



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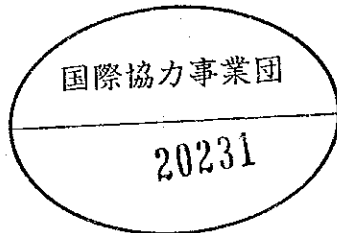
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ジョルダンコンピューター訓練研究センター  
プロジェクト事前調査団報告書

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20231

## 序 文

天然資源に恵まれないジョルダンにおいては、人的資源が唯一の資源であり、その開発の為建国以来教育分野への投資に力を注いでいる。

現在実施中の人材開発5ヶ年計画とも呼ばれている国家開発5ヶ年計画（1986～90年）においてはとりわけ科学技術振興を重点課題としており、1987年にハッサン皇太子を議長とする科学技術高等審議会が設立された。

本プロジェクトは、科学技術高等審議会の具体的な活動の第一弾として1988年7月、我が国に対しプロジェクト方式技術協力として要請されたものである。

我が国はこの要請に応え、1989年8月27日から9月8日まで本件の要請背景、要請内容等を、調査及び確認を行うため、事前調査団を派遣した。

本報告書は事前調査団の現地における調査及び協議事項をとりまとめたものである。

ここに、本調査実施に際し、御協力頂いた在ジョルダン日本大使館をはじめとする日、ジョ両国の関係各位に対して深甚なる謝意を表する次第である。

平成元年10月

国際協力事業団

理事 古 閑 俊 彦





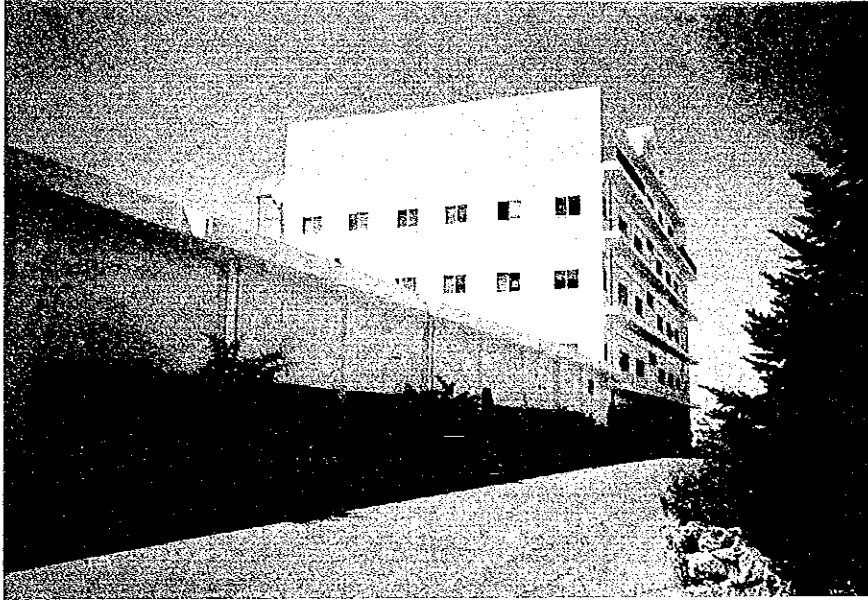


議事録署名（於 科学技術高等審議会）  
左より  
大島団員，長嶋団員，坂田団長，森団員

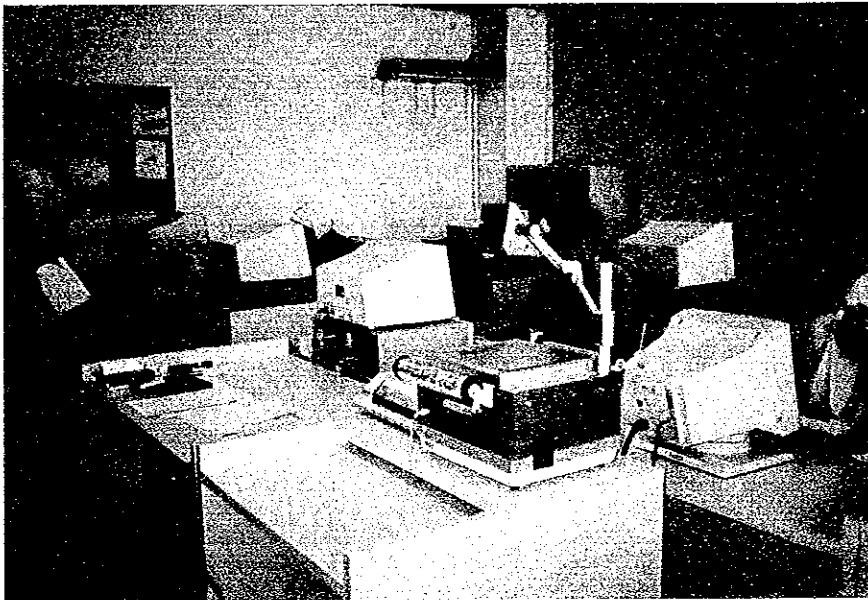


「ジョ」側 左より Dr. Ghassan Mufleh (HCST, 情報技術局長)  
Dr. Abdallah Tukan (HCST, 事務局長)  
Dr. Yusef Nusseir (RSS, 情報システム局長)  
坂田団長  
日本側





プロジェクトサイト (コンピューターソフトウェアセンター建物)



コンピューターソフトウェアセンター内のスマヤカレッジの授業風景



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# I. 事前調査団の派遣

## 1-1 派遣の経緯

天然資源に恵まれない「ジョ」国にとって、人的資源が唯一の資源であり、その開発の為、建国以来教育分野への投資に力を注いできた。しかし現在の沈滞している「ジョ」国の経済を活性化させるためには、各種産業の発展の基礎となる情報化の促進が不可欠であり、これに伴う情報技術者の育成をさらに進める必要がある。

現在実施中の国家開発5ヶ年計画（1986年～90年）は、人材開発5ヶ年計画とも呼ばれており、とりわけ科学技術振興を重点課題として、1987年ハッサン皇太子を議長とする科学技術高等審議会（Higher Council for Science and Technology: HCST）が設立された。

本プロジェクトは、HCSTの具体的な活動の第一弾として計画され、情報処理技術者の育成を図るため、1988年7月にプロジェクト方式技術協力として我が国に対し要請されたものである。

本要請に応え、我が国の当該分野の技術を移転することは、「ジョ」国の今後の経済開発に資すると考えられることから、今回の事前調査団の派遣となったものである。

## 1-2 派遣の目的

要請分野の基礎的なプログラミング技術から、最先端の人工知能に至るまで多岐にわたっており、協力を実施するにあたって、懸念される点も多いことから、要請の背景必要性等の詳細を把握する必要がある。

具体的な調査団の目的は「ジョ」国内における情報処理政策、技術者養成システム、コンピューターの利用状況、ソフトウェア開発状況等を調査し、プロジェクト協力の可能性を検討するとともに、仮に協力する場合プロジェクト方式技術協力としての枠組を整理することにある。

## 1-3 調査団の構成

- |           |             |                         |
|-----------|-------------|-------------------------|
| (1) 坂田 武穂 | (総括)        | 国際協力事業団鉱工業開発協力部調査役      |
| (2) 長嶋 紀孝 | (情報処理)      | 通産省機械情報産業局電子機器課課長補佐     |
| (3) 森 孝   | (データ通信)     | 郵政省電気通信局電波部計画課          |
| (4) 大島 栄作 | (機材計画)      | (財)国際情報化協力センター業務部       |
| (5) 春木 博  | (コンピューター教育) | (財)国際情報化協力センター業務部       |
| (6) 蔵方 宏  | (業務調整)      | 国際協力事業団鉱工業開発協力部鉱工業開発技術課 |

#### 1-4 調査日程

- 8月27日(日) 成田 — バンコク経由  
28日(月) —> アンマン (R J 181)  
29日(火) 計画大臣表敬、大使館との打合せ、科学技術高等審議会 (HCST) との打合せ、サイト視察  
30日(水) HCSTとの打合せ、アラブ銀行コンピューターセンター視察  
31日(木) ジョルダン航空コンピューター視察、ジョルダン電力庁コンピューターセンター視察  
9月1日(金) 資料整理  
2日(土) HCSTとの協議、ジョルダン大学コンピューターセンター視察  
3日(日) HCSTとの協議  
4日(月) 同上  
5日(火) 議事録署名、計画省及び大使館への報告  
6日(水) アンマン —> ロンドン (R J 111)  
7日(木) ロンドン —  
8日(金) —> 成田 (J L 402)

#### 1-5 主要面談者

##### <ジョルダン側>

Dr. Ziad M. Fariz	計画大臣
Dr. Safwan Toukan	計画省 次官
Mr. Nabil Swiss	“ 次官補
Mr. Salem Ghawi	“ 経済技術協力局長
Mr. Mustafa Saleh	“ 二国間協力課長
Mr. Maen AL-Nsour	“ 経済技術協力局
* Dr. Abdallah Tukan	科学技術高等審議会 事務局長
** Dr. Ghassan Mufleh	“ 情報技術局長
Dr. Mazen Armouti	“
** Dr. Yusef Nusseir	王立科学院 (RSS) 情報システム局長
** Dr. Taleb Sarei	ジョルダン大学 コンピューターセンター所長
Mr. Eyad A. Shukairy	アラブ銀行 理事
Mr. Hamdi R. Zarro	“ 情報通信部長
Mr. Hazem F. Kassab	“ ソフト開発部長
Mr. Arwad Abdel-Daem	ジョルダン航空 副総裁



Mr. Ahmad Aburagheb

Mr. F. Anshasi

ジョルダン航空 ソフト開発部

ジョルダン電力庁 情報局長

(注) \* 議事録署名者

\*\* 主な協議相手方

<日 本 側>

在ジョルダン日本大使館

ジョルダン大学

渡 辺 大 使

目 黒 公 使

青 木 一 等 書 記 官

北 崎 二 等 書 記 官

宮 本 JOCV 隊 員

## II. 調査結果の要約

1. 調査団は、本プロジェクトに関する資料及び情報の収集、要請の背景及び内容、プロジェクトサイト、カウンターパート、ローカルコストの確保等、プロジェクト実施の可能性について、「ジョ」側の実施機関であるHCSTをはじめ関係諸機関との間で協議を行なった。  
また、RSS、ジョルダン航空、アラブ銀行、ジョルダン大学等のコンピューター関連施設の視察も併せて実施した。
2. 今回の協議を通じ、双方が理解した事項について、議事録を作成し、署名交換を行った。  
(別添議事録参照)
3. 本件プロジェクトの監督機関であるHCSTは、1987年法律第30号により設立された国家機関で、同法律によりハッサン皇太子を議長とし、他のメンバーは各省大臣等から構成される「ジョ」国における科学技術振興のための、最高意志決定機関である。  
なお、予算については、一般会計予算と自己収入を財源としている。
4. 本センターの施設
  - (1) プロジェクトサイトは、現在コンピューターソフトウェアセンターとして、RSSが所有している建物の一部をあてることとしており、現在改修中である。
  - (2) 広さは十分確保される見込みであるが、我が方より、主要施設につき必要面積を提示し「ジョ」側もこれに基づき検討する旨確認した。
  - (3) 機材設置に係る基礎工事、電源工事等に関する打合せを次期調査団等との間で、行なう必要がある。
5. 本センターの活動
  - (1) センターの機構  
本センターは科学技術高等審議会(HCST)所属の新組織として計画されているが、設立に際しては、王立科学院(RSS)の下部組織となる公算が大きい。現在「ジョ」側にて検討を進めており、近々には結論が出るものと思われる。  
センターは、管理部門である計画課、管理課、実施部門である訓練課、技術開発課及び図書館から構成される予定である。  
(議事録 Annex-2-(1)及び(2)参照)

(2) センターの機能

- i) 「ジョ」国及び周辺アラブ地域の情報技術者を対象とした、訓練、研修
- ii) ソフトウェア開発、AI、ロボティクス、コンピューターアラバイゼーション等の研究開発
- iii) コンピューターによる科学技術のサービス提供

(3) センターで実施する研修コース

- i) 上級プログラマーコース（1クラス、20人×6ヶ月）
- ii) システムエンジニアコース（1クラス、20人×6ヶ月）
- iii) 短期コース、セミナー等

6. プロジェクト協力（我が国の協力範囲）

(1) 調査団は、日本側の協力範囲について、研究開発部門（AI、アラバイゼーション、ロボティクス等）への協力は、そもそもプロジェクト方式技術協力のスキームになじまないこと及び専門家のリクルートが困難であることから協力の対象とはしない旨申し入れ「ジョ」側も了解した。

(2) プロジェクトの目的

- i) 本プロジェクトの目的はカウンターパートの技術移転である。
- ii) 技術移転の項目
  - ・プログラム言語
  - ・オペレーティングシステムの使用法
  - ・データベース及びデータ・コミュニケーション
  - ・システム設計
  - ・プロジェクト・マネジメント

(3) 協力期間 4年ないし5年間

「ジョ」側は、可能な限り短くすることを要望しており、研修コースの開設時期、期間等を考慮すると、4年間とすることも可能と考えられる。協力期間についてはさらに双方で検討した上で次期調査の際、決定することとした。

(4) 協力内容

- i) 専門家派遣
  - ・チーフアドバイザー
  - ・OS、コンピューター言語
  - ・データベース、データ・コミュニケーション
  - ・その他（必要に応じて）
- ii) 機材供与  
機材リスト……………議事録 Annex - 3 参照

iii) 研修生の受け入れ

- ・毎年4名程度を受け入れる。
- ・初年度のみ機材の維持管理の技術者を2～3名別枠にて受け入れる。

7. 「ジョ」側の取るべき措置

「ジョ」側は、調査団が説明したプロジェクト方式技術協力のスキームに理解を示した上で、以下の事項につき「ジョ」側で負担することを確認した。

(1) 建物及び空調、電源等を含めた関連施設の提供

HCSTは、本プロジェクト用の建物、施設については、非公式に議長の内諾を得ており、全く問題は無いとしている。

(2) 人員の確保

HCSTは、総勢44名の人員配置計画を策定しており非公式に議長の内諾を得ている。カウンターパートの技術レベルについては、現RSSのスタッフが中心となる予定であり、特に問題はない。

(3) 予算措置

「ジョ」側の説明によれば、本センターの事業費については、基本的には、独立採算（自己収入見合）制をとることとなる。

プロジェクト実施に際しては、収支見込みに注視する必要がある。

(4) 日本からの調達機材のスムーズな通関手続き。

(5) その他、技術協力協定記載事項の遵守。

### Ⅲ. 要請背景

#### 3-1 要請背景

「ジョ」国には現在アンマンのジョルダン大学、北部イルビットのヤルマック大学及びジョルダン工科大学、南部のモアッタ大学の4つの総合大学があり、各大学にコンピューターサイエンス学部を設けており、4つの大学合わせて毎年約200名の卒業生がある。

ジョルダン大学でのコンピューター教育の内容は、主として欧米の専門書を用いて、ソフトウェア、ハードウェア、アプリケーション等、かなり広範囲にわたる分野をカバーしている。

また、これらの総合大学に加え、全国に57校の単科大学 (Community Colledge) があり、その内の12校が2年間のコンピューター課程を設け、12校合わせ毎年約800名の卒業生を送り出している。

これらの単科大学での教育は、主にパソコンを使用した言語、ソフトウェアの基礎的なものである。

したがって、学校教育としてはかなり熱心にコンピューター教育に取り組んでいるものの、実務者養成という観点からみると、まだ不足している部分が多く「ジョ」国政府としては、今後の「ジョ」国の産業の高度化を進める為には、大学教育における学問的な部分と一般企業の要求するシステム開発、管理技術等の実務的な部分との間のギャップを埋める教育システムの構築が必要であるとして、我が国に対し協力を要請してきたものである。

#### 3-2 コンピューター普及状況

現在「ジョ」国におけるコンピューターの保有台数は、大型から小型まで全て含め約6000台で、主に、政府関係機関及び金融機関で使用されている。

記憶容量別には、640KB～4MBのマイクロ・コンピューター (小型機) が全保有台数の93%を占め、残り4%が1MB～32MBのミニコンピューター及び大型機となっている。

メーカー別のシェアは、次表に示すとおりであるがIBM及びIBM互換機のシェアが全体の80%を占めている。

また全体台数の約96%が輸入であり、残り4%を「ジョ」国内のメーカーが生産している。

なお、国内メーカーは、Jordan Computer Industry社とArab Computer System社の2社で、前者は、シンガポールの企業との合併で主にパソコンを、後者はアラビア語ソフトを中心に生産しており、「ジョ」側の説明によれば一部のソフトを周辺アラブ国へ輸出しているとのことであった。

ジョルダンにおける容量別コンピューター普及状況及び市場シェア

単位：台

Computer Manufactures	Type	Main frame	MINI	MICRO	Total	Market Share (%)
	Memory	2-16MB	1-32MB	640KB- 4MB		
	Storage	.5-5GB	100-500MB	360KB-170MB		
IBM	3		7	300	310	5.184
NCR	3		145	100	248	4.147
DEC	7		53	200	260	4.348
Data General			100	20	120	2.007
Boroghs	2		6	10	18	0.030
WANG			60	60	120	2.007
IBM Comptable				4500	4500	75.263
HP			3	90	93	1.555
Apple				250	250	4.181
Others			10	50	60	1.003
Total	15		384	5580	5979	100.00

95.811% Imported Devices

4.198% Micro Computers assembled locally, components imported.

3-3 情報処理技術者の需要

「ジョ」側の説明によれば、現在の「ジョ」国における情報処理技術者の数はオペレーター、サポーティングスタッフまで含め、およそ2000人であり、今後5年間にさらに6500人、周辺アラブ国の需要も含めると、約29000人を養成する必要があるとのことであった。（職種別内訳は次

表のとおり)

日本側の協力対象分野である上級技術者のみに着目すると、プロジェクト管理者を含め既に、800人がいるが、今後5年間にさらに、600人程度を養成することとなる。

これらの数字については算出根拠が不明ではあるが、今後「ジョ」側の希望する研修コースの拡充等検討する際の一つの目安となろう。

職種別技術者数及び今後5年間の需要予測

単位：人

Job Title	Qualification	Existing	Additional Demand Jordan (Next5years)	Demand Other Arab Contrie (Next5years)
Administrative Jobs	PHD, MSC, B. S. C.	150	100	200
Systems Analysts	PHD, MSC, B. S. C.	150	200	500
Engineers Maintenance(H/W)	MSC, B. S. C.	100	100	300
Programmers	MSC, B. S. C.	500	300	3000
Operators	Diploma School Certificate	250	250	1000
Data Entry and Document Preperation	Diploma School Certificate	300	200	1000
Computer Courses Instructors	PHD, M. S. C., B. S. C.	250	5000	15000
Marketing	M. S. C., B. S. C. Diploma	100	50	100
Support	Hightschool, Diploma, B. S. C.	200	300	1500
Total		2000	6500	22650

## IV. プロジェクト実施計画

今回の協議を通じて調査団と「ジョ」側（科学技術高等審議会）との間で確認されたプロジェクト実施に係る事項は下記のとおりである。

### 4-1 プロジェクトの名称

英語名：The Technical Cooperation for the Project on the Computer Technology Development and Training Center

邦 名：ジョルダンコンピューター訓練研究センター  
とした。

なお、「研究」については、日本側の協力対象とはしないが、本センターの重要な役割の一つであることから、名称の内に挿入することとしたものである。

### 4-2 プロジェクトの実施体制

本プロジェクト運営に関しては、全責任を科学技術高等審議会が負うことを双方で確認した。実施機関は、科学技術高等審議会の下に、本センターが新組織として設立されることであるが、現在「ジョ」側にて具体的な体制を検討中である。

なお、本センター設立に際しては、その主な人材を派遣することとなる王立科学院（RSS）の元に本センターが組織される公算が大きいものと思われる。

### 4-3 プロジェクト協力期間

調査団より、シンガポール、マレーシア等の類似プロジェクトの例を紹介し、通常4～5年間で適当である旨説明した。

これに対し、「ジョ」側より可能な限り短くして欲しいとの要望が出されたが、双方協議の結果、詳細な技術移転計画を作成した上で次期調査の際最終決定することとし、本議事録では、4～5年間という表現にとどめた。

なお、詳細な検討は要するが、研修コース開始時期、研修期間（半年）等を考慮すると4年間で十分な技術移転が行えるものとの印象を得た。

### 4-4 プロジェクト実施場所

本プロジェクトサイトは、王立科学院の敷地内にある「コンピューターソフトウェアセンター」内となる。

本センターに必要な床面積は十分にあることが、現地視察により確認されたが、ターミナルル



ーム、セミナールーム等機能別必要床面積により、若干の改修等が必要となることが予想されるため、調査団より機能別には以下の床面積が必要であることを説明し、「ジョ」側も日本側（案）に基づき今後の改修計画を検討することを約束した。

- (1) セミナールーム（2部屋、100㎡/部屋）
- (2) 実習室（4～6部屋、40㎡/部屋）
- (3) ターミナルルーム（2部屋、100㎡/部屋）
- (4) 専門家執務室（1部屋、40㎡）
- (5) コンピュータールーム（1部屋、140～160㎡）
- (6) デバッグルーム（2部屋、30㎡/部屋）
- (7) その他

#### 4-5 センターの概要

##### 4-5-1 センターの目的

本センターの目的は、「ジョ」国及び他のアラブ周辺国のコンピューター化を促進するため、情報処理技術分野の人的資源を開発することにある。

##### 4-5-2 センターの業務

本センターの業務は、研修コースの開催等の訓練部門とソフト開発の為の研究部門に大別される。「ジョ」側の説明によれば、具体的には以下の活動内容に整理される。

- (1) 「ジョ」国の官民あらゆるレベルの人々を対象とした情報技術研修
- (2) 「ジョ」国及び周辺アラブ国の技術者に対する情報処理技術研修
- (3) 「ジョ」国及び周辺アラブ国のニーズを考慮したソフトの開発及び技術サービスの提供
- (4) ソフト開発、人工知能ソフトのアラビア語化、ロボット化等の分野におけるジョルダン人技術者の能力強化

これに対し調査団より研究開発部門への協力、特に、人工知能、ロボット化については、開発途上の最先端技術であり、専門家のリクルートが困難であること及びソフトのアラビア語化については、我が国には、アラビア語を解する技術者が皆無であろうことから、対応困難である旨説明し、「ジョ」側も了解した。

本センターで実施する具体的な研修コースについては、双方協議した結果以下のとおりとした。

- ・上級プログラマーコース
- ・システムエンジニアコース
- ・その他の短期コース

なお、これらの研修コースの内、日本側は「上級プログラマーコース」及び「システムエンジニアコース」を中心に技術移転を行うこととし、その他短期コースについては基本的には「ジョ」

側が独自に実施するが日本側も協力可能な範囲内で、短期専門家の派遣等により対応することとした。

上級プログラマーコース及びシステムエンジニアコースの具体的な内容は次のとおり。

#### 上級プログラマーコース

〔目 標〕 本コースはチーフプログラマーを養成するためのものである。本コースの狙いはメインフレーム・コンピューター上の応用プログラム開発力を訓練することである。

〔期 間〕 6月間（6時間／日）

〔学習形態〕 講義、計算機実習、事例研究、ソフトウェア開発の総合実習

〔受講資格〕 以下のいずれかの条件を満たすこと。

1. 大学卒業者
2. カレッジのコピューターコース卒業後、2年間の実務経験を有す。

〔定 員〕 20名

〔学習科目〕 1. プログラミング言語  
2. OS、ハードウェアの基礎  
3. OS、TSSの使用法  
4. ホストコンピューターにおけるDB処理プログラム、オンライン処理プログラム  
5. プログラム設計技術およびドキュメント技術  
6. ソフトウェア開発ワークショップ

#### システムエンジニアコース

〔目 標〕 本コースは情報システム開発におけるプロジェクトリーダーとなるべき人のためのものである。本コースの狙いは、システム分析、設計、導入およびシステム開発のプロジェクト管理について訓練することである。

〔期 間〕 6月間（6時間／日）

〔学習形態〕 講義、グループ演習、実習、システム開発の総合実習

〔受講資格〕 以下のいずれかの条件を満たすこと。

1. 大学卒業後3年間のプログラム実務経験を有する。
2. 大学のコンピューター・サイエンス課程を卒業。
3. 本センターの「上級プログラマコース」修了者。

〔定 員〕 20名

〔学習科目〕 1. システム分析  
2. データベース設計と構築  
3. オンラインシステムの設計と構築（LANを含む）  
4. プロジェクト管理体験演習

## 5. システム開発ワークショップ

### 4-5-3 センターの組織

本センターは、科学技術高等審議会に所属する新組織として設立される計画となっているが、現在「ジョ」側にて検討中との説明があった。

関連する組織図は、議事録Annex-2-(1)及び(2)に示す通りである。

センターは、所長の下に、計画課、管理課、研修課、技術開発課の4部門が設置されることになっており、全職員数は44名である。

具体的な職員の配置計画は、以下のとおりである。

所長	1名
計画	5名
図書館	2名
管理	5名
ソフト開発	7名
技術サービス	3名
教員	16名 (カウンターパートとなる)
オペレーター	5名
<hr/>	
計	44名 (全員フルタイム)

### 4-5-4 センター運営予算計画

「ジョ」側より、本センターの運営は、基本的には独立採算（自己収入見合）制をとる旨説明があった。

具体的には、次表に示す予算（案）（収支見込み）に基づき、運営されることとなる。

なお、本予算（案）については、その収入を短期コース及びセミナーに依存しており、やや過大な収益を期待している感があり、実施に際しては、常にその収支に注意を払う必要がある。

センター運営予算 (案)

(単位: ジョルダン・ディナール)

区 分	1 年 目	2 年 目	3 年 目
(支出予算)	330,920	393,280	455,640
変動経費	173,080	235,440	297,800
サラリー給与	145,080	193,440	241,800
電 気 代	8,000	12,000	16,000
消耗品 その他	20,000	30,000	40,000
固定経費	157,840	157,840	157,840
維 持 費	50,000	50,000	50,000
管 理 経 費	64,740	64,740	64,740
旅 費 等	10,000	10,000	10,000
そ の 他	33,100	33,100	33,100
(収入予算)	381,000	568,000	776,000
長期コース収入	21,000	28,000	56,000
短期コース、セミナー及び技術サービス収入	360,000	540,000	720,000
収益 (収入-支出)	29,080	174,720	320,360

## V. プロジェクト協力の基本計画

「ジョ」側は、本件プロジェクト方式技術協力事業について、下記のとおり日本側からの協力を要請した。

### 5-1 技術協力の目的

「ジョ」側が日本側に対し要請する技術協力の目的は、情報処理分野について、日本側から「ジョ」側カウンターパートに対し、本センターで実施する研修コースを運営できるよう、必要な知識及び技術を移転することにある。

### 5-2 技術協力の範囲

本件プロジェクトに関する技術移転の範囲は以下のとおりである。

- (1) プログラミング言語
- (2) オペレーティング・システム利用法
- (3) データベース及びデータ通信
- (4) システム設計
- (5) プロジェクト運営

### 5-3 専門家の派遣

専門家派遣に関し、「ジョ」側は下記のとおり要請した。

- (1) チーフアドバイザー
- (2) オペレーティング・システム及びプログラミング言語専門家
- (3) データベース及びデータ通信専門家

なお、短期専門家は必要に応じ派遣する。

### 5-4 機材供与

機材供与に関し、「ジョ」側は当初より、本センターが研修部門及び研究部門から構成されていることから、各々の部門につきメインフレーム及び周辺機器を1セットずつ計2セットの供与を要請した。

これに対し調査団は、本件プロジェクトに係る機材供与は、プロジェクトの目的、すなわち上級プログラマー及びシステムエンジニアの養成に必要な範囲に限ること、過大な設備は保守管理費用の増大を伴うこと、並びに我が国のODA予算の各プロジェクトへの配分には限度があること等を説明し、「ジョ」側の理解を求めた。

「ジョ」側は、今後の研修コースの拡充に伴い端末機及びその周辺機器の供与を考慮して欲しい旨述べるところがあったが、基本的に調査団の説明を了解した。

なお、「ジョ」側の希望する機材の拡充については、今後のプロジェクトの進捗状況を見きわめた上で、協力期間の後半において必要に応じて考慮する必要がある。

また、機材供与に際しては、ハード及びソフト共に、アラビア語対応のものを日本側は用意できないことを説明し「ジョ」側も了解した。

#### 供与予定機材

機 材 名	数量	備 考
I. ハード関係		
1. 中央処理装置	1台	
2. 主記憶装置	1台	32MB (メガバイト)
3. 磁気ディスク装置	3台	6GB (ギガバイト) 以上
4. 磁気テープ装置	4台	6250/1600BPI (バイト/インチ)
5. ラインプリンター	1台	最小限1000行/分
"	1台	最小限 600行/分
6. パーソナルコンピューター	50台	汎用端末と兼用となる
7. 保守部品	1式	
II. ソフト関係		
1. ソフトウェア (メインフレーム)	1式	オペレーションシステム (UNIX及び他の標準OSを同時使用する)
2. ソフトウェア・マニュアル	2式	
3. 教材	2式	
4. プロジェクト管理研修用教材	8式	

#### 5-5 研修生の受入れ

研修生の受入れに関し、「ジョ」側は、毎年4人程度を受入れて欲しい旨要請した。

また、機材の維持管理技術に関する研修についても、可能であれば上記枠とは別に実施して欲しい旨要請があった。

これに対し日本側は機材の維持管理については、ハードの定期点検、消耗品の取換え及びソフトのバージョンアップ等、機材費の約8~10%程度が必要であることから、通常のハード及びソ

フトの維持管理技術を移転することは、今後の「ジョ」側の運営経費負担の軽減に寄与すると判断し、機材据付前に2～3名の技術者の受入れを別枠にて考慮することとした。

#### 5-6 暫定実施計画

本件プロジェクトの年次別暫定実施計画は、議事録Annex-4に示す通りである。

計画上の主なポイントは以下のとおりである。

- (1) 第1年次は、プロジェクト実施に係る整備期間と位置付け、専門家の受入れ準備、コンピューターの受入れ施設の改善等を行う。
- (2) 第1年次の末に、コンピューターの据付を行う。また、据付に必要な短期専門家派遣も必要に応じて考慮する。
- (3) 第2年次、前半に長期専門家を派遣し、研修コース開設の為の準備、必要な技術の移転及び教材作成等を行う。
- (4) 第2年次後半より研修コースをスタートさせる「ジョ」側の説明によれば、91年9月を開始目標とすることが望ましい。
- (5) 第3年次以降は、研修コースのくり返しとなるが、その都度、カリキュラム、教材等の見直しを行う。

#### 5-7 プロジェクト実施に係るその他了解事項

調査団より以下の事項につき「ジョ」側の責任と費用負担において行わなければならない旨申し入れ「ジョ」側も了解している。

- (1) 空調及び電源装置を含む設備と建物の提供
- (2) プロジェクト実施に必要な機械、装置、器具、工具及びその他の物品の調達、取替え
- (3) 「ジョ」国内における供与機材の運搬、据付及び維持管理
- (4) プロジェクト運営に必要な、カウンターパート及びその他事務職員の役務

なお、上記に含まれていない事項については、「技術協力に関する日本国政府と、ジョルダン・ハシェミット王国政府との間の協定」（1985年7月16日発効）に基づき、実施されることとなる。

## VI. 専門家の生活環境

センターの設置が予定されているアンマン市および近郊の生活環境は以下の通りである。

### 6-1 住宅事情

日本人の多くは、高級住宅街の多いアンマン市内のシメサニ地区およびアブドゥーン地区に居住している。同地区には家具・食器付きのアパートが揃っており、家賃US\$9,000~12,000/年で3LDKの部屋を借りることができる。通常、礼金ならびに敷金を要求されることはない。

### 6-2 教育事情

日本人学校はなく、日本人会によって毎週土曜日にひらかれている日本語補習校があるのみである。したがって、日本人の子弟の多くはブリティッシュ・スクールないしアメリカン・スクールに通っている。

### 6-3 治安状況

治安上の問題はほとんどなく、夜間の外出も問題ない。

### 6-4 食料事情

日本食の調達是非常に困難である。ただし、日本食以外の食料品はスーパーマーケットで容易に入手できる。アンマン市内には中華レストランが6軒あり、広く利用されている。

### 6-5 医療事情

ほとんどの病院で英語が通じる。日本人の中でも盲腸の手術をうけたり、出産をアンマン市内でおこなったケースもある。医薬分業制度がとられているが、医薬品は英国等から輸入品が豊富に出回っている。また、アンマン及びその近郊には、約300軒の薬局があり、24時間オープンしている。

### 6-6 その他

交通機関はタクシーおよびバスであるが、日本人が容易に使えるのはタクシーである。タクシーにはメーターが付いており、料金は安い。

アンマン市内にスポーツクラブが3~4ヶ所あり、プールおよびテニスコート等の設備を有している。



## VII. プロジェクト実施の妥当性

- (1) 協力分野、内容等多岐にわたっていたが、協議の結果、日本側の体制に応じた範囲に絞り込むことが出来た。(研究開発を対象からはずした)
- (2) 訓練生のリクルート  
訓練生の質及びレベルが当初想定していたより高いことがわかった。  
受託研修等の形で、既に民間からも多数の要請が来ている。
- (3) カウンターパートのリクルート  
本センターは、現RSSのコンピューターDept. のグレードアップ的な要素が強く、本プロジェクトのカウンターパートには、現RSSのスタッフが配属されることが予想され、技術レベルに関しては、極めて優秀であり、特に問題は無い。
- (4) 想定した2つの長期研修コースは、現にJICAの集団コース等で行われているものであり、カリキュラム、テキスト等は、若干の修正は必要となろうが充分実用に耐えられる。

以上の諸点及び本件プロジェクト監督機関であるHCSTの「ジョ」政府における位置付けを勘案すると、本件プロジェクト実施については妥当性は極めて高いものと認められる。

## VIII. 今後の留意事項

(1) 今回の調査でプロジェクトの妥当性が充分確認されたので、長期調査員の派遣の必要性は低いものと思われる。

機材設置に係る基礎工事、空調・電源工事等については検討を要する。

(2) 機材品目、数量について要望が強く、コースの数の増大に伴って今後、要求が継続して出てくるものと思われる。

(3) 本センターの事業予算が原則として、独立採算であることから、収入見込み（研修コース参加者の実績等）について、注意を払う必要がある。

(4) 機材調達の契約については、入札方式を望むが、機材本体の購送専門家の派遣、研修生の受け入れ等一括契約が可能であるが検討を要する。

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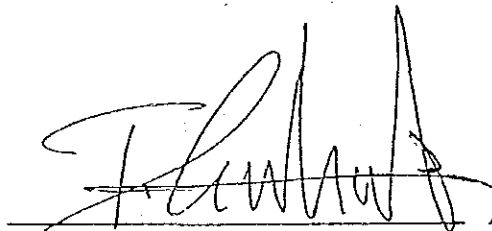
1. 議事録

MINUTES OF MEETING  
BETWEEN THE JAPANESE PRELIMINARY SURVEY TEAM  
AND THE AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE HASHEMITE KINGDOM OF JORDAN  
ON THE TECHNICAL COOPERATION FOR THE PROJECT  
ON THE COMPUTER TECHNOLOGY DEVELOPMENT AND TRAINING CENTER  
IN THE HASHEMITE KINGDOM OF JORDAN

The Japanese Preliminary Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as 'JICA') and headed by Mr. Takeho Sakata, Special Assistant to the Department of Mining and Industrial Development Cooperation of JICA, visited the Hashemite Kingdom of Jordan from August 29 to September 5, 1989, for the purpose of clarifying the outline and background of the Jordanian proposal as well as studying the feasibility on the Japanese Project-type Technical Cooperation for the project on the Computer Technology Development and Training Center in the Hashemite Kingdom of Jordan, based on the Agreement on Technical Cooperation between Jordanian and Japanese Governments signed at Amman of 16, July, 1985.

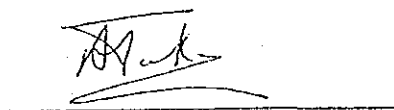
During its stay in Jordan, the Team had a series of discussions to exchange views on the Project with the officials of the Government of the Hashemite Kingdom of Jordan headed by Dr. Abdallah Tukan, Secretary General of the Higher Council for Science and Technology and also made a field survey to the relevant facilities.

As the result of the discussions, both parties reached understandings concerning the matters referred to in the document attached herewith.



Mr. Takeho Sakata  
Leader, Preliminary Survey Team  
Japan International Cooperation  
Agency, Japan

Amman, September 5, 1989



Dr. Abdallah Tukan  
Secretary General  
Higher Council for Science  
and Technology  
The Hashemite Kingdom of Jordan

ATTACHED DOCUMENT

I. Name of the Project

Project-type Technical Cooperation on Computer Technology Development and Training Center (hereinafter referred to as "the Project")

II. Responsible organization for the project Implementation

Higher council for Science and Technology

III. Duration of the Project

The duration of the Japanese technical cooperation would be four (4) or five (5) years from the date of signing of the Record of Discussions (R/D).

IV. Site and facilities of the Project

1. The Team visited the site of the Information and Computer Software Center Building located in Royal Scientific Society in Amman, that is currently being renovated.

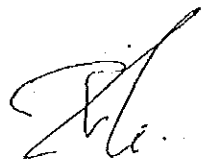
Jordanian side explained that the renovation work was planning to be finished by the middle of September, 1989 and project site would be prepared in a part of this building.

2. The Team explained that the facilities should be composed of the following rooms. (number of rooms, dimension)

- 1) Seminar room (two, 100m<sup>2</sup>)
- 2) Researching room for workshop (four or six, 40m<sup>2</sup>)
- 3) Terminal room (two, 100m<sup>2</sup>)
- 4) Japanese expert's room (one, 40m<sup>2</sup>)
- 5) Computer room (one, 140m<sup>2</sup>~ 160m<sup>2</sup>)
- 6) Debugging room (two, 30m<sup>2</sup>)
- 7) Other necessary rooms

Jordanian side will further study the dimension in consideration of Japanese proposal.

As



V. Outline of the Computer Technology Development and Training Center (hereinafter referred to as "the Center").

1. Jordanian side explained that the Center would be operated on the following guidelines.

1) Objective

The objectives of the Center is to develop manpower in the field of computer technology for the purpose of the promotion of computerization in Jordan as well as other Arab countries.

2) Function of the Center

a) To provide training courses at all levels of the public and private sectors to help the country appreciate, absorb and use information Technology.

b) To carry out the training courses necessary to strengthen the capabilities of Jordanian and participants from other Arabian countries in computer science.

c) To encourage the development of appropriate solution for local as well as regional needs using the latest techniques of software engineering.

d) To strengthen the Jordanian capability in research and development in such fields as Artificial Intelligence, Arabization and software Development.

e) To strengthen the Jordanian capability in using computers in research and development in all sectors.

f) To present new scientific and technological services that were previously unavailable to the Region.

3) Activities of the Center

In order to meet the training objective of the Center, the following courses will be conducted;

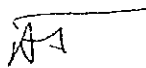
a) Senior Programmer Course (one class × 20 persons × 6 months)

b) System Engineer Course (one class × 20 persons × 6 months)

c) Other necessary short courses corresponding to the need of public and private sector.

The contents of these courses are shown in Annex-1.

4) Organization

The organization of the Center is shown in Annex-2. 

## VI. Outline of the Project

Jordanian side requested the project-type cooperation which consists of dispatch of Japanese experts, provision of equipments to the Center and acceptance of the Jordanian counterpart personnel for the training in Japan.

The Team pointed out that the recruitment of experts would be difficult in the field of the Robotic for industrial engineering, development of Artificial Intelligence and Arabization of Software.

As the result of discussions, both side confirmed that the forementioned fields should be excluded from the scope of the Japanese Technical Cooperation.

### 1. Objective

Objective of the Japanese Technical Cooperation is to transfer necessary knowledge and technique in the field of computer technology to the Jordanian counterpart so as to enable them to carry out the training courses in the Center.

### 2. Scope of the technical cooperation

#### 1) Fields of technology transfer

The appropriate technology transfer to the Jordanian counterpart will be for the following fields:

- a. Programming Languages
- b. Operating System Usage
- c. Database and Data communication
- d. System Design
- f. Project Management





2) Dispatch plan of Japanese experts

In order to transfer the necessary knowledge and techniques to the Jordanian counterpart, Japanese experts will be required as follows.

- a. Chief Advisor
- b. Expert on operating system and computer language
- c. Expert on database and data communication

In addition to this, some experts will be required when necessity arises.

3) Provision of training equipment

Requested equipments for training courses are shown in Annex-3.

4) Acceptance of the Jordanian counterpart

Request of counterpart training in Japan is 4 persons each year.

5) Schedule of implementation

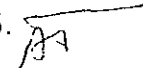
The tentative schedule of implementation for the Project is as shown in Annex-4.

VII. Measures to be taken by the Government of the Hashemite Kingdom of Jordan.

1. The team stressed that, in accordance with the laws and regulation in force in the Hashemite Kingdom of Jordan, the following measures would be taken at the expense of the Jordanian Government for the smooth implementation of the Project.

- 1) To provide building and facilities such as air conditioning, power supply and so on.
- 2) Supply or replacement of machinery, equipment, instrument tools, spare parts and any other materials necessary for the implementation of the project.
- 3) With respect to the equipment, machinery and any other materials supplied by the Japanese side, to bear expenses for transportation within the Hashemite Kingdom of Jordan as well as for installation, operation and maintenance thereof.
- 4) To bear all running expenses necessary for the implementation of the project, budget is shown in Annex-5.
- 5) To secure necessary services of counterpart personnel and administrative staff required for operating the project.

VIII. Others.

1. List of participants in the meeting is shown in Annex-6. 



a) Aim:

This course is designed for the personnel who will be chief programmers.  
The aim of this course is to train application programming skills on main frame computers.

b) Mode of study:

This course will be conducted on a full time basis ,for a period of six (6) months. Lecture, practice, case study and software development workshop would all be part of the course.

c) Qualification of trainee:

1. University graduates.
2. Graduates of computer science course in community college with two years experience.

d) Number of trainee:

Maximum 20 persons

e) Main subject of the course:

1. Programming language
2. Fundamental of Operating system and Hardware system
3. Usage of Operating system and Timesharing system
4. Development database programs and data communication programs on main frame computer
5. Program design and documentation techniques
6. Software development workshop

SYSTEM ENGINEER COURSE

a) Aim:

This course is designed for the personnel who will be project leaders.  
The aim of this course is to train system analysis, system design, system installation and system development project.

b) Mode of study:

This course will be conducted on a full time basis, for a period of six (6) months. Lecture, practice in group and system development workshop would all be part of the course.

c) Qualification of trainee:

1. University Graduates with 3 years practical programming experience
2. Graduates of computer science course in university
3. Graduates of SENIOR PROGRAMMER COURSE

d) Number of trainee:

Maximum 20 persons

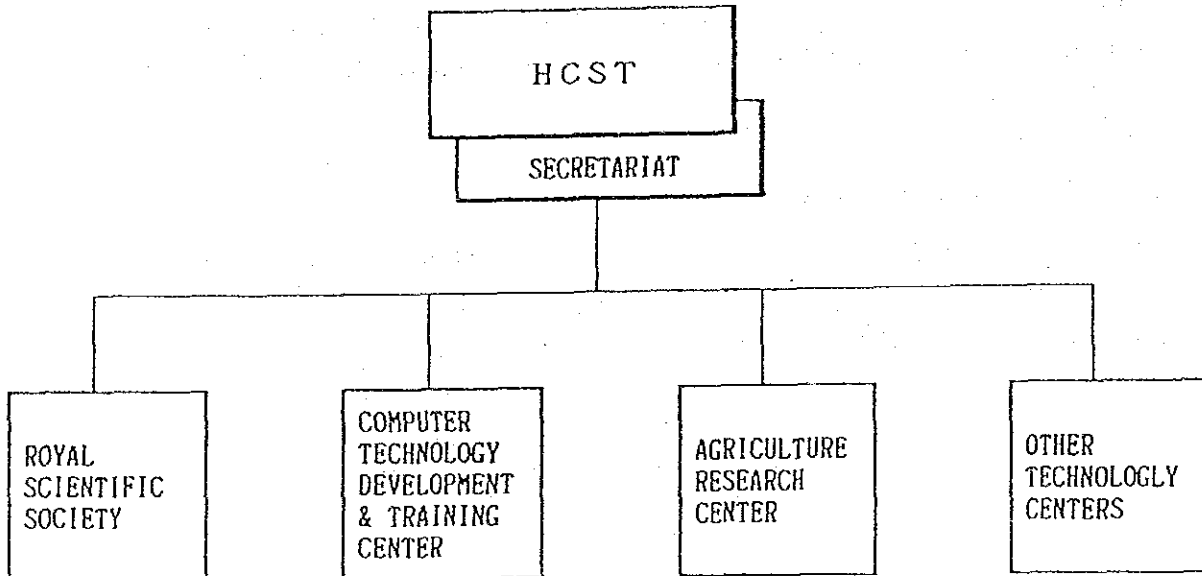
e) Main subject of the course:

1. System analysis
2. Database design and creation
3. Data communication system design and creation (including local area network).
4. Project management simulation
6. System development workshop





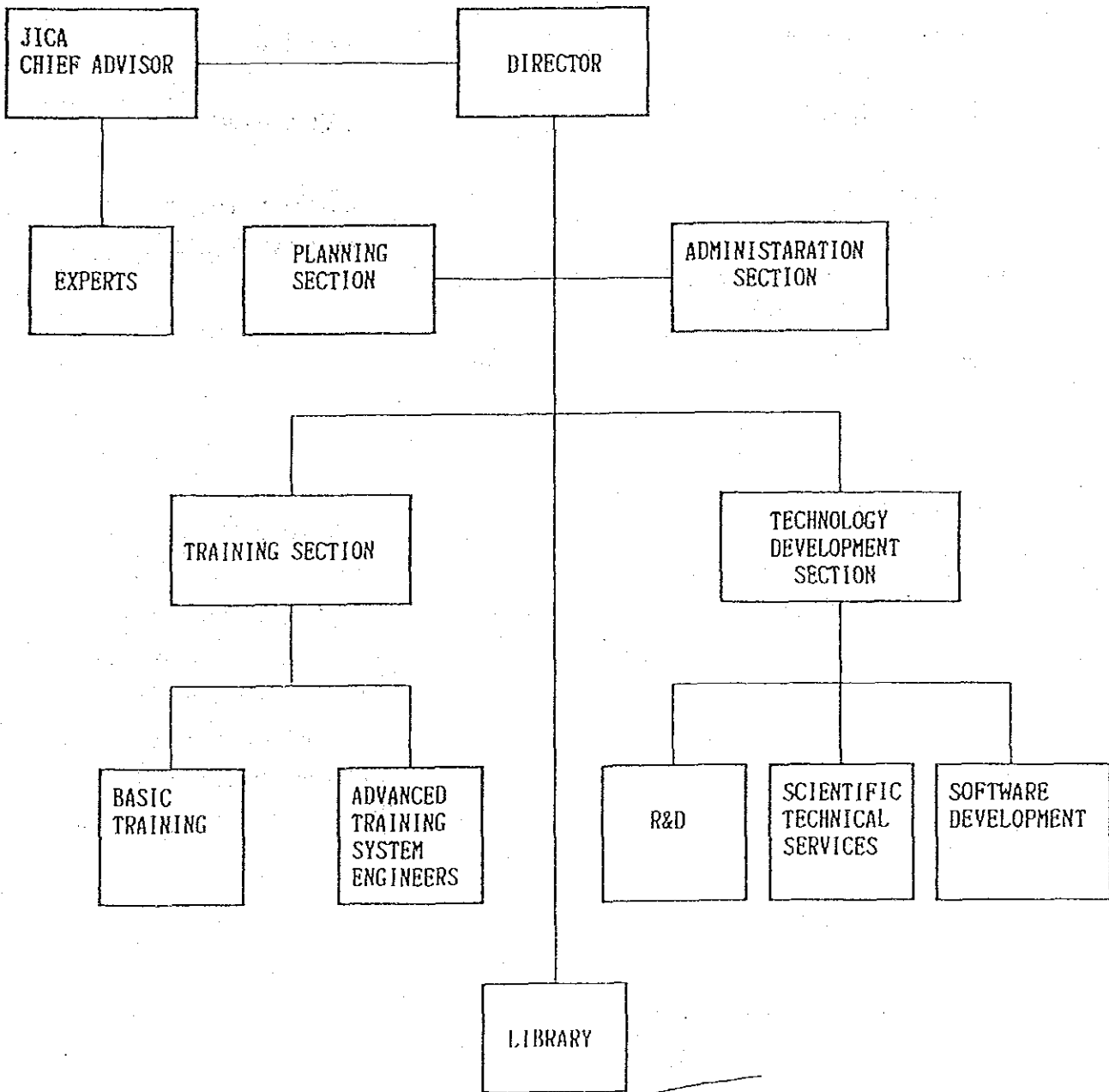
MANAGEMENT AND LINKAGES OF THE  
COMPUTER TECHNOLOGY DEVELOPMENT  
AND TRAINING CENTER



\* This is Subject to change. *AS*

*AS*

ORGANIZATION CHART OF  
THE COMPUTER TECHNOLOGY DEVELOPMENT AND TRAINING CENTER



AT

LIST OF EQUIPMENT

Annex-3

## I. HARDWARE

Name of equipment	Quantity	Remarks
1. Central Processing Unit	1	
2. Main Memory	1	32MB
3. Magnetic Disk Unit	3	over 6GB
4. Magnetic Tape Unit	4	6250/1600BPI
5. Line Printer	1	at least 1000LPM
	1	at least 600LPM
6. Personal Computer (terminal)	50	
7. Maintenance Parts, Tools	1 set	

## II. SOFTWARE

Name of equipment	Quantity	Remarks
1. Software (Main Frame)	1 set	· Operating System (UNIX and other operating system under virtual machine environment) · Languages processor · Database/Data communication
2. Software Manual	2 sets	
3. Education material	2 sets	
4. Project management training tool	8 sets	

## III. MISCELLANEOUS

Note: Jordanian side requested more equipments to be provided if the training courses would be more expanded.

## TENTATIVE SCHEDULE OF IMPLEMENTATION

Item	Preparation	1st. Year	2nd. Year	3rd. Year	4th. Year	5th. Year
A. Jordanian side						
1. Facilities preparation						
2. Budgetary Allocation						
3. Manpower Allocation						
B. Japanese side						
1. Dispatch Survey Team						
a) Preliminary survey						
b) Implementation survey						
c) Consultation						
d) Technical Guidance						
e) Evaluation						
2. Dispatch of Experts						
a) Long Term Experts						
· Chief Advisor						
· Operating system & Computer language						
· Database & data communication						
b) Short term expert (*)						
3. Counterparts training in Japan(**)						
4. Provision of Equipment						
C. Training Courses						
1. Senior Programmer Course						
2. System Engineer Course						
3. Other Short Courses						

Note: This tentative schedule is as the case of 5 years for technical cooperation.

(\*) on specific fields, if necessary and some experts will be dispatched before implementation survey team

(\*\*) four counterpart will be accepted each year and on top of those, two or three maintenance engineers will be accepted before the installation of equipment.









Annex-6

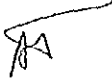
List of Participants

I. Japanese Side

1. Mr. Takeho SAKATA      Leader  
Special Assistant to the Department of Mining and  
Industrial Development Cooperation, JICA.
  
2. Mr. Noritaka NAGASHIMA      Information Technology  
Deputy Director, Industrial Electronics Division,  
Machinery and Industries Bureau,  
Ministry of International Trade and Industry
  
3. Mr. Takashi MORI      Data Communication  
Frequency Planning Division, Radio Department  
Telecommunications Bureau,  
Ministry of Posts and Telecommunication.
  
4. Mr. Eisaku OSHIMA      Equipment Planning  
Consultant Business Administrative Division,  
Center of the International Cooperation for  
Computerization
  
5. Mr. Hiroshi HARUKI      Computer Training  
Consultant Business Administrative Division,  
Center of the International Cooperation for  
Computerization
  
6. Mr. Hiroshi KURAKATA      Coordinator  
Project Management Officer, Technical Cooperation  
Division  
Mining and Industrial Development Cooperation  
Department JICA



II. Jordanian Side

1. Dr. Ghassan MUFLEH      Director/Information technology Section  
Higher Council for Science & Technology
2. Dr. Yusef NUSSEIR      Director/ Information & Computer S/W  
Center- RSS
3. Dr. Taleb SAREI      Director/ Computer Center  
Jordan University 



## 2. コンピューターユーザー視察報告

### 1. Royal Scientific Society

(1) 日時 : 8/29 pm

(2) 面談者 : Dr. YOUSEF A. NUSSEIR

(3) システム :

- ・ NCR8200×2、パック式DASD×8、MT×4、LP×2
- ・ PCはIBMコンパチ機多種 (UNIX使用)
- ・ R&D, STIC (Science & Technology Information Center), MIS (Management Information System) の3つのネットワークを持つ。

(4) トピックス :

- ・ ホストは10年前の機種を使用しており、ホストのパワー不足が否めない。
- ・ 研究開発用にPCが主に使われている。UNIXベース現であり、スンドアロンまたはミニコン・ホストへのオンライン接続で使用されている。
- ・ カレッジで2年間のコンピューター基礎コース (主にパソコンレベル) を運営している。

### 2. ARAB BANK

(1) 日時 : 8/30 pm

(2) 面談者 : Mr. HASEM F. KASSAB

(3) システム :

- ・ 1973年設立、NCRクライテリオンを導入し、1982年にIBM機にリプレース  
14381、14341、13370、MT×3、レーザーLP (ARABIC) ×3、LP×2を使用。
- ・ 国内に26支店、150端末、アラブ近隣諸国では最大の銀行

(4) トピックス :

- ・ EDPスタッフは100名以上34名が開発 (ANALYST・PROGRAMMER) に従事  
主としてオペレーションを行う JORDAN COMPUTER CENTER (40~45名) を持つ。
- ・ 新センターに期待することは "Follow up Technical Trend" と "Catch up New Products"

### 3. ROYAL JORDANIAN

(1) 日時 : 8/31 am

(2) 面談者 : Mr. ARWAD ABDEL-DEAM

(3) システム :

- ・ 14381、14341 (計5.6Mips 24MB, VM/SP, SQL, VTAM 使用)、運搬232 端末、全世界で859端末

- ・ DP部門は59名、Appication Develop, Technical Support, Operationのセクションから成る。

(4) トピックス :

- ・ 大卒者にはミニコン、PCを使える人材はいるが、大型機を使える人間がいない。
  - ・ プログラマー、システムアナリストは大学卒業程度で十分だが、プロジェクト管理スキル、システム開発技法(標準化、ドキュメント)のスキル不足がヨルダンの課題である。
- Technical Support, Standard Development, Project Management, Latest Technical Areaのエンジニアが必要である。

#### 4. Jordan Electricity Authority

(1) 日時 : 8/31 pm

(2) 面談者 : Mr. F. ANSHASI

(3) システム :

- ・ VAX 8530×2、 $\mu$ VAX -2000×1、 $\mu$ VAX -II×2による分散システム
- ・ 端末数約200、パソコン約40台のネットワークを構成

(4) トピックス :

- ・ ミニコンでかなり広範囲のネットワークを構築しており、コストパフォーマンスのよい分散システムとなっている。

#### 5. Jordan University

(1) 日時 : 9/3 pm

(2) 面談者 : Dr. TALEB SAREI

(3) システム :

- ・ VAX 8700×2、 $\mu$ VAX ×5、約330端末によるネットワークシステムを構築

(4) トピックス :

- ・ かつてIBMも使用したが、PCからスーパーミニコンまでFull Compatibleな点保守コストの点で、DECにリプレースした。
- ・ ソフトはほとんどが自主開発である。

LAW NO. 30 FOR THE YEAR 1967  
LAW OF THE HIGHER COUNCIL FOR SCIENCE AND  
TECHNOLOGY

ARTICLE 1:

This law shall be cited as (The Law of the Higher Council for Science and Technology for the year 1987) and it shall come into force after thirty days from its publication in the Official Gazette.

ARTICLE 2:

In this law, unless the context otherwise require, the following words and expressions shall have meanings respectively assigned thereto:

The Council:

The Higher Council for  
Science and Technology  
established in accordance  
with this law.

The President:

President of the Council.

The Secretary General:

Secretary General of the  
Council.

ARTICLE 3:

a. A council, called "The Higher Council for Science and Technology" shall be established in the Kingdom. It shall have legal entity with financial and administrative independence. In this capacity it may carry out all legal acts including, the signing of agreements, own properties movable & immovable, borrow, sell, mortgage, donate, accept donations and gifts and endowments and wills and waqf. It shall be represented by the Attorney General in all legal matters and judicial proceedings related to its acts or arising therefrom.



The Higher Council for Science and Technology

LAW No. 30  
1987

b. The Council shall be situated in the city of Amman.

**ARTICLE 4:**

The Council aims at building a national scientific and technological base, and assisting and developing it for the purpose of achieving the economic, social and cultural development in the Kingdom.

**ARTICLE 5:**

a. The Council shall be formed under the chairmanship of the Crown Prince with the membership of the following

- 1- The Commander-in-Chief of the Jordanian Armed Forces.
- 2- The Minister of Planning.
- 3- The Minister of Industry and Trade.
- 4- The Minister of Finance.
- 5- The Minister of Higher Education.
- 6- The Minister of Energy and Mineral Resources.
- 7- The Minister of Agriculture.
- 8- The President of the Royal Scientific Society.
- 9- The President of the Amman Chamber of Industry.
- 10- The Secretary General of the Council.
- 11- Three Persons of qualification and experience to be appointed by the President for four years.

b. The President shall appoint one of the members of the Council to be Vice-President.

c. The Council shall hold its sessions whenever it is deemed necessary, on the invitation of the President or Vice-President when the former is absent. The presence of the majority of the members including the President or Vice-President shall constitute a quorum. Resolutions of the council shall be passed unanimously or by the majority of those present. In the case of equal votes, the president shall have a casting vote.

**ARTICLE 6:**

In fulfillment of the objectives described in this law, the Council shall exercise the following powers and responsibilities:

- a. To ratify the general policy of science and technology in the Kingdom and to define its priorities, draw programs and plans arising therefrom and to follow up its implementation and evaluation.
- b. To draw a strategy suitable for the development of scientific and technological potential in the Kingdom and to prepare for the required suitable environment.
- c. To support institutions and units of scientific and technological research and to provide funding required for upholding scientific and technological research as well as scientific & technological services and activities in the Kingdom.
- d. To participate in the preparation and supply of manpower and technical needs for the scientific and technological research institutions.



- e. To specify conditions and requirements to be available in the accredited and distinguished scientific centers and to make sure that such centers are assisted and developed.
- f. To ratify the principles & basis in accordance with which the Council will provide financial aid to the scientific and technological research, programs services and activities as to coincide with the national policy in those fields.
- g. To ratify the annual budget and to supervise the compliance therewith.
- h. To draw draft laws and regulations that concern the Council.
- i. To represent Kingdom before the Arab, regional and international institutions and bodies concerned with science and technology.
- j. To establish scientific and technological cooperation and to conclude agreements related to the scientific and technological research with the local, Arab, regional and international organizations, and to work out coordination with them.
- k. To discuss any matters that the Council may decide to place for discussion.

**ARTICLE 7:**

- a. The Council may establish specialized centers of scientific and technological research to be attached to it.
  - b. The Royal Scientific Society will be considered one of those centers referred to in paragraph (a) of this article, and to be attached to the Council.
- By-laws, in accordance with this law, shall be drawn to regulate the activities of the Royal Scientific Society, including its objectives

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- and duties and those of the centers and branches that come under it, provided that the rules issued in accordance with the articles of association of the RSS shall remain in force until replaced or substituted.
- c. Subject to paragraph (b) of this article, the Council shall assume the powers of the Board of Trustees of the Royal Scientific Society prescribed in its article of association.

**ARTICLE 8:**

- a. The Council shall have a general secretariat for which a Secretary General will be appointed by a Royal Decree on the recommendation of the Council which shall specify the salary and the other financial rights of the said Secretary.
- b. The Secretary General shall supervise the administrative and financial responsibilities of the Council, and for that purpose he shall exercise the powers and duties specified in this Law and the regulations issued in accordance therewith.

**ARTICLE 9:**

The Council shall have an independent annual budget. The financial resources of the said budget may be derived from the following sources:

- a. The funds allocated by the government to the Council.
- b. The revenues of the properties movable and immovable, owned by the Council and the dividends of its investment projects.
- c. Grants, subsidies, donations, contributions, wills and proceeds of trusts made in favor of the Council.

**ARTICLE 10:**

The Council shall enjoy all exemptions and facilities accorded to ministries and government departments.

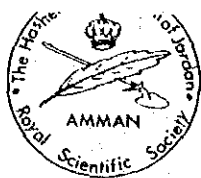
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ARTICLE 11: The Council of Ministers may on the recommendation of the Council, issue regulations necessary for the implementation of the provisions of this Law, including regulations related to matters of administration, finance, employees, experts and advisers.

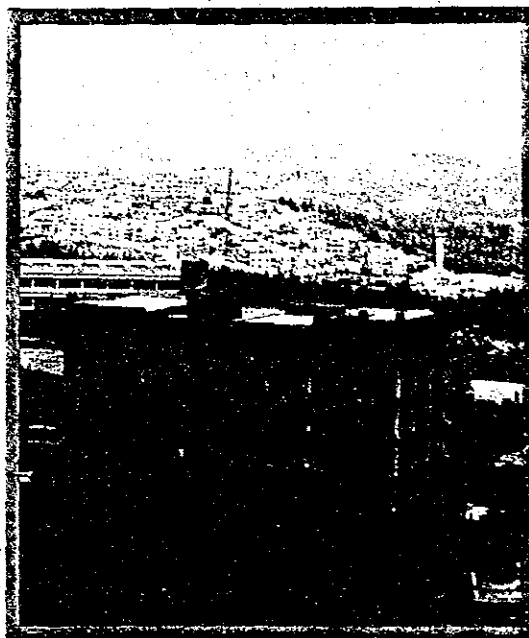
ARTICLE 12: The Prime Minister and Ministers are entrusted with the implementation of this Law.

*M. Hussein Bin Jabal*  
*24.8.1987*

#### 4. 王立科学院 (RSS) 概要



# ROYAL SCIENTIFIC SOCIETY



AMMAN — THE HASHEMITE KINGDOM OF JORDAN

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## Foreword

The Royal Scientific Society (RSS) is a research and development institution whose main function is to provide research, testing and evaluation services in scientific and technological fields, using highly qualified and well-trained manpower and utilizing the best advanced equipment in order to achieve the highest level of performance.

The basic mission of RSS is to promote scientific research and the scientific spirit, to take part in creating an effective climate which helps the process of qualitative construction, and to participate in meeting Jordan's needs and development requirements in an appropriate manner.

RSS plays its role within the context of a general policy drawn up for science and technology which reflects the aspirations of His Majesty King Al-Hussein, the leader of Jordan and the pioneer of its development process. It has been helped in its progress by the enthusiastic spirit and determination of His Royal Highness Crown Prince El-Hassan, to whom thanks are due for his patronage of RSS and his continued support since RSS came into existence in 1970.

This brochure gives an idea of the work of RSS and the activities of its departments and centres, supported with figures and pictures. This is made on a selective basis with the aim of highlighting some basic aspects, without, it is hoped, neglecting the required comprehensiveness.

In view of RSS desire to contribute to local and regional development, it is quite ready to extend its specialized services to all and to put its capabilities and facilities at the disposal of those who may find them useful, whether inside or outside Jordan.

**Jawad Anani**  
**President**

## 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 has been made one of the scientific and technological centres of the *Higher Council for Science and Technology*, established in 1987 under the chairmanship of His Royal Highness Crown Prince El-Hassan, with the following eminent persons as members:
  - . The Commander-in-Chief of the Jordanian Armed Forces
  - . The Minister of Planning
  - . The Minister of Industry and Commerce
  - . The Minister of Finance
  - . The Minister of Higher Education
  - . The Minister of Energy and Mineral Resources
  - . The Minister of Agriculture
  - . The President of the Royal Scientific Society
  - . The Chairman of Amman Chamber of Industry
  - . The Council Secretary General
- In addition, there are three other qualified and experienced persons chosen by the chairman for four years.
- RSS is administered by a President, four Vice-Presidents and department directors.
- RSS started its activities at the offices of the Central Bank of Jordan. It then moved to a rented building in Amman before acquiring its present permanent site at Jubaiha, near Amman, which it occupied in February 1972.
- The area of the permanent site is 342,000 square metres.
- The buildings and laboratories cover a floor area of 28,127 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 international and regional organizations.
- RSS consists of the following departments and centres:
  - . Mechanical Engineering Department
  - . Industrial Chemistry Department
  - . Electronic Services and Training Centre
  - . Economic Research Department
  - . Administrative Affairs Department
  - . Solar Energy Research Centre
  - . Building Research Centre
  - . Computer Department

. Budget, Follow-up and Audit Department

. Public Relations Department

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

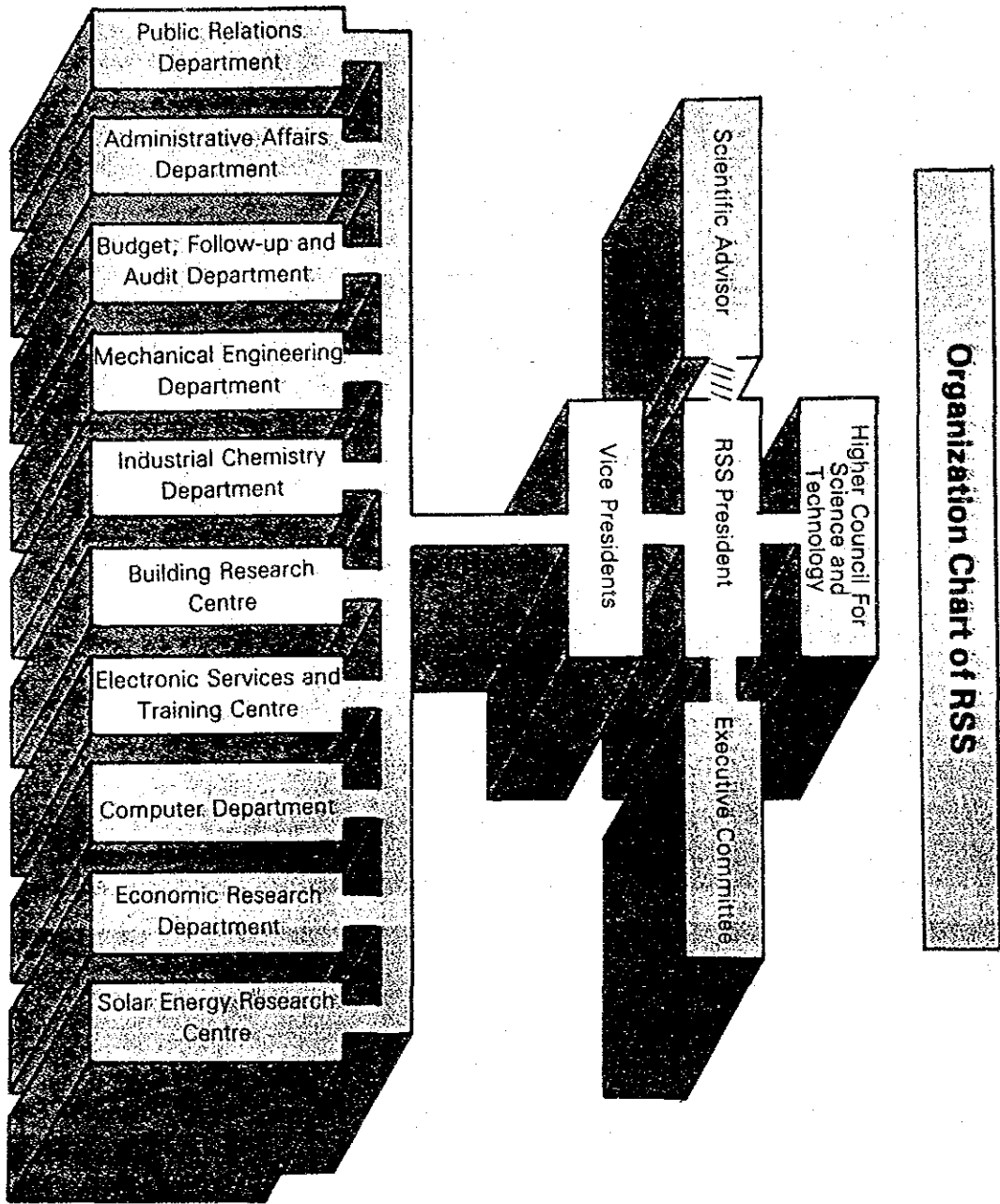
The Royal Scientific Society aims at conducting scientific and technological research and development work related to the development process in Jordan with special attention to industrial research and services. It also aims at disseminating awareness in the scientific and technological fields and at 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 Society's 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 within 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 the 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 areas 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 Society's scope and field 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, 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 consultation and creating opportunities for highly specialized technical training



## 1. Electrical and Electronic Engineering

Following is a summary of the activities of RSS in this field:

### a. Maintenance of Electrical and Electronic Equipment

RSS provides maintenance services for different electrical and electronic equipment, such as:

- Medical equipment
- Telecommunications equipment
- Industrial systems and equipment

### b. Testing and Applying Specifications

Through its specialized laboratories, RSS carries out tests on different electrical and electronic materials, products and equipment and it applies national and international standards and specifications. This activity covers the following products and materials:

- Electrical and electronic materials like wires, sockets, circuit breakers and dry batteries
- Audio and visual equipment like radios, recorders and television sets
- Household electrical appliances like irons and heaters
- Lead-acid batteries
- Other electrical materials, whether imported or locally made

### c. Calibration of Electronic Equipment

RSS uses advanced electronic calibration equipment and primary standards in carrying out its services of calibrating the different electronic devices used in testing and measuring.

RSS laboratories are officially accredited to calibrate equipment used in the workshops of airline companies and in telecommunications. Moreover, RSS laboratories are quite capable of calibrating other electronic devices.



Testing and maintenance of electronic equipment

**d. Technical Consultations**

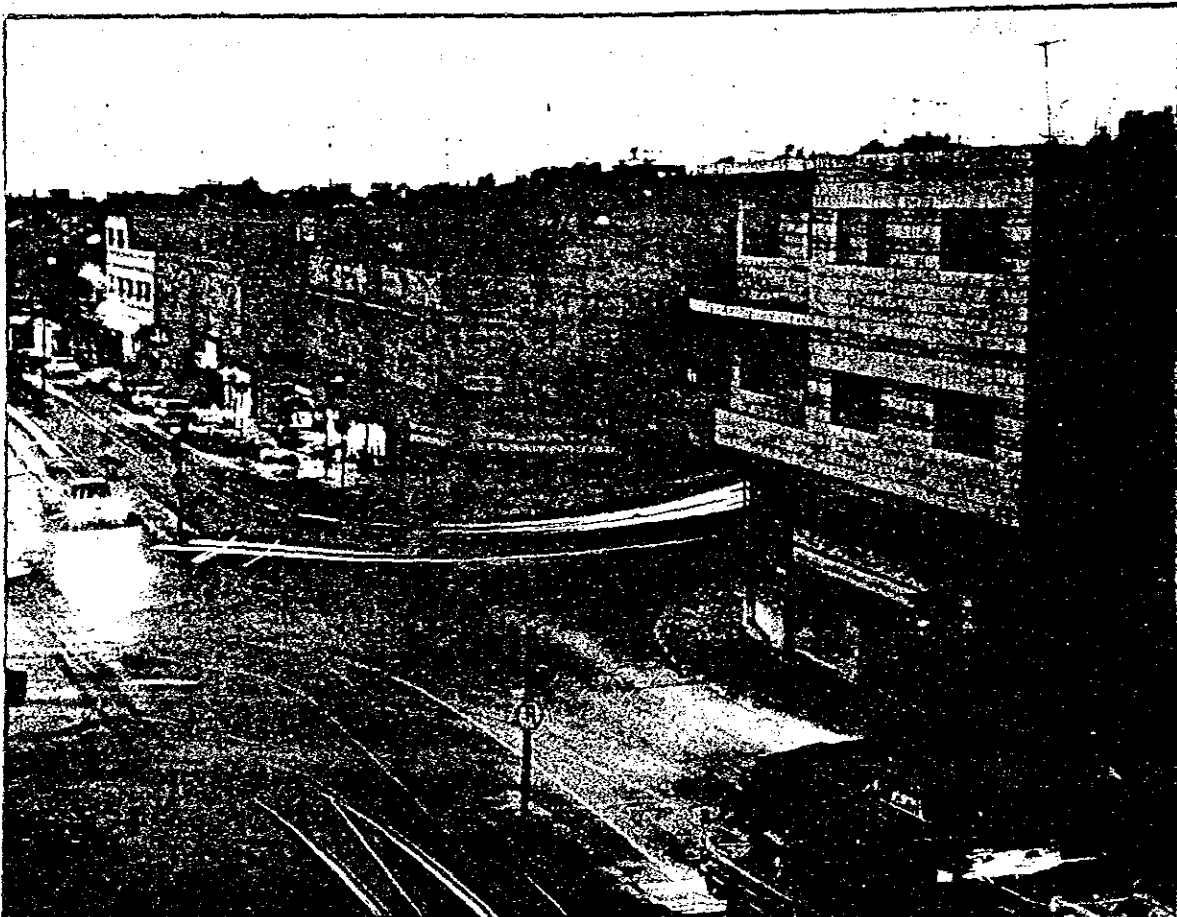
RSS offers technical consultations in the field of electrical and electronic equipment through:

- Studying and assessing tenders of electrical and electronic equipment
- Testing and receiving electrical and electronic systems and equipment

**e. Designing and Developing Various Equipment**

RSS designs and develops electrical and electronic equipment such as:

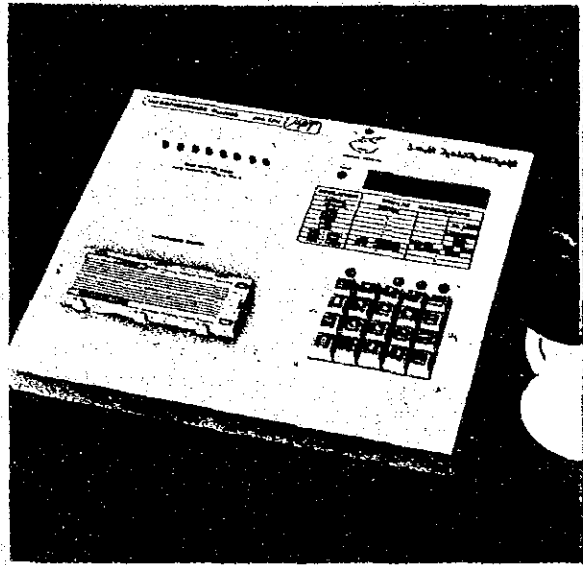
- Training and educational equipment
- Telecommunications equipment
- Electrical and electronic laboratory equipment
- Electronic control systems such as traffic light control systems
- Microprocessors



*Traffic light project - Irbid*



Dual power supply - designed and produced by RSS



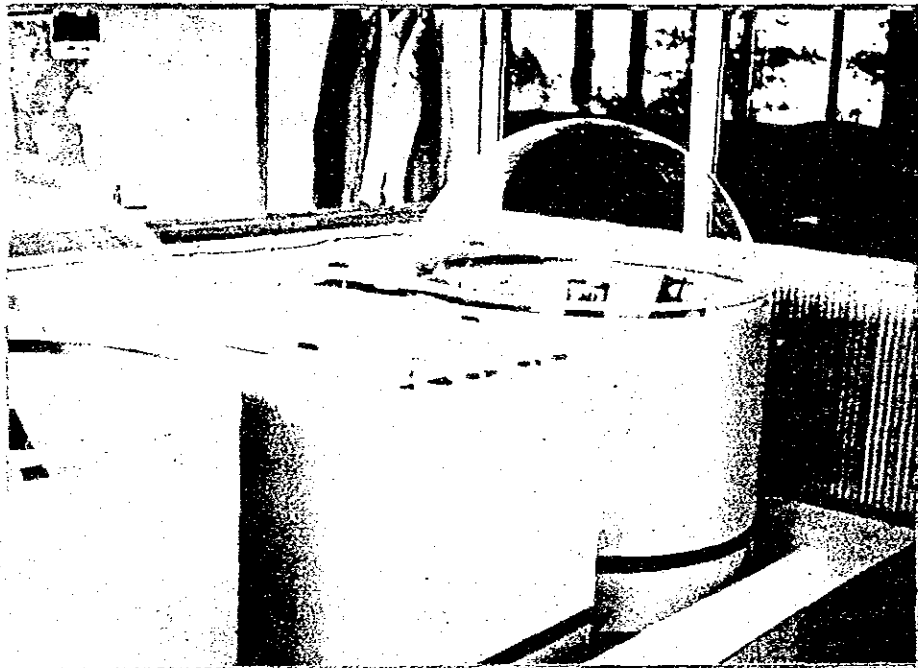
Microprocessor trainer - designed and produced by RSS

## 2. Chemical Industries

Activities of RSS in this field can be summarized as follows:

### a. Paints, Fuels and Lubricants

RSS conducts scientific research and studies, offers consultations concerning paints, lubricants and other petroleum materials and provides advanced services to this industry.



RSS Paint Laboratory

**b. Technology of Inorganic Materials**

RSS carries out research and studies and offers consultations and services concerning raw inorganic materials, particularly those used in different industries and products. It also conducts studies on raw materials used in ceramic and glass industries with the aim of determining the appropriate kinds and, thereafter, upgrading their final products.

**c. Technology of Organic Materials**

RSS conducts applied research and studies and offers technical services and consultations in the field of organic materials and related industries, such as food and feedstuff, insecticides and detergents with the aim of upgrading products and improving quality.



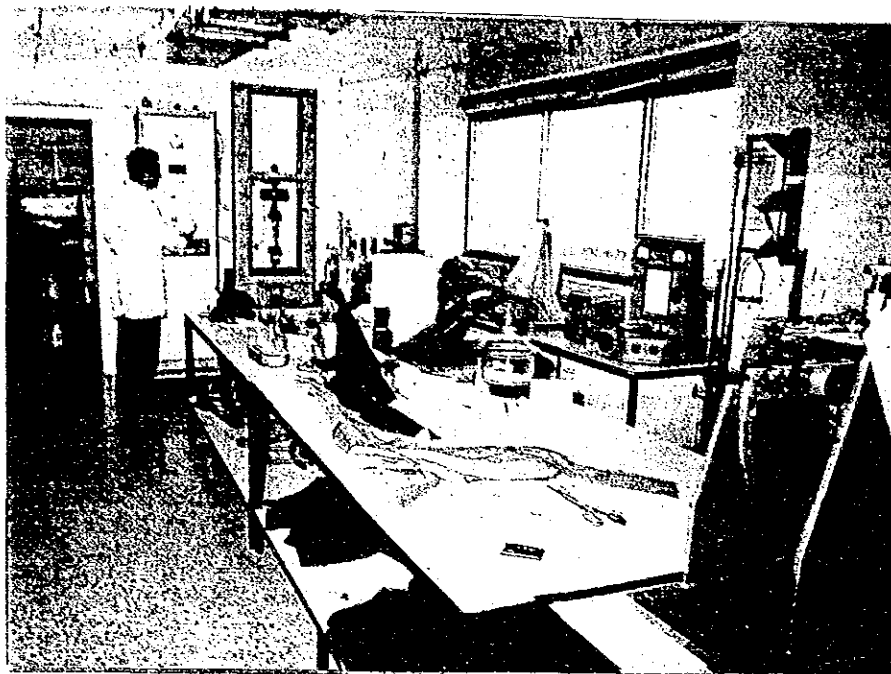
Microbiological testing of foodstuffs

**d. Paper and Cardboard**

RSS offers technical services and consultations and carries out test and quality control on imported and locally made paper goods in accordance with Jordanian and international standards and specifications with the aim of providing high quality goods. RSS also participates in drafting Jordanian standards and specifications.

**e. Textiles**

RSS offers technical services and consultations, tests and quality control on imported and locally made textiles in accordance with Jordanian and international standards and specifications and participates in drafting the related Jordanian specifications. Many local textile factories make use of this service in testing and developing their products.



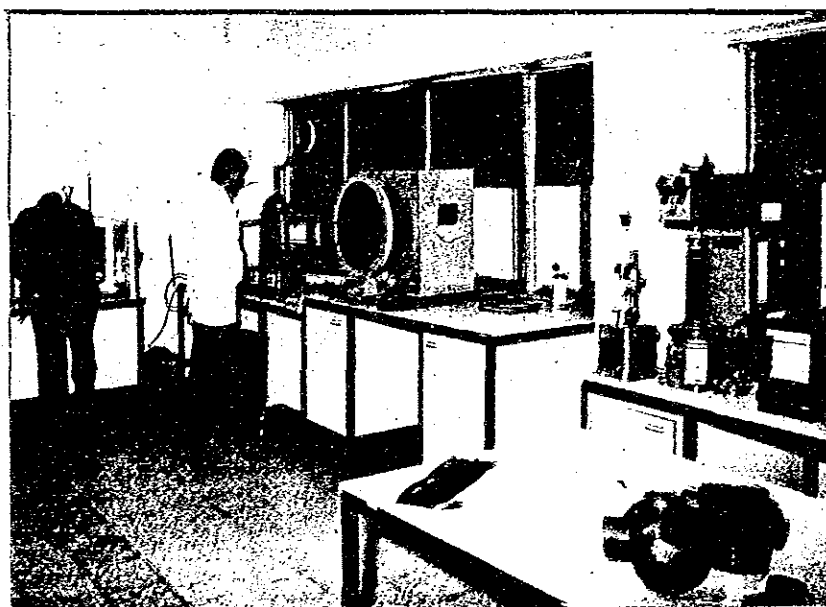
Textile, Paper and Leather Laboratory

**f. Leather**

RSS carries out tests and quality control on leather and local tanning products and ensures the application of Jordanian specifications. In this respect, RSS can make tests related to thickness, surface shrinkage, specific gravity, tensile strength, elongation, tearing resistance, humidity, ash content, fat content, chrome oxide and PH.

**g. Plastic and Rubber**

RSS offers technical services, carries out consultative studies in this field and monitors production development to enhance and develop the quality of plastic and rubber products. In this regard, RSS carried out a comprehensive study on the utilization of plastic films in protected agriculture.



Testing plastic and rubber materials

### 3. Mechanical Industries

Mechanical industries are one of the widest industrial fields. They form the backbone of all other industries, as all machinery, warehouses, buildings and the like are produced by mechanical industries. The activities of RSS in this field can be summarized as follows:

**a. Steel Industries**

RSS renders technical services and consultations to these industries under agreements it signs with various factories with the aim of applying quality control to their products and working out solutions to the technical problems they face.

**b. Foundry**

RSS carried out an industrial survey to identify the technical level of workers in this field and found out that there is a shortage in experienced manpower and a need to intensify efforts to upgrade the technical level. Hence, RSS concentrates on providing highly specialized technical training to bridge this gap. It has set up a model foundry workshop to study the different technological factors necessary for the foundry process, whether in relation to raw materials like sand and scrap iron or to smelting, moulding and heat treatment technology.

**c. Aluminium Industry**

RSS carries out tests on aluminium products to identify their fitness and conformity with standards and specifications.

Furthermore, RSS conducts studies aiming at identifying the effect of weather and chemicals on the anodized layer of aluminium sections.

**d. Non-Destructive Testing for Metal Industries**

RSS carries out non-destructive quality control tests (consisting of industrial X-ray and Gamma ray tests, radiography, ultrasonic, magnetic particle and liquid penetrant tests) on welding used in pipelines, steel tanks, water pumping and power stations and all other mechanical constructions and industries.

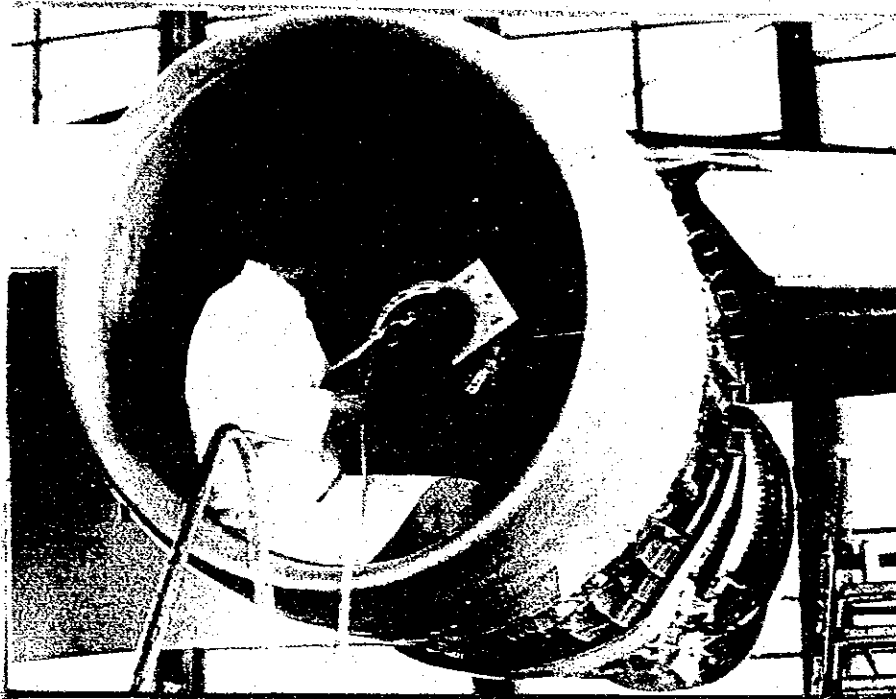
**e. Industrial Models**

RSS produces different industrial models such as moulds and equipment used in building and energy applications.

**f. Welding**

RSS has set up a model welding unit equipped with the necessary machinery for introducing efficient welding methods to be used in different kinds of metal and industrial applications. This unit can also provide workers in this field with expertise and specialized training. RSS is in the process of conducting a study aiming at repairing some costly parts in the big factories that need such a service.





Non - destructive testing

#### **4. Environment**

RSS plays an effective role in the field of environment monitoring and public safety. Its activities in this field include monitoring air and its pollutants (like gases, dust and radiation), surface water, waste water and dangerous chemicals. The most notable activities that are carried out by RSS in this field are as follows:



Continuous monitoring of water pollution

**a. The National Project for Monitoring Water Pollution in Jordan**

This project aims at monitoring the quality of water in Jordan (excluding the Aqaba region). Drinking water, mineral water, industrial discharge, sewage water and certain drainage basins are all monitored so that a clear picture of water quality and water environment in Jordan is acquired.

Monitoring is done through running regular and periodic tests on water samples taken from different sites.

**b. Waste Water Study of Khirbeh Al-Samra Treatment Plant**

This study aims at monitoring the quality of waste water in the treatment plant and the changes which occur to it and identifying the possibility of using the effluents in agriculture. The study also aims at establishing design criteria for this type of water treatment plant and monitoring its efficiency in countries where weather is similar to that of Jordan.

**c. Monitoring Water in King Talal Dam**

RSS monitors the water quality of this dam, the seasonal and annual changes which occur and its suitability for recycling.

**d. Treatment of Cyanide Resulting from Industry**

The Aluminium industry leads to the production of Cyanide which is a highly toxic pollutant. RSS treats this toxic pollutant to keep it within the permissible limits.

**e. Monitoring Waste Water Treatment Plants in Industry**

In this field, RSS monitors waste water treatment plants in different factories and identifies means of improving the performance of these plants to obtain highly purified water which complies with the national specifications in order to be reused for agricultural and industrial purposes.



Regular monitoring of water treatment plants

**f. Monitoring Air Pollution**

RSS carries out tests necessary to identify air quality, air pollution percentage and primary and secondary sources of this pollution in the Greater Amman Area in particular, and in the other parts of the Kingdom in general. A mobile testing station was designed and installed by RSS for this purpose.

**g. A Study on Handling Dangerous Chemicals**

RSS conducted a comprehensive survey of all dangerous chemicals available in the Jordanian markets. This study was made to identify the chemical, physical and toxic characteristics of these chemicals to decide how to handle them during transportation and stocking, how to avoid the dangers they cause and how to combat such dangers when they occur. A guide book was issued to be referred to when dealing with such materials and it can be obtained from RSS.

**h. The National Project for Radiation Protection**

This project aims at measuring radiation doses absorbed by people working in radiation application in Jordan, measuring levels of radiation at working, storage and transportation sites, testing the contamination in imported foodstuffs, and at environmental monitoring. Within the scope of this project, RSS issues certificates for radioactive materials transported by air, trains Jordanian cadres and offers consultations in the field of radiation protection.



Foodstuffs tested for radiation

**i. Publication of Scientific Books and Brochures**

Within the series of Scientific Reading Books which RSS publishes to promote and disseminate scientific knowledge and awareness among children and adults, two books have been published on pollution in general and on water pollution:

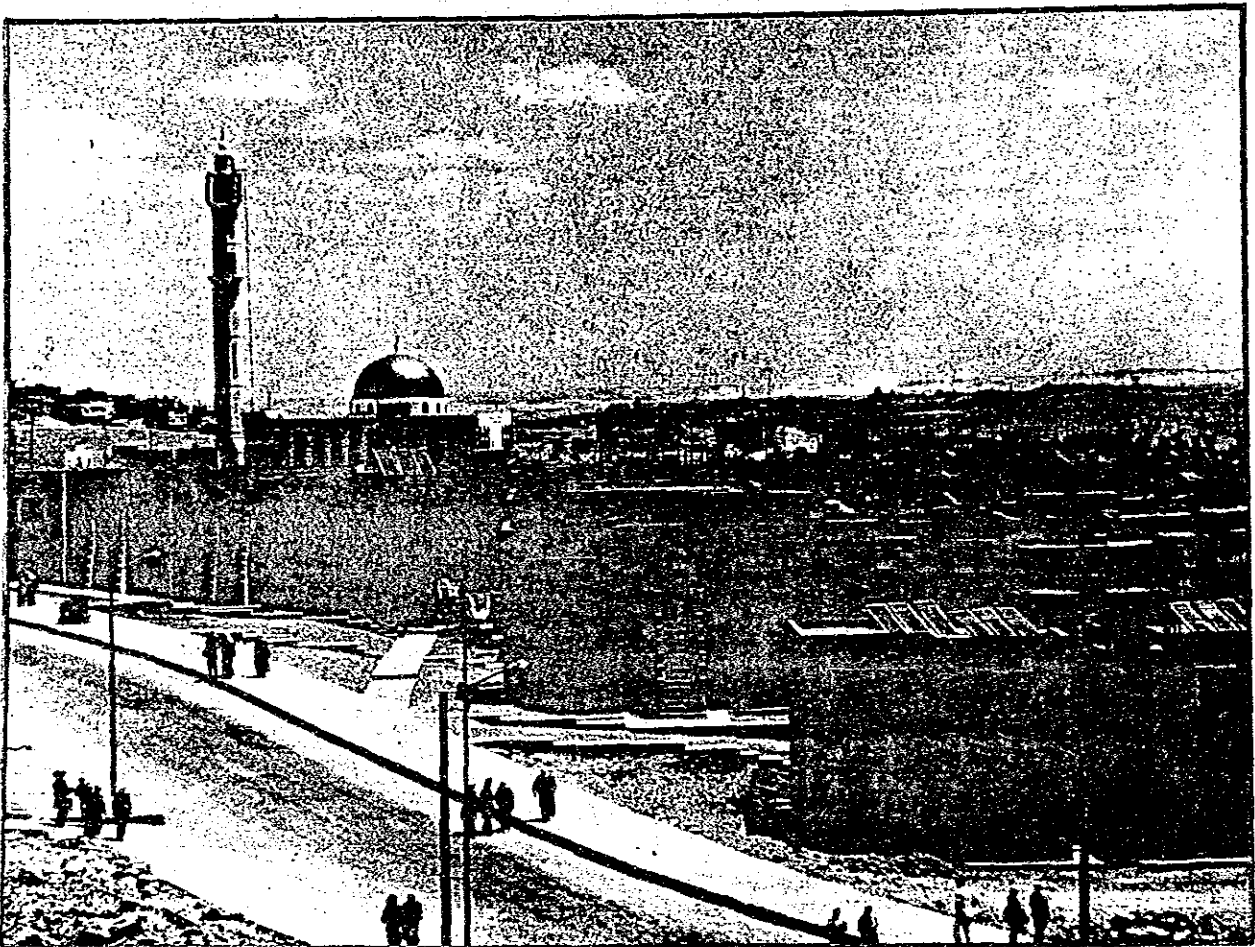
## 5. Construction:

RSS continues to support the development and growth of the construction sector by conducting applied research and studies and providing technical and laboratory services in the fields of building, construction and road technologies. The main activities of RSS in this area are as follows:

### a. **Building System No.5**

(a building system for low-income groups)

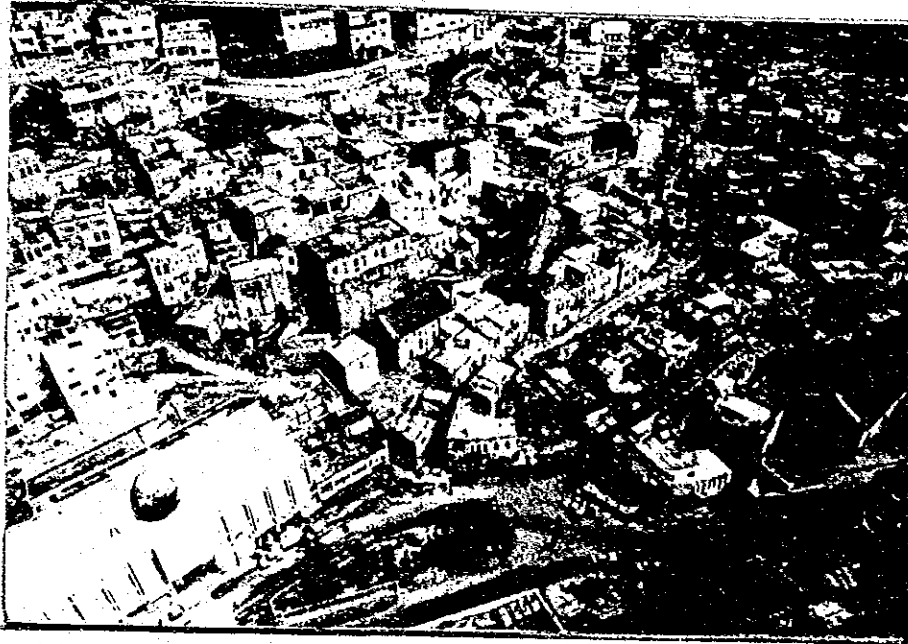
Building System No.5 is a semi-industrialized precast concrete building construction system which has been developed by RSS for the construction of housing for low-income groups. It applies the concepts of industrialization in that it is based on mechanized processes of a repetitive character. The mechanization employed, however, is simple and easy to manufacture and maintain locally. At the same time, both the components employed and the assembly method are similar to conventional products and procedures, making it simple for local technicians to adapt to the new system. RSS has built several test buildings in the process of development of the building system, and has recently finished the construction of 174 Housing units at the Housing Corporation's Prince Talal Housing Project in Rusiefeh and a secondary school at Baq'a.



Building System No.5 applied in Prince Talal Housing Project - Rusiefeh

**b. National Building Code of Jordan**

RSS continues to pursue its work on the drafting of the National Building Code of Jordan, which consists of a set of 23 volumes. The Code defines the rules and regulations as well as the technical, administrative and practical requirements in all fields related to building. It deals with design, execution and the minimum requirements to ensure good quality, durability and protection of lives and property.



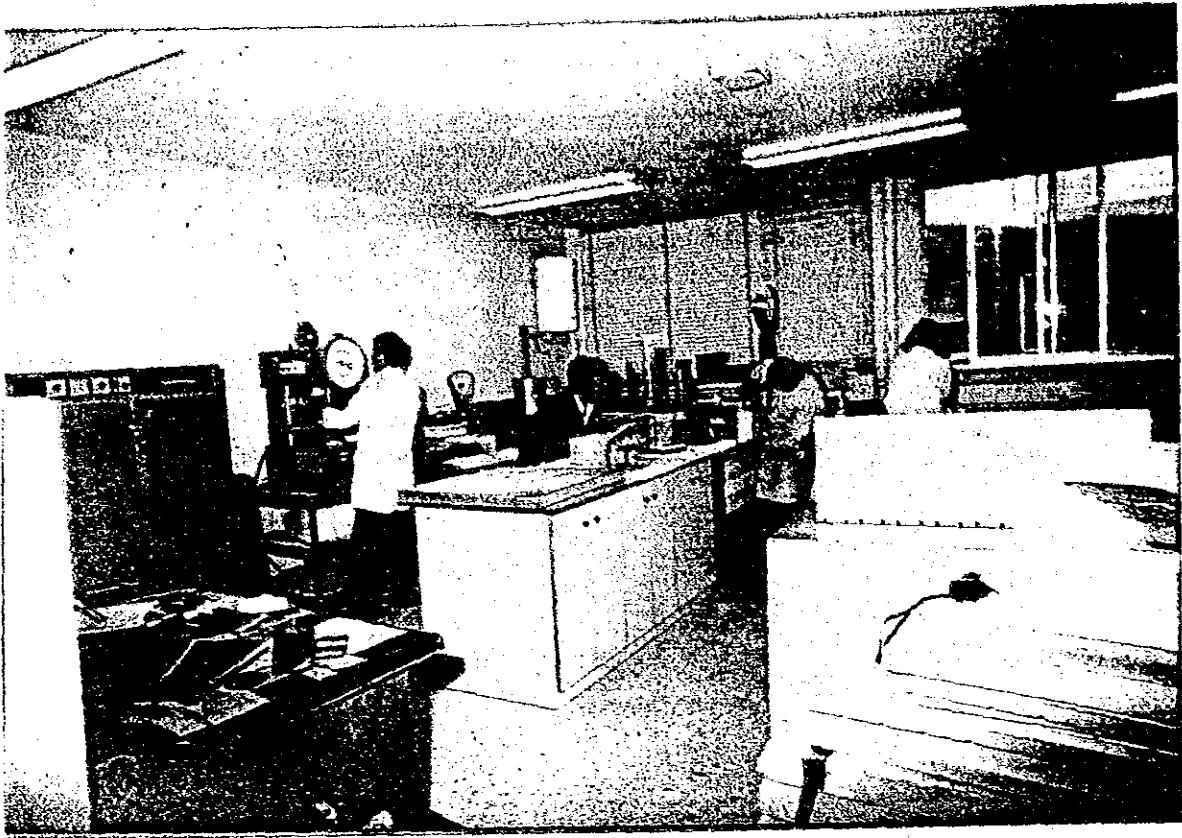
From our architectural heritage/the city of Salt

**c. Handbook of Architectural Heritage**

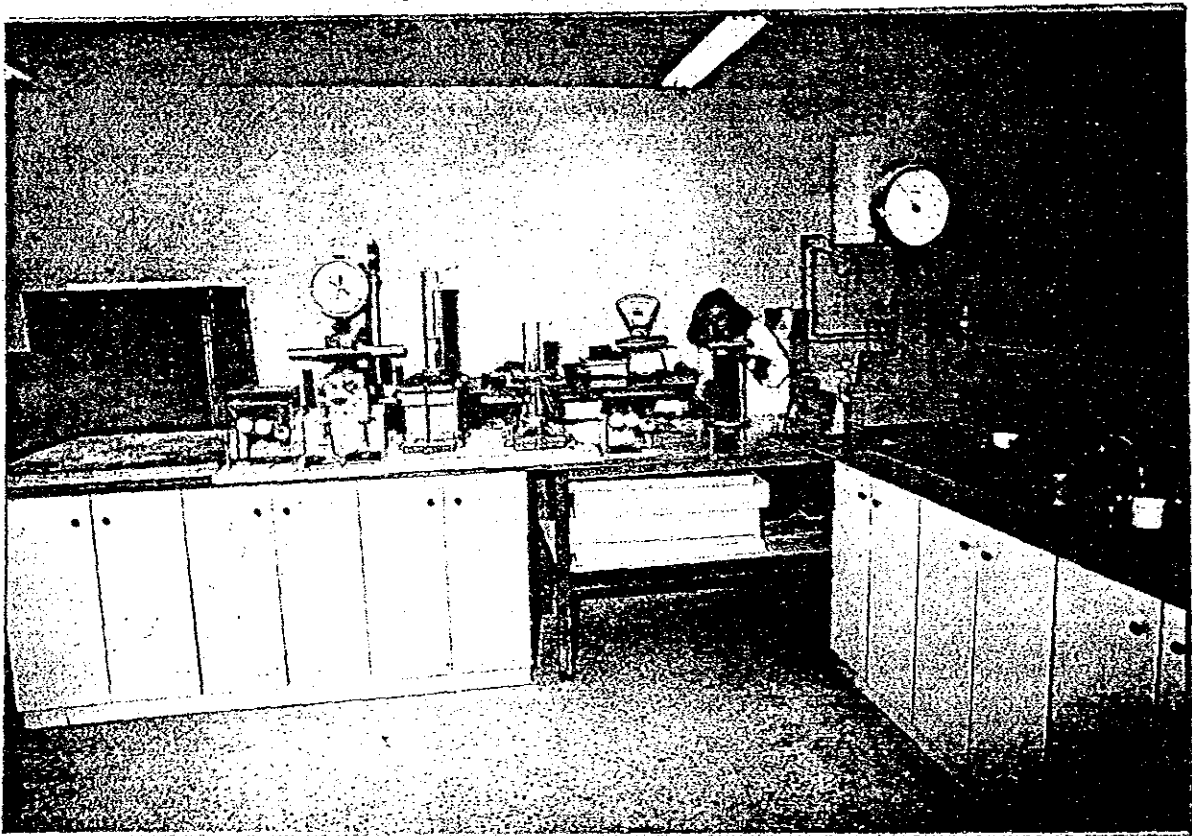
RSS is in the process of preparing a handbook on the architectural heritage of the Hashemite Kingdom of Jordan. This handbook will contain artistic, technical and historical data on such buildings, with classification and discussion.

The first phase of this project is concerned with the old buildings of Salt city. It is hoped that this project will continue, and that the buildings of other cities can also be documented.

- d.** Studies in Soil and Rock Mechanics
- e.** Research and Development on Asphalt Mixes
- f.** Testing for Physical and Chemical Properties of Cement
- g.** Research and Studies on Jordanian Aggregates
- h.** Studies and Laboratory Testing on Sewerage Pipes and Sewerage Networks
- i.** Studies and Laboratory and Field Testing on Construction Components



Testing of building components



- j. Quality Control Services for Large Projects and Locally Manufactured Concrete Products, in cooperation with the Specifications and Standards Directorate of the Ministry of Industry and Trade. The Abu Nusseir Housing Project and Yarmouk University were among the projects which benefited from these services.
- k. Calibration of Building Materials Laboratory Equipment
- l. Studies, Testing and Research and development on Tiles and Bricks, the Evaluation of Test Results and Drafting of Related Standards
- m. Preparation of a Structural Engineering Handbook on the Analysis and Design of Earthquake-Resistant Buildings
- n. Computer-Aided Structural Analysis and Design
- o. Studies and Consultation in the Field of Building Acoustics
- p. Inspection of Buildings during or after Construction to Determine Quality of Work, Identify Defects and Propose Solutions
- q. Studies, Testing and Consultation in the Field of Electromechanical Services for Buildings
- r. Drafting National Building Codes and Specifications
- s. Research and Studies in Architecture in all its Aspects



Soil testing

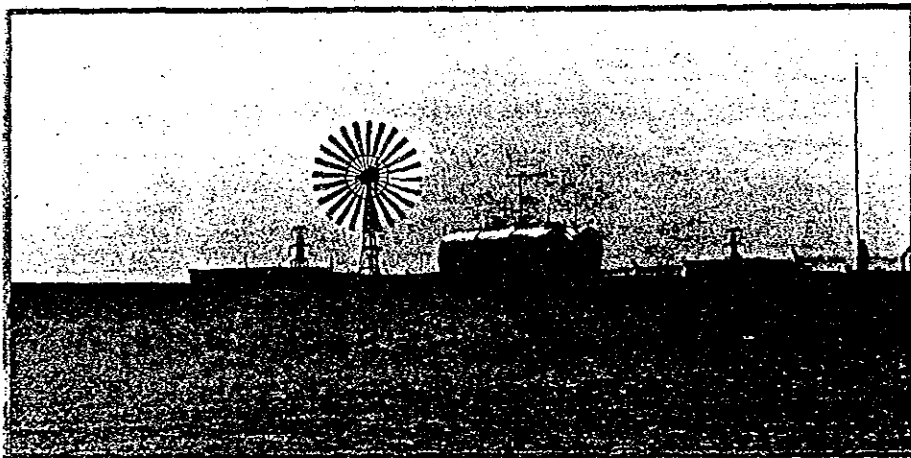
## 6. Energy

Energy has been one of the major interests of RSS ever since its foundation. With the energy issue becoming more and more important at the local, Arab and international levels, RSS has established a specialized centre for research in solar energy. Although established only a few years ago, this centre now stands high among similar Arab and international research centres.

RSS, relying on its advanced equipment and facilities, conducts applied research on the utilization of solar and wind energy, provides technical consultation, carries out distinct tests, and provides advice in the fields of energy rationalization, systems design and the execution of projects for supplying human settlements far from the electricity network with their basic energy requirements by utilizing the sources of renewable energy. Following are the main activities that RSS carries out in this field:

### a. Electrification of a Remote Village

This project aims at supplying the major sectors at Jurf El Daraweesh (a small village in the south of Jordan) with their basic energy requirements by utilizing sources of renewable energy, especially solar and wind energy. This includes lighting the streets, supplying the medical clinic, schools and houses with electricity and pumping water from a neighbouring well for drinking and irrigation. Data acquired from this project will be disseminated to the public and private sectors to be made use of when carrying out future plans for electrification of remote areas.

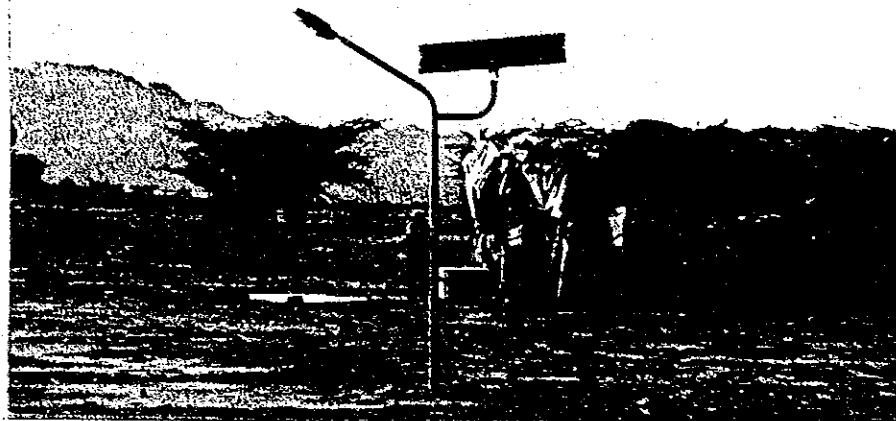


Deep - well water pumping by wind energy

### b. Photovoltaic Applications for Remote Areas

RSS studies the possibility of utilizing photovoltaic systems to generate electrical energy for the development of remote areas which are far from the electricity network and other conventional energy sources. This includes pumping water from wells, street lighting, providing telecommunication networks and medical clinics with the necessary electrical power and protecting water and oil pipes from corrosion.



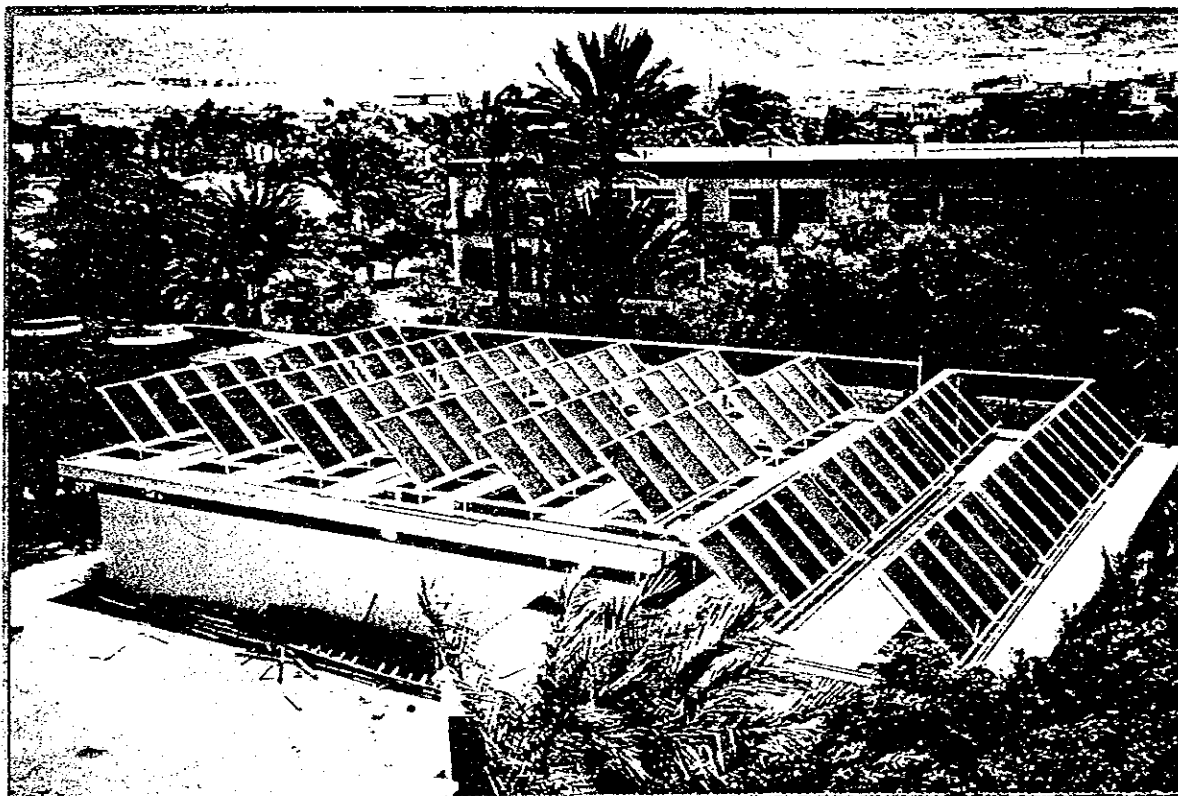


Electrification of remote areas by solar energy

**c. Development of Solar Water Heaters**

RSS works on promoting the use of solar energy in water heating for different purposes. Several advanced designs of water heaters have been made and a number of high efficiency prototypes have been manufactured at the lowest possible cost.

RSS has carried out some large projects of water heating by solar energy to meet the needs of factories and hotels and to save the consumption of traditional fuel



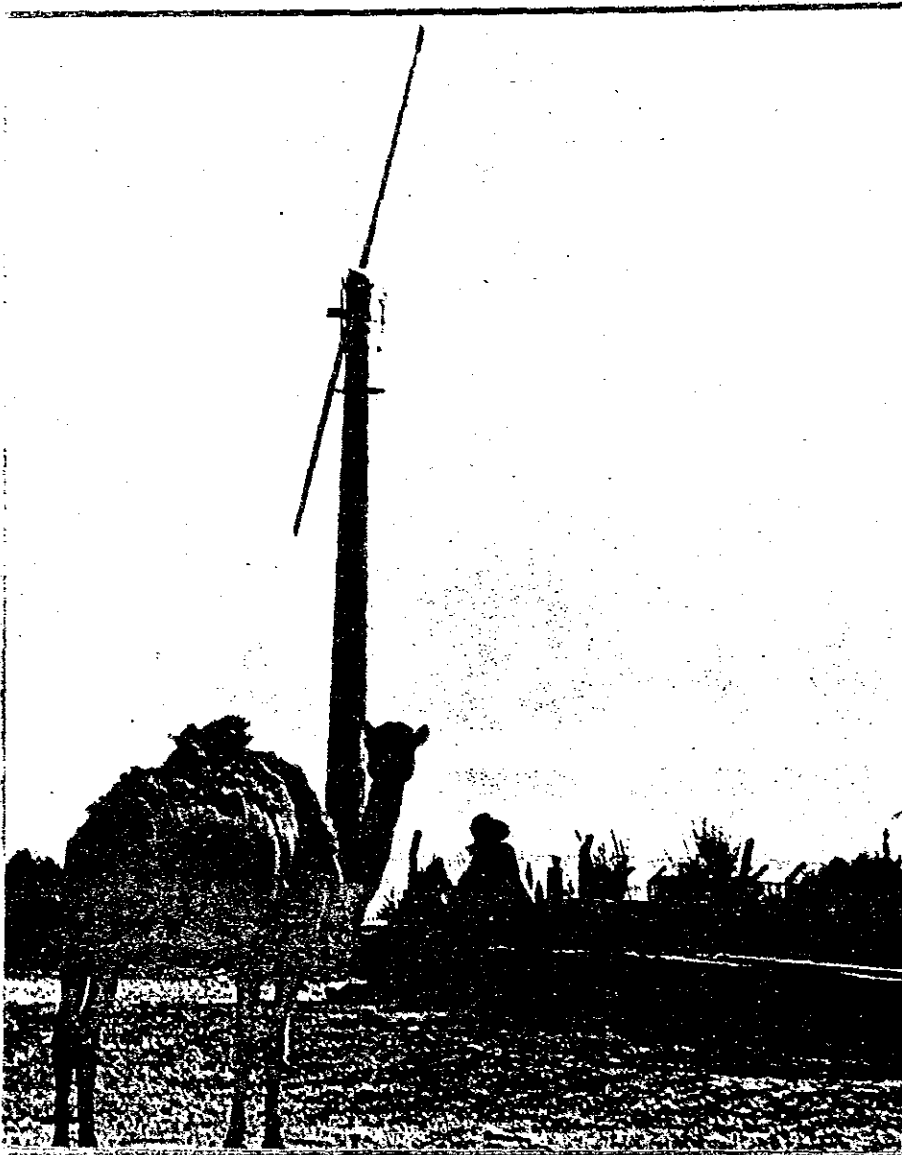
An industrial application of water heating by solar energy

**d. Development of Thermal Solar Collectors**

This project aims at setting up optimum designs for different kinds of thermal collectors in solar water heaters used for household and industrial purposes.

**e. Deep-Well Water Pumping by Wind Energy**

In this field, two water-pumping systems have been installed in Jurf El Daraweesh and Al Kharrane in the Jordan desert. These two systems pump water continuously to the people in the aforesaid areas to provide for their needs and those of their cattle. Public and private sectors can use these systems in all areas where wind energy is available. Furthermore, RSS has completed the construction of a prototype of mechanical windmill used for water-pumping with the aim of replacing imported technology in this respect.



Another application of wind energy utilization

**f. Photovoltaic Applications for Small loads**

This activity aims at supplying small loads in remote areas such as train traffic and potash harvester control systems as well as telecommunication transmitters and receivers with electrical power. Photovoltaic applications can also be used for lighting streets and operating household electrical appliances in remote areas.

**g. Testing Solar Cells**

RSS carries out different tests on samples of solar cells to check on their compliance with international specifications and capacity declared by their manufacturers and thus ensures their effectiveness and efficiency.

**h. The Solar Simulator Laboratory**

The main objective of this laboratory is to test solar collectors used in different solar applications, such as heating, cooling, air conditioning and water heating in order to identify their efficiency. The laboratory tests both locally made and imported solar collectors.

**i. Window Performance and Thermal Insulation Laboratories**

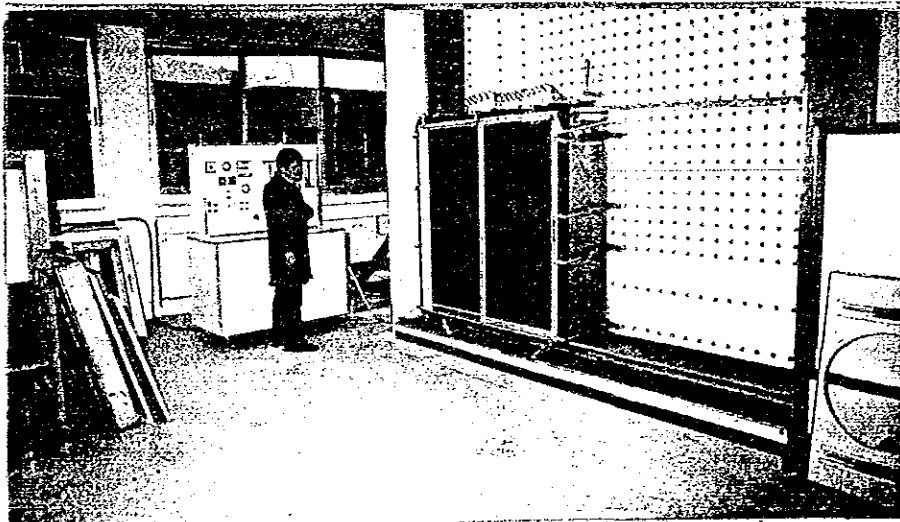
The Window Performance Laboratory tests the performance of windows in terms of air infiltration, rainwater ingress and structural strength.

The Thermal Insulation Laboratory tests both insulating materials and building materials for their thermal insulating properties as well as other physical properties.

Studies have shown that a considerable amount of energy is lost through air infiltration through windows, which increases the cost of energy for heating to a considerable extent. Window manufacturers are invited to benefit from the services of these two laboratories.

**j. Thermal Insulation Handbook**

RSS has prepared this handbook to guide building designers in the field of thermal insulation, its advantages and methods of application. Those concerned can obtain a copy of the handbook from RSS.



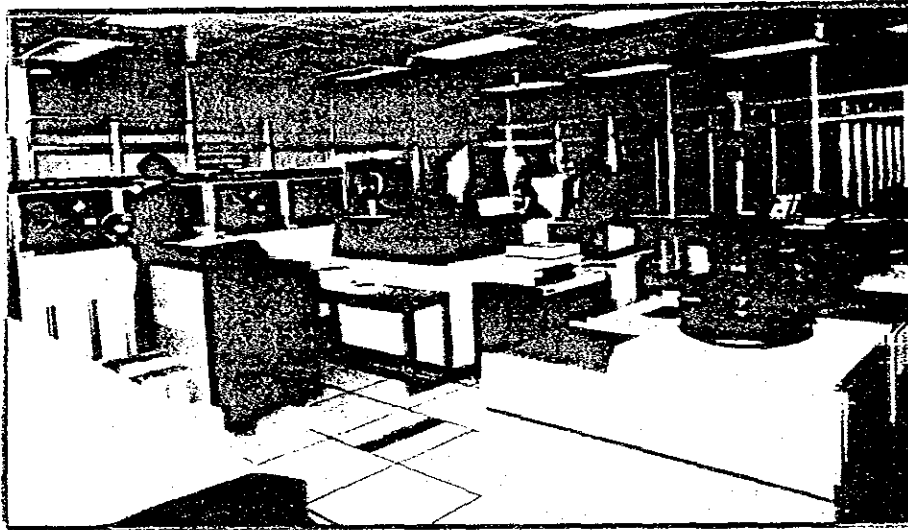
Window Performance Laboratory

## 7. Information and Computer Applications

RSS was one of the first Jordanian institutions to use computers in running its activities and in rendering services to others. At present, RSS renders technical services and consultations, conducts studies in the field of computers and contributes to introducing computer technology and applications to institutions in the public and private sectors inside and outside Jordan. This is done in different ways including contribution to specifications drafting, participation in tender committees, designing programmes and conducting training. RSS activities in this field cover about thirty ongoing projects rendering technical services to about twenty institutions. The following are the main activities of RSS in this sector:

### a. Providing Scientific and Technological Data

RSS is the authorized centre of scientific and technological information in Jordan. It coordinates and manages data and provides all relevant decisionmakers and researchers with them. Hence, RSS has become the scientific and technical arm of the National Information System. All those who are concerned, in either the public or private sector, may use this system to get required scientific and technical information.



RSS computer system

### b. Technical Studies and Consultations

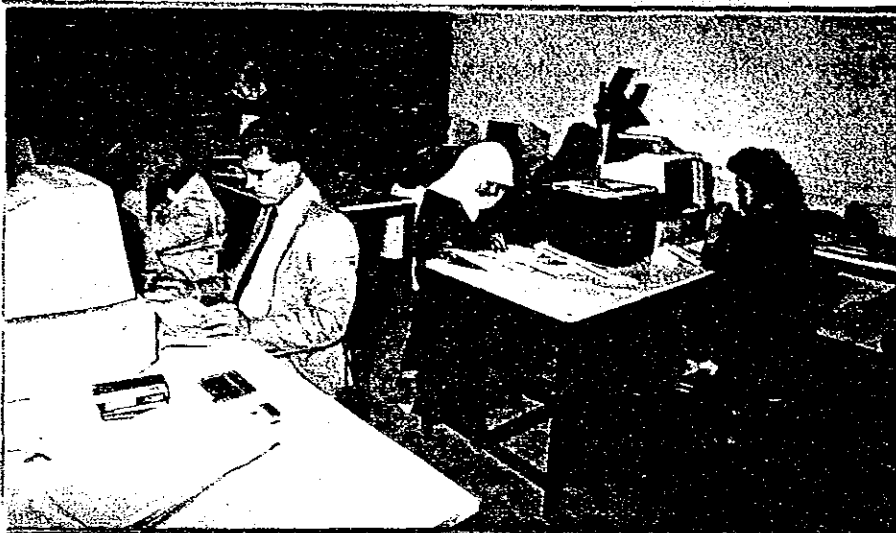
RSS carries out technical studies and consultations for the establishment of integrated information systems and prepares technical specifications to set up computer centres. In addition, RSS may supervise the operations of these centres and provide them with necessary technical advice.

**c. Scientific and Administrative Applications**

RSS designs, programmes, and develops applied systems for various institutions. It also conducts applied research and development in the field of computer applications. Some examples of these activities are the study conducted to establish a computer system and organize the estate alphabetical index for the Department of Lands and Survey and the study run to establish a socio-economic data bank in the Jordan valley, in addition to supervising the operations of this bank.

**d. Manpower Training and Development In the Computer Field**

RSS conducts specialized training programmes in the field of computers and their applications as a service to local and Arab institutions to help them develop their manpower working in this field. Moreover, RSS runs Princess Sumaya College for Informatics, which is a community college that teaches computer courses leading to the diploma in programming and systems analysis.



Practical training at Princess Sumaya College for Informatics

## **8. Agriculture and Food**

RSS activity in this field is centred around the following:

- a. Conducting applied studies and research in the field of food and feedstuffs regarding their nutritive value, chemical additives and preservatives, and harmful materials they may contain
- b. Conducting studies and research concerning toxic and dangerous materials which may be found in some consumer goods, especially foodstuffs

- c. Carrying out tests on imported foodstuffs, especially meat and dairy products, to ensure that they are free from radiation.

## **9. Manpower Development**

The importance of intermediate and advanced technological training has emerged in consequence of technological developments achieved during the last twenty-five years, which required a new type of experienced technician. Hence, the training system at present faces a considerable challenge of setting up specialized training programmes devoted to providing highly qualified technicians and more of them. Modern specialized training, whether technical or otherwise, contributes effectively to technology transfer, since most modern technical equipment represents scientific systems which consist of different technological elements. The user ought to familiarize himself with these in order to operate easily the equipment, maintain it and solve its problems when they occur.

Taking this into consideration, RSS concentrates on highly specialized technological training which depends on the modern approach in respect of subject, style and method of execution.

To put all this into practice, RSS has established a specialized training unit to function within the context of the following principles:

- To contribute to relating specialized technological training to industry
- To formulate training programmes that respond to the needs of manpower and labour market, in cooperation with relevant public and private institutions in Jordan and the other Arab countries
- To produce training and educational packages for advanced fields in accordance with the latest technological systems
- To train in new and advanced technologies.

Most prominent among the training fields which RSS concentrates upon are the following:

### **a. Specialized Top Management**

- Industrial Management
- Information Systems and Data Bank Management
- Project Management
- Management of Negotiation, Contracts and Contract Formulation

### **b. Engineering and Industrial Design**

Training in this field aims at building up a local technological capability to decrease the country's dependence on imported technology and its products.

### **c. Maintenance of Electronic Equipment**

### **d. Advanced Technology and the latest Developments in this Field**

### **e. Other Technical Specializations in the Fields of Energy, Building, Industrial Chemistry, Mechanical Engineering and Computer Applications.**

## **Laboratories and Specialized Units**

RSS comprises the following thirty-four laboratories and eleven specialized units which carry out tests, analyses, research and studies, and provide services in the fields of their specialties:

**a. In the Field of Electrical and Electronic Engineering**

1. Research and Development Laboratory
2. Testing and Quality Control Laboratory
3. Maintenance and Repair Laboratory
4. Standards and Calibration Laboratory

**b. In the Field of Chemical Industries**

1. Microbiology Laboratory
2. Paints and Lacquers Laboratory
3. Fuels and Lubricants Laboratory
4. Glass and Ceramics Laboratory
5. Chromatography Laboratory
6. Organic Chemistry Laboratory
7. Inorganic Chemistry Laboratory
8. Chemical Analysis Laboratory

**c. In the Field of Mechanical Industries**

1. Metallography Laboratory
2. Non-Destructive Testing Laboratory
3. Strength of Materials Laboratory
4. Plastics and Rubber Laboratory
5. Measurement and Calibration Laboratory
6. Batteries Laboratory
7. Paper, Textile, and Leather Laboratory
8. Radiation Protection Laboratory
9. Mechanical Workshop

**d. In the Field of Environment**

1. Water Pollution Laboratory
2. Air Pollution Laboratory

**e. In the Field of Construction**

1. Raw Building Materials Laboratory
2. Cement and Concrete Laboratory
3. Soil Mechanics Laboratory
4. Building Components Laboratory
5. Roads Laboratory

6. Geophysics Laboratory
7. Window Performance Laboratory
8. Thermal Insulation Laboratory
9. Building Accoustics Laboratory
10. Quality Control Laboratory
11. Yarmouk Quality Control Laboratory (Irbid)
12. Electro-Mechanical Services Unit
13. Consulting Services Unit
14. Specifications Unit
15. Codes of Practice Unit
16. Architecture Unit-Model Making Workshop
17. Earthquake-Resistant Structures Unit
18. Maintenance Workshop for Building Materials Laboratory Equipment

**f. In the field of Energy**

1. Solar Simulator Laboratory
2. Wind Energy Experimental Station (Al Kharrane)
3. Wind Energy Experimental Station (Jurf El Daraweesh)
4. Solar Cells Testing Station (Aqaba)



## Statistics

Year	Revenues (in JD)	Capital and Recurrent Expenditures (in JD)
1980	3,885,447	1,801,163
1981	2,092,394	2,112,797
1982	2,231,450	2,842,163
1983	2,201,300	3,298,271
1984	2,716,136	2,681,622
1985	4,333,878	3,935,191
1986	3,189,467	3,256,340

### RSS budget (revenues and expenditures from 1980 to 1986)

Year	Value in JD
1980	2,396,899
1981	2,483,249
1982	2,719,809
1983	2,947,201
1984	3,161,474
1985	3,476,856
1986	3,840,282

### Development of RSS machinery and equipment

Date	Number
31/12/1980	408
31/12/1981	430
31/12/1982	473
31/12/1983	491
31/12/1984	461
31/12/1985	463
31/12/1986	465

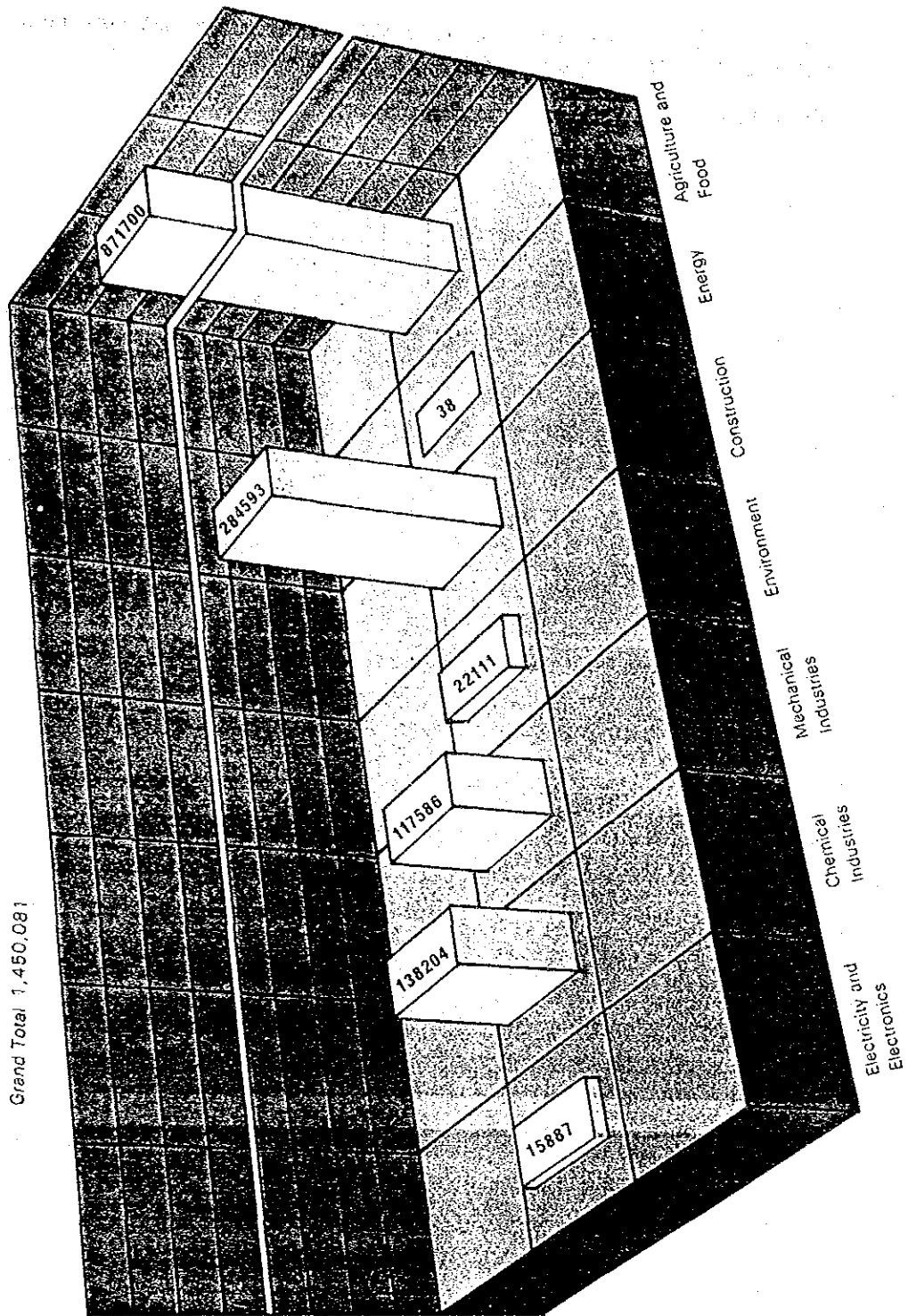
### Number of RSS employees from 1980 to 1986

Degree or Certificate	Number
Ph.D	34
M.A/M.Sc	45
Diploma	26
B.A/B.Sc	94
Assistant Engineer	09
Community College	62
General Secondary Certificate	55
Others	140

**Qualifications of RSS employees as on December 31, 1986**

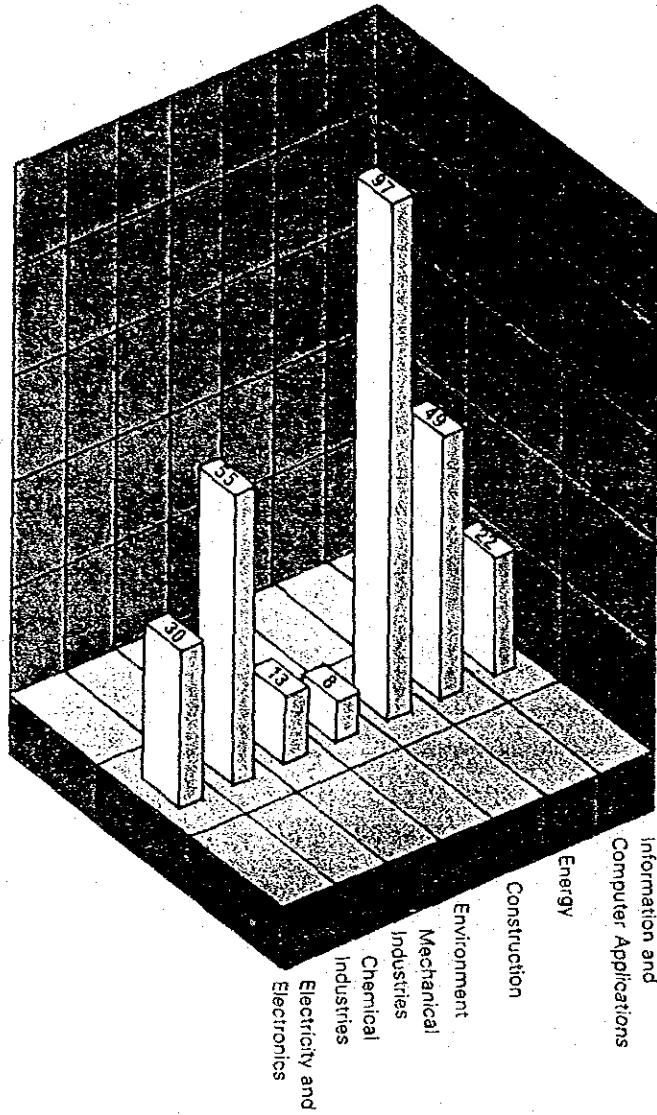
**Total of tests carried out by RSS during the years 1980-1986 according to fields of competence**

Grand Total 1,450,081



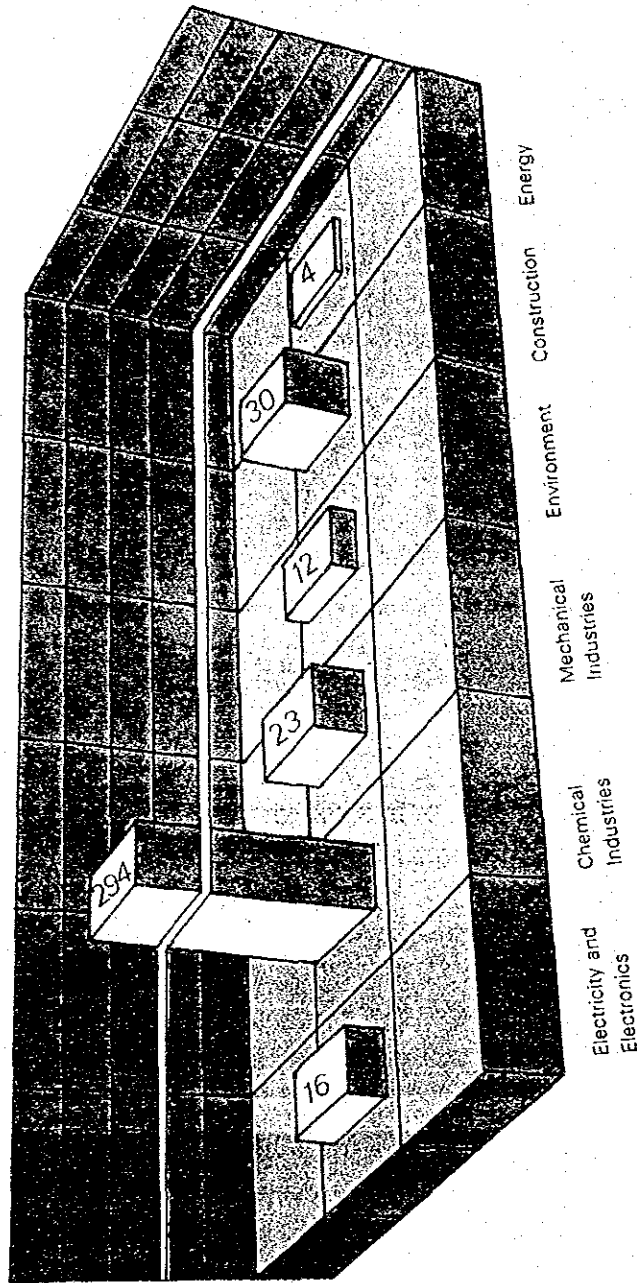
**Number of research and development projects carried out by RSS during the years 1980-1986, according to fields of competence**

Grand Total = 274

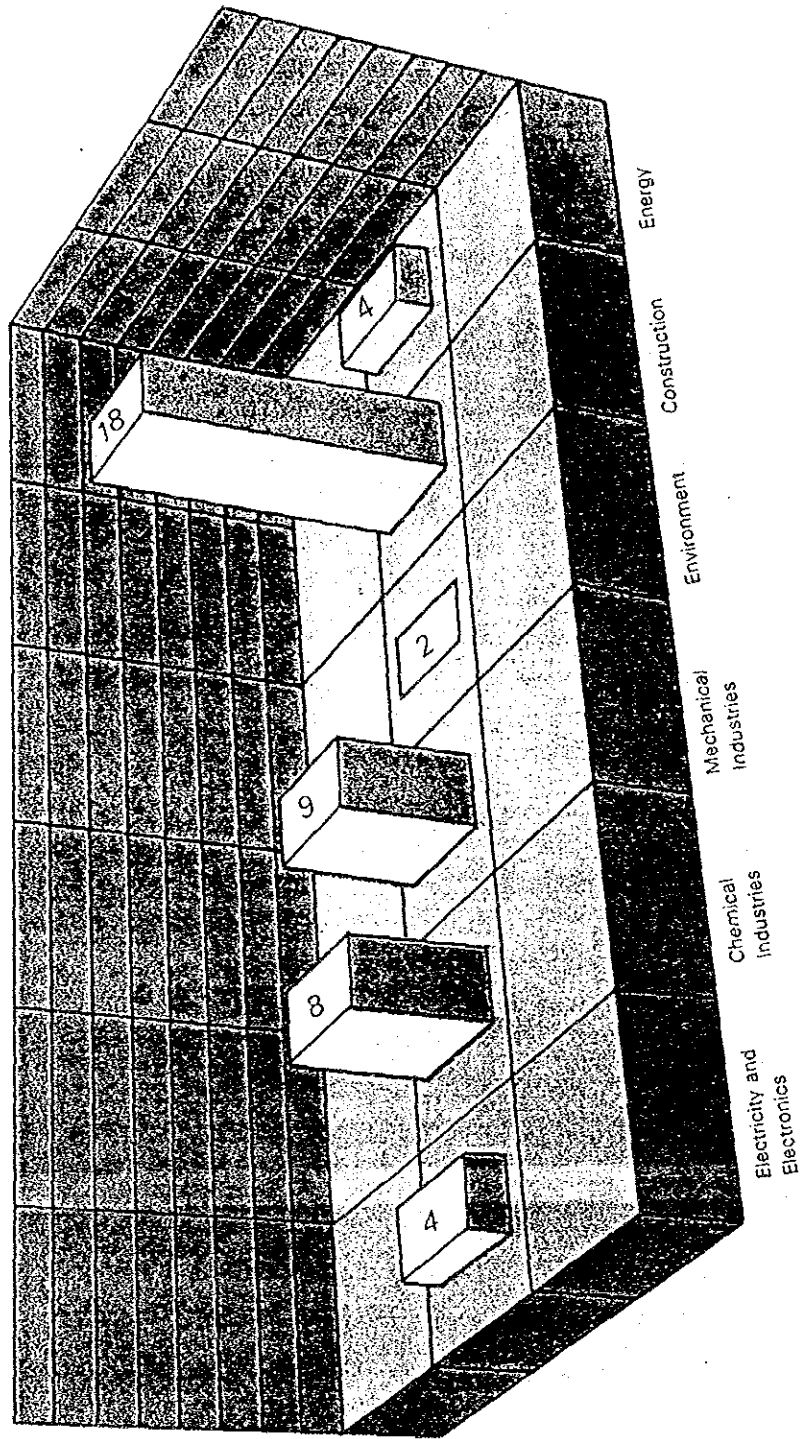


**Number of specifications in which RSS participated during the years 1980-1986, according to fields of competence**

Grand Total = 379

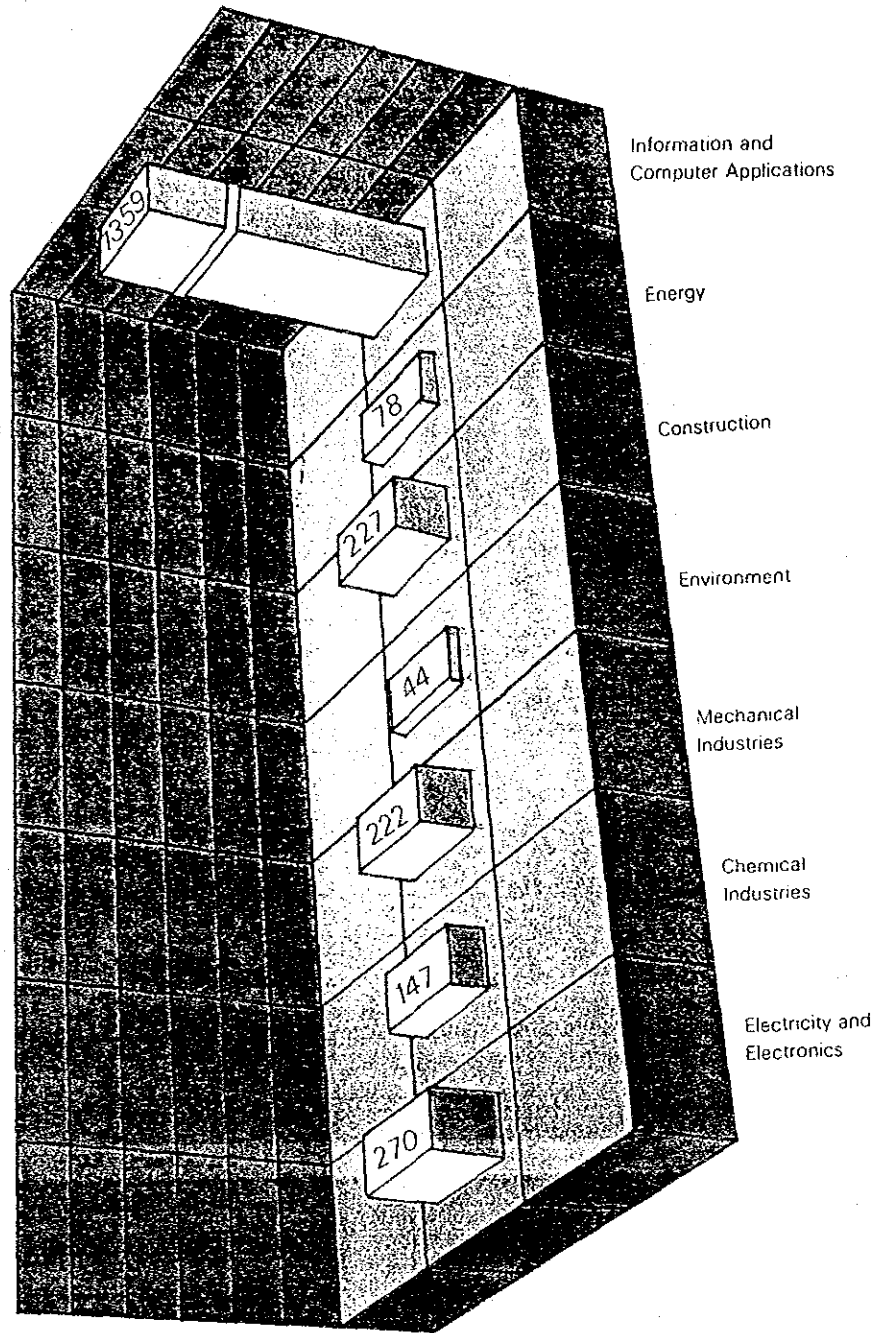


Number of RSS laboratories and specialized units  
Grand Total = 45



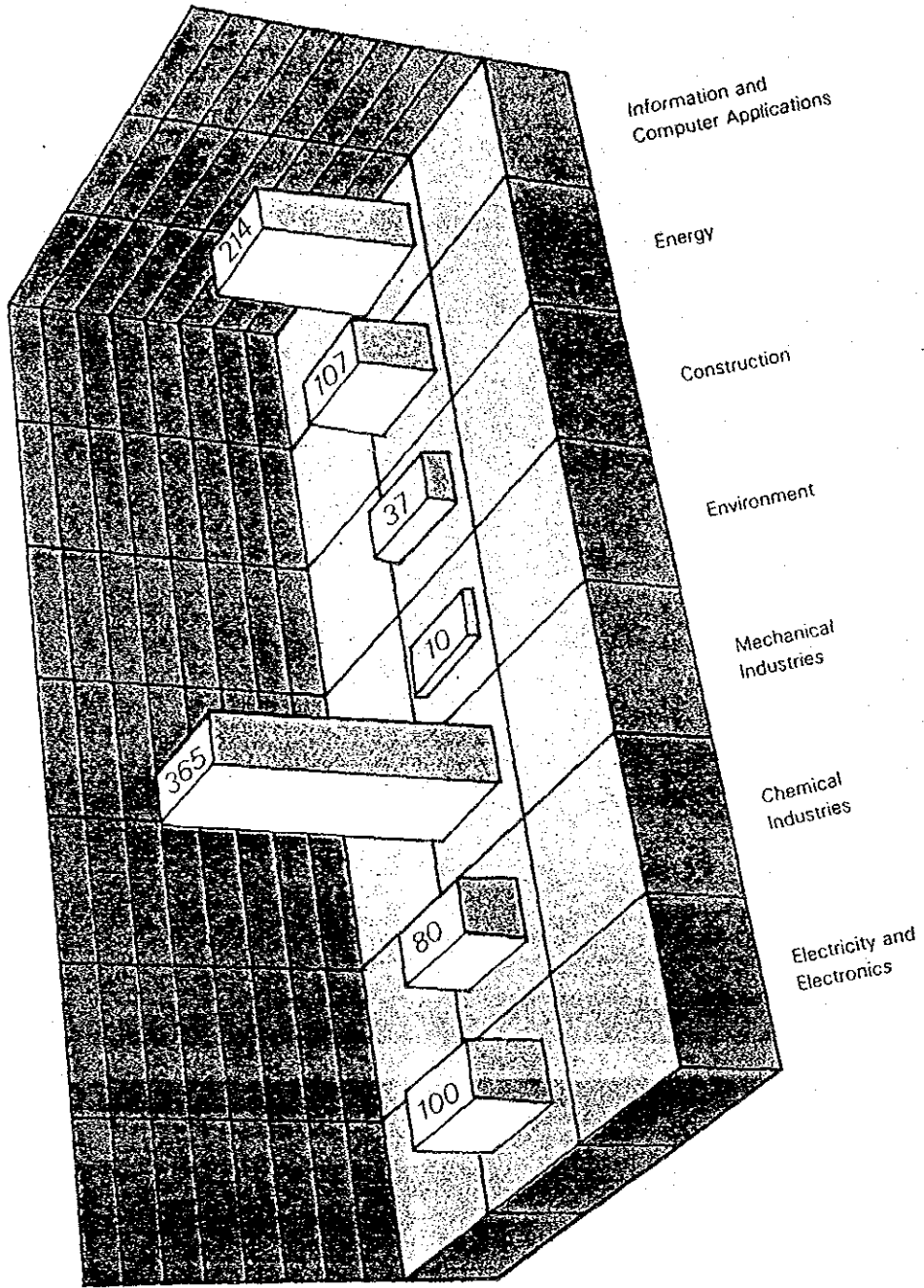
Number of technicians trained by RSS during the years 1980-1986  
according to fields of competence

Grand Total = 2,347



Number of trainees during the years 1980-1986, according to fields of competence

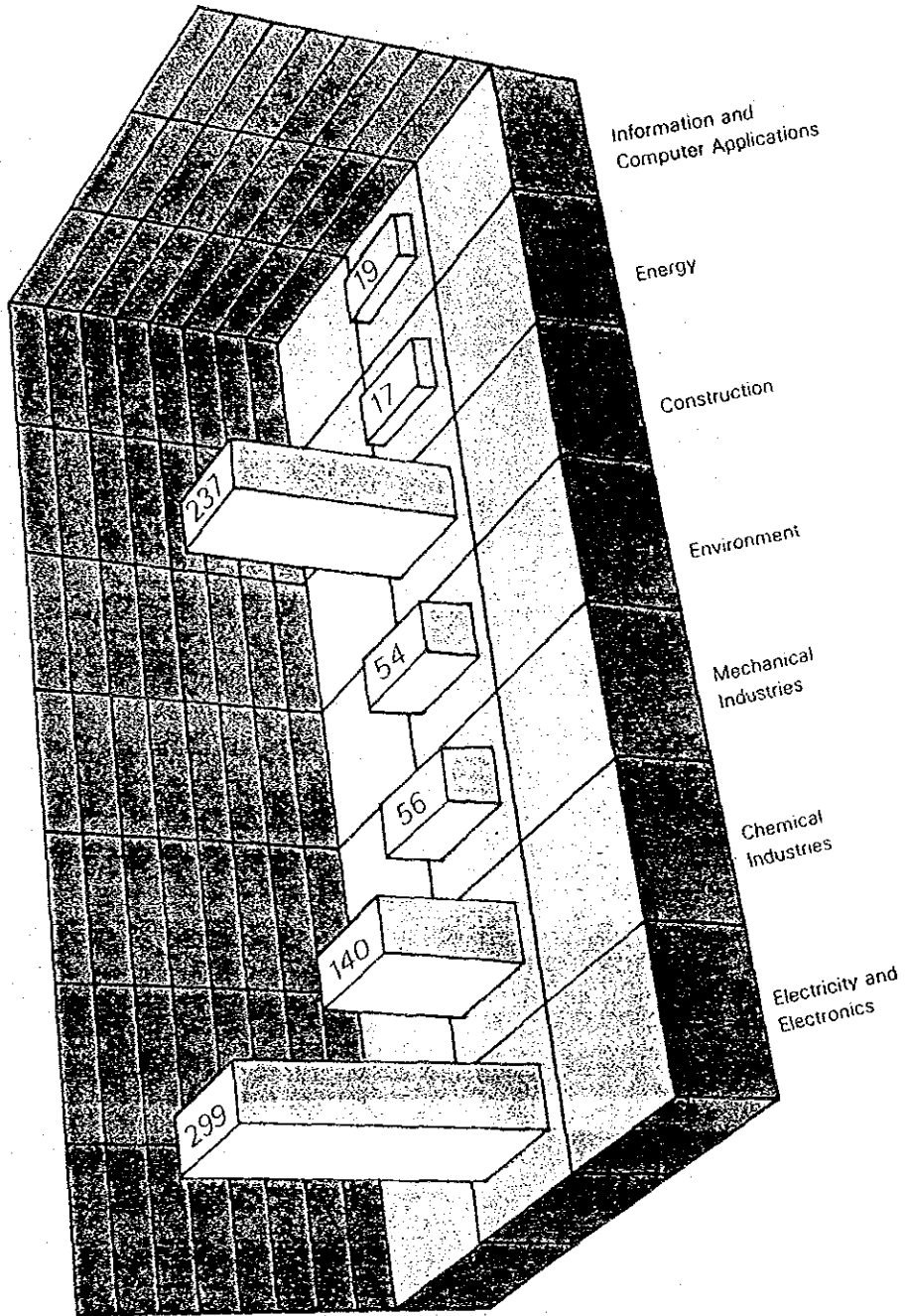
Grand Total = 913





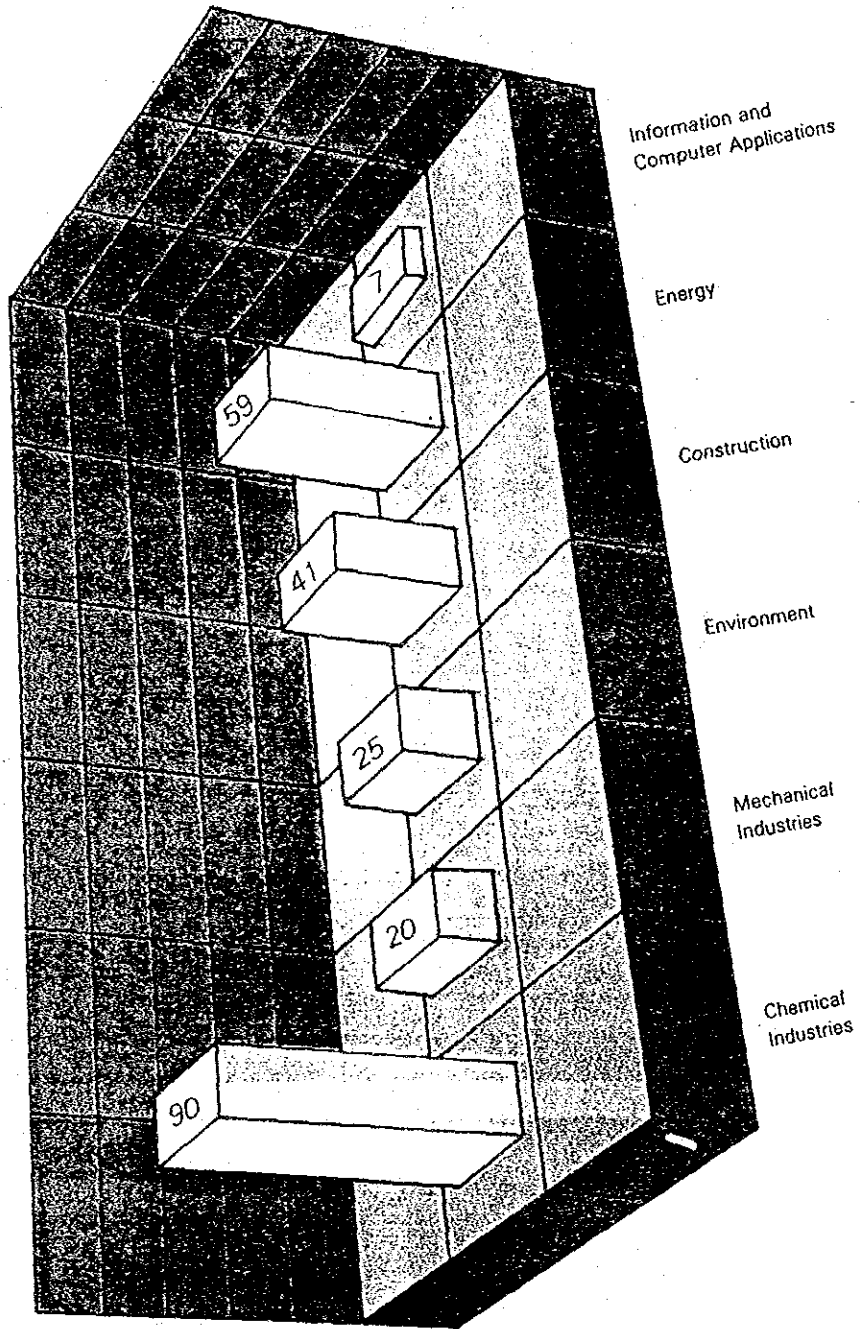
Number of consultations provided by RSS during the years 1980-1986, according to fields of competence

Grand Total = 822



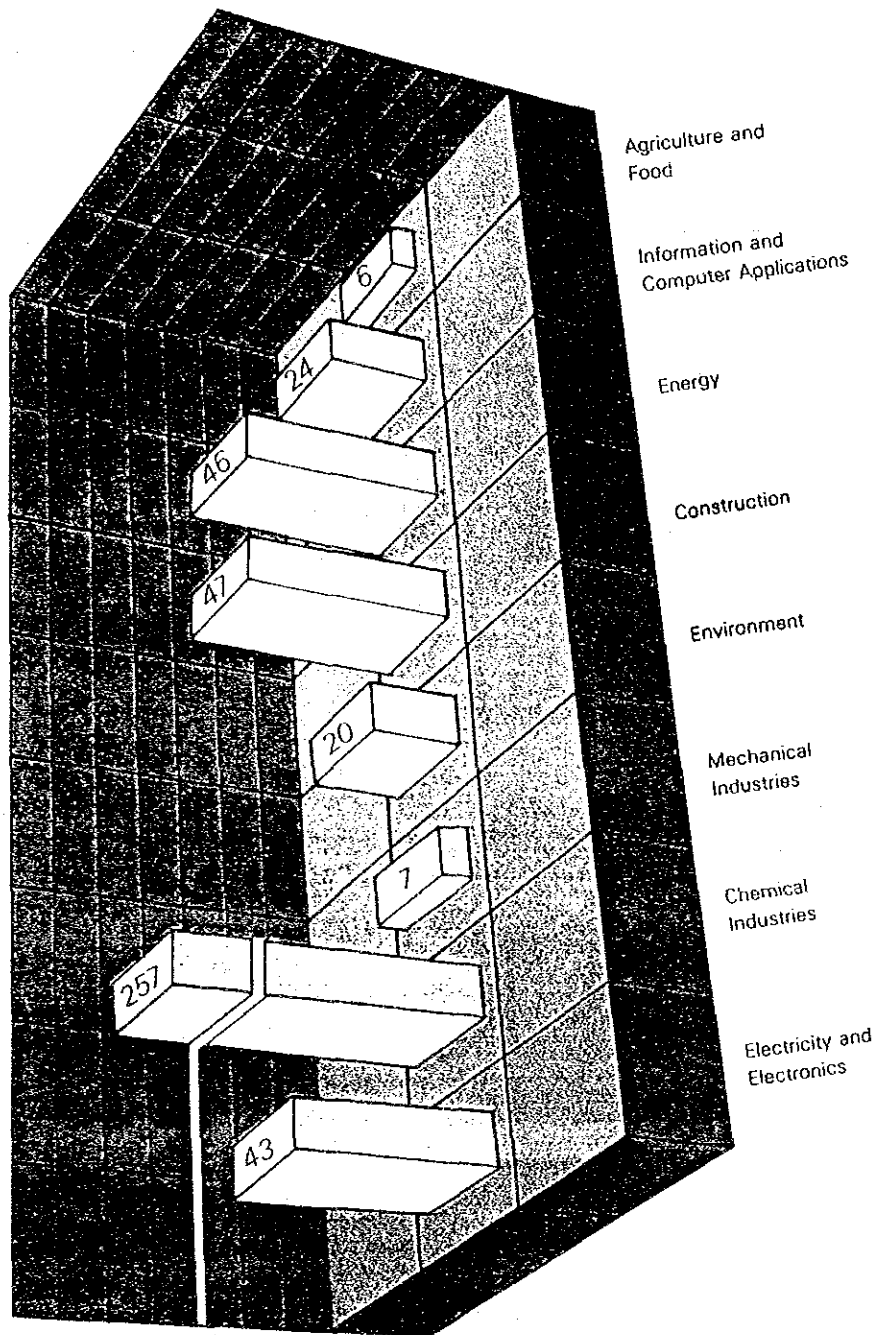
Number of scientific seminars and conferences organized by RSS during the years 1980-1986, according to fields of competence

Grand Total = 242



Number of studies conducted by RSS during the years 1980-1986, according to fields of competence

Grand Total = 450



5. R S S 年次報告(1987年度)

# **ANNUAL REPORT**

# **1987**

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**ROYAL SCIENTIFIC SOCIETY**

# Royal Scientific Society Annual Report 1987

## **RSS Board of Trustees\*:**

- |   |                |
|---|----------------|
| 1 . His Royal Highness Crown Prince El-Hassan Bin Talal | President      |
| 2 . H.E. Dr. Khalil El-Salem                            | Vice President |
| 3 . H.E. Minister of Industry and Trade                 |                |
| 4 . H.E. Minister of Planning                           |                |
| 5 . H.E. President of the Royal Scientific Society      |                |
| 6 . H.E. Chairman of the Jordan Valley Authority        |                |
| 8 . H.E. Dr. Adnan Badran                               |                |
| 9 . H.E. Dr. Subhi El-Qasem                             |                |
| 10. H.E. Chairman of Amman Chamber of Industry          |                |
| 11. H.E. Dr. Ahmad Al-Galabi                            |                |

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\* As from October 17, 1987, the Royal Scientific Society became one of the research centres attached to the then established Higher Council for Science and Technology and the powers and responsibilities of RSS Board of Trustees were assumed by this Council.

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## Introduction

### Science and Technology in Jordan

This century is characterized by a revolution in science and technology and a rapid and tremendous technological development which has become a distinctive feature of the life of modern societies.

Despite its limited natural resources, Jordan has succeeded in educating and training its citizens and has been, since the early 1980s, concentrating more on investment in human resources, which relies on science and technology as a basis for the comprehensive development process, in order that Jordan become a centre of excellence for scientific and technological services in the Arab region. Fortunately, a deep look at the demographical map and the main characteristics of the people of Jordan would show that the opportunity for this country to play this outstanding role is available.

In its previous development plans, Jordan adopted an approach for economic growth that mainly based on developing the normal social and economic activities in the various sectors of production of goods and services through focussing on capital, labour and land rather than on science and technology with a specified separate policy which leads to scientific and technological progress, which, in turn, will lead to progress in all social and economic fields. This approach stemmed from the perception that the desired progress implicitly comes as a result of that very approach through successive social and economic plans.

Historically, a committee for scientific research was established in Jordan in 1960 through the encouragement of UNESCO. This committee was reorganized in 1961 and called The Scientific Research Council. This Council was reorganized in 1963 to include more members. In 1964, the Council was reorganized again through a special bye-law which remained in force until 1972 when it was replaced by a law that, again, reorganized the Council. Then in 1976 another law was passed to abolish the Council.

In 1978 an International Conference on Science and Technology Policy for Jordan was held in Amman. As a result of this Conference a committee was formed to study and propose the suitable organization for drawing up a national policy for science and technology. This committee proposed that the National Planning Council be reorganized. Accordingly, The Directorate of Science and Technology was created within the Council. In 1984 the Ministry of Planning was established

to replace the National Planning Council and then the Department of Statistics was attached to it in 1985.

Those organizations provided some scientific research activities with a modest support, but they did not draw up a national policy or plan for science and technology in Jordan. The annual spending rate on research and development was 0.15% of GNP during the years 1980-1985.

In its latest socio-economic development plan (1986-1990), Jordan started to consider science and technology as a basic sector in the development process. "Convinced of the necessity to develop the Kingdom as a centre of excellence for services based on science and technology and for human resources in the Arab region through a better utilization and promotion of national potential in science and technology to enable this sector to play the envisaged pilot role in the overall national development," ... "emphasizing what has been stated in the consecutive development plans in this regard, and taking into consideration the tendency of this sector to realize the concept of a national science and technology institution as one of its principal objectives in the five-year development plan of 1986-1990", the government of Jordan formed the National Committee for Science and Technology Policy in 1986 to "propose the appropriate national organization for science and technology that could identify priorities and programmes as well as ways for their finance and follow up. This proposition should rely on conducting survey, analysis and evaluation of local and external research and scientific quality centres, specifying opportunities for transfer of technology in the public and private institutions in addition to any other studies the Committee would deem necessary." Upon the recommendations of this Committee, "The Higher Council for Science and Technology" was established in September 1987 under the chairmanship of His Royal Highness Crown Prince El-Hassan with six ministers, six representatives of different institutions active in the field of science and technology including the president of the Royal Scientific Society, and a secretary general as members.

The Council is a legal entity which enjoys administrative and financial independence, has a permanent secretariat headed by a secretary general and is entitled to establish specialized scientific and technological research centres to be attached to it. The law of the Council stated its objective as "to build, sponsor and develop a national science and technology foundation for the purpose of realizing the goals of the Kingdom's economic, social and cultural development". In fulfillment of this objective, the law provided for the Council to exercise the following powers and responsibilities:

- a - To ratify the general policy of science and technology in the Kingdom and to define its priorities, draw programmes and plans arising therefrom and to follow up its implementation and evaluation.
- b - To draw a strategy suitable for the development of scientific and technological potential in the Kingdom and to prepare for the required suitable environment.
- c - To support institutions and units of scientific and technological research and to provide funding required for upholding scientific and technological research as well as scientific and technological services and activities in the Kingdom.