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ESTABLISHMENT OF THE ARAB REGIONAL PACKAGING CENTRE

DP/RAB/83/020

Technical report: Study on identification of focal points,  
technological institutions and needs of technical assistance\*

Prepared for the Arab Industrial Development Organization  
by the United Nations Industrial Development Organization  
acting as executing agency for the United Nations Development Programme

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United Nations Industrial Development Organization  
Vienna

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PLACES VISITED

<u>PLACE AND COUNTRY</u>	<u>DATES</u>	<u>PURPOSE</u>
1. BAGHDAD IRAQ	Sept.8 - Oct.8, 1986	CTA duties
2. CASABLANCA MOROCCO	Oct.9 - Oct.13, 1986	CTA duties
3. ALGER ALGERIA	Oct.14 - Oct.19, 1986	Survey
4. TUNIS TUNISIA	Oct.20 - Oct. 23, 1986	-Do-
5. BAGHDAD IRAQ	Oct.24 - Nov. 7, 1986	-Do-
6. CAIRO EGYPT	Nov.8 - Nov. 14, 1986	-Do-
7. MOGADISCIO SOMALIA	Nov.15 - Nov. 19, 1986	-Do-
8. KHARTOUM SUDAN	Nov.20 - Nov. 25, 1986	-Do-
9. RIYADH S.ARABIA	Nov.27 - Nov. 30, 1986	-Do-
10. JEDDAH S.ARABIA	Dec.1 - Dec.3, 1986	-Do-
11. CASABLANCA MOROCCO	Dec.9 - Jan.24, 1987	CTA duties
12. TRIPOLI LIBYA	Jan.25 - Jan30, 1987	Survey
13. DAMASCUS SYRIA	Jan.31 - Feb.4, 1987	-Do-
14. AMMAN JORDAN	Feb.5 - Feb.8, 1987	-Do-
15. BAGHDAD IRAQ	Feb.9 - Feb.15, 1987*	-Do-
16. MANAMA/BAHRAIN	Feb.22 - Feb.25, 1987	-Do-
17. SANAA/YEMEN A.R.	Feb.26 - March 4, 1987	-Do-
18. CASABLANCA/MOROCCO	March5 - March 25, 1987*	CTA duties
19. UNIDO/VIENNA	March26-April 18, 1987**	

\* Leave taken: Feb. 16 - 21 and March 7 - 10

\*\* Final writing of survey visits report, terminal report and draft project concepts for possible follow-up of the project.



## 1.0 INTRODUCTION

The nature of the Arab Packaging industries has been the subject of anxiety and concern of the national authorities in many a country of the region. By and large, the industries both in the state managed sector as well as in the private sector face a number of inadequacies such as:

- (i) limited trained and up to date expertise
- (ii) insufficient concern for planned maintenance and 'in process' quality control
- (iii) near absence of packaging infrastructural facilities
- (iv) limited awareness of advances made in the science and technology of packaging
- (v) insufficient expertise to formulate packaging standards
- (vi) absence of packaging research and development related to the needs of the countries|region, etc.

1.1 The need to identify, promote and develop well functioning focal points at the national level forms an important link designed to connect components of international assistance to local resources. Not only the focal points are vital parts of the regional communication network but could be a forceful medium to help create great production capabilities and guide the flow of technical assistance to the appropriate beneficiary groups. The packaging industries frequently need direct links with research and development institutions to develop techniques and processes for local adaptation, testing and developing indigenous know-how, formulation and introduction of standards, quality control and metrology, sealing-down of imported packaging materials, studying the use of locally available raw materials for use in the packaging industries, developing processes and manufacturing prototypes. A critical area is the need to identify R & D institutions already available in the Arab countries, which could be appropriate and relevant to raising of packaging technology and standards in the respective countries and in the region as a whole. Accordingly, the study was extended to identify such resources and unfold the manner of upgrading their expertise and facilities as to serve the

packaging interests.

1.2 The application of science and technology of packaging is a means to end. It is necessary to integrate science and technology with the urgent needs of the Arab countries. A concerted effort was made to demarcate the demand segments where packaging knowledge can be applied realistically and more efficiently to upgrade national capabilities in each of the country.

Within the context of the above considerations, field studies were undertaken in thirteen countries of the region viz Iraq, Algeria, Tunisia, Morocco, Egypt, Somalia, Sudan, Saudi Arabia, Libya, Syria, Jordan, Bahrain and the Yemen Arab Republic. The selection of these countries was primarily based on considerations of completing the work within the remaining life span of the project. The main findings and recommendations for further action are set out for different countries separately.

1.3 In the completion of this work, a number of organisations, government departments, members of trade and industry and host of other members of the packaging fraternity cooperated. Their contributions and instant response are thankfully acknowledged. The consultant expresses his gratitude to Mr. S. Bourjini, Chief, Regional Bureau for Arab States, UNDP/New York, for his foresight in identification of the need for this study. The help and assistance provided by the UNDP's Resident Representatives in the respective countries and the members of the staff which enabled the consultant to have ready support and access to a number of respondents in a short period of 3 to 5 days in each country is deeply appreciated. Mr. Adnan Al-Kindi, Director, and Mr. Hamid Al-Judi, Co-ordinator Packaging Unit of the Arab Industrial Development Organisation, and Mr. ZAKI Ali, Director General IMEC, and Mr. M. Hammi were good enough to add to the efforts of the consultant in the preparatory work, their contributions are gratefully acknowledged. Last but not the least, thanks are due to Mr. J. Belo, Industrial Development Officer UNIDO for all the backstopping support, timely response to requests made for logistic facilities and contributions in the preparatory work for the study.

24th MARCH 1987

R.K. CHOWDHARY

CHIEF TECHNICAL ADVISOR

2.0 ALGERIA

ALGER

2.1 FOCAL POINTS

Realisation of the need to bring about a major change in the quality standards of the products manufactured by the packaging industry in Algeria and to effect a technological upgradation of the industry, have brought to focus the necessity of a centralised framework related to packaging. Accordingly, the Ministry of Commerce, Department of Regulations and Normalisation has been entrusted with the role to plan and coordinate strategies for the development of the packaging industries in Algeria. An inter-ministerial commission with a high level representation each from the Ministries of Petro Chemical, Heavy Industry and Light Industries and Commerce has been constituted and is functioning under the leadership of the Ministry of Commerce since Feb 1986. Till further advice, the Ministry of Commerce, Department of Regulation & Normalisation Alger is the national focal point endowed with the responsibilities, among other things, of developing national capabilities, creation of an institutional mechanism and formulation of policies and programmes appropriate to country's resources and raw materials for the packaging industries. The ministry plans to evolve strategies aimed at selected and mutually reinforcing systems of production, quality upgradation, capable of influencing producers of raw materials, packaging manufacturers, users and consumers. The consultant highlighted in concrete terms certain areas where the focal points could act immediately and made available a guideline on the subject drafted in Arabic at AIDO's Hq.

2.2 The commission is being assisted by three sub committees one each in the areas of paper, board & glass bottles, plastics, metals and is contemplating to form another sub committee on "Packaging design particularly graphic art".

3.0 SURVEY OF TECHNOLOGICAL INSTITUTIONS

3.1 Discussions with the authorities revealed that the national interests for packaging could best be served by the establishment of a packaging centre rather than upgradation of an existing institute.

Based on the recommendations of a study by the International Trade Centre, the Ministry of Commerce proposes to set up an 'Algerian Centre of Packaging & Conditioning' and seeks technical assistance to develop the national capabilities of laboratory support and technical expertise for the purpose.

#### 4.0. INSTITUT ALGERIEN DE NORMALISATION ET DE PROPRIETE INDUSTRIELLE (I.N.A.P.I.)

4.1. The Institute's main objectives are standardization of products, variety reduction, certification, promotion for transfer of technology, protection of inventions, trade marks, diffusion of information concerning norms, liaison with counterpart regional and international organisations etc. A beginning has been made to adopt international standards as a starting point for the formulation of national standards for a large number of products. A similar approach is intended to be followed for the products of the packaging industry including those of the food processing & packaging ones.

4.2. The Institute does not have any laboratory support of its own but instead relies on the test reports of the manufacturers. Nor it has not done enough work in the field of packaging. The institute is keen to overcome the insufficiency of experienced expertise in the field through training of at least two of its technical staff on 'packaging standardization'. Since the institute is involved in the certification work, it feels the necessity of developing capacities and capabilities for testing and analysis of products and packages in laboratories affiliated to it.

#### 5.0 IDENTIFICATION OF NEEDS FOR TECHNICAL ASSISTANCE - PROMOTION OF PROJECTS SERVICES

5.1 Salient features of project's technical services including those of problem solving technical assistance, training of technical staff, fellowships, seminars, formulation of packaging standards & certification procedures, development of systems of quality control and material testing, documentation & information were provided. The national

authorities and other concerned including members of the Chamber of Commerce, metal can manufacturing Unit, organization for standardisation were invited to take full benefit of these services. The authorities would welcome technical assistance to prepare a project document for development of an 'ALGERIAN CENTRE OF PACKAGING AND CONDITIONING' with details of inputs of fellowship training, expertise and equipment, needed for developing basic services of the centre. An official request for providing this assistance may follow and be made to AIDO/UNIDO within the framework of the ongoing project and or future project.

## 5.2 ALGERIAN CHAMBER OF COMMERCE

Discussions were held with the representatives of the Algerian Chamber of Commerce. The Chamber authorities were not aware of the technical services of the project save for a circular which they had received in the past for nomination of a participant in one of the seminars. The Chamber is a useful contact point to represent industrial/manufacturing/commercial interests particularly those operating in the private sector. It is contemplating to set up a national documentation and information centre and related dissemination service. The Chamber was advised to approach AIDO at Baghdad and ARPAC at Casablanca to seek the requisite information.

## 5.3 ENTREPRISE NATIONALE DES EMBALLAGES METALLIQUES

This enterprise serves as a major source of supply of metal cans for use by the food industry. The enterprise has many problems of quality assurance and improvement of the cans it manufactures, design and diversity of product mix, process optimisation and keenly desires to upgrade its expertise through linkages with advanced technology and contacts with reasearch and development organisations producing sanitary cans for food products. It has very limited facilities and expertise for quality testing for incoming tinplates, coating thickness, determination of pin holes in coating, corrosion & seam quality testing. Immediately, it seeks advice on upgradation of its technical expertise responsible for 'in process quality control' and laboratory facilities.

## 6.0 RECOMMENDATIONS

6.1 Preparatory assistance in the form of an Expert mission for two months is recommended to assist the Ministry of Commerce in the formulation of a project document for the establishment of a 'Centre of Packaging & Conditioning' suitable to the requirements of the country.

6.2 Algerian Authorities are pursuing plans to effect a substantial increase in their exports of fresh fruits and vegetables but have no access to facilities for performance testing of packages under simulated conditions of distribution hazards. Technical assistance for development of national capacities & expertise and laboratories is needed on a priority basis. An expert mission for a period of 2 months is recommended.

6.3 Two technician of the Institut Algerien de Normalisation et de Proprieté Industrielle (I.N.A.P.I.) should be trained in the field of formulation of packaging standards for food products and institute be adequately equipped with necessary reference material on packaging standards.

6.4 The Enterprise National des Emballages Metalliques should be assisted in the upgradation of its expertise engaged 'in Process Quality Control'. A four to six weeks mission by a packaging technologist with relevant experience is recommended.

6.5 Technical assistance for the improvement of packaging design particularly graphic art should be provided through advanced training of two graphic designers in an organisation / institute of repute or an expert mission for a period of one month on the subject.

BAHRAIN

MANAMA

1.0. FCCAL POINTS : Ministry of Development and Industry - Directorate of industry is engaged in fostering the industrial development of Bahrain and encourages programmes including research, training of personnel that can stimulate the development process. The Directorate should be deemed as the focal point to provide mutual communication and organisation of groups within the industrial and Agricultural sectors to initiate and pursue programmes of common technical, technological and management interests in the field of packaging.

1.1. The Ministry maintains close contacts with other economic wings of the public and private sector undertakings and is keen to offer the industry personnel opportunity to learn about the latest innovations in packaging of fresh fruits & vegetables, processed foods, commodities, dangerous goods etc. With the opening of the cause away with S. ARABIA, new avenues of investment opportunities in Bahrain have been unfolded and plans to attract foreign capital particularly to set up consumer goods and processed food industries are nearing completion. The economic liberalism and incentives to set up new industries in the country coupled with country's access to the markets in the Gulf region, expanding financial resources, availability of infrastructure of power, roads, transport & communication and banking, the country's aim to set up a wide range of industries, promotion of new & expansion of existing packaging industries are part of the "package of industries" which the Directorate is anxious to promote.

1.2. The Directorate would welcome to receive the findings of projects' study, "forecasts of consumption demand and inventory of capacities of the packaging industry in Bahrain" and simultaneously seeks assistance to identify investment opportunities in the field of packaging.

## 2.0. Survey of Technological Institutions

- 2.1. The national activities relating to the formulation of standards are the responsibility of the standards and metrology section of the Ministry of Commerce and Agriculture. Its nine members team is trying to improve its delivery capabilities and is busy in obtaining up to date information on the Arab Gulf and international standards on a large number of products. This section hopes to work in close association with the Saudi Arabian Standardisation Organisation, Riyadh and have plans to expand its activities in many fields in days to come. The section, it is understood, has already been authorised to recruit more staff and may soon have at least 38 technically qualified persons on its rolls.
- 2.2. A National Committee on Standards consisting of members from the ministries of health, works & Power, housing, legal affairs, transport, commerce, interior & chamber of commerce and industry, Gulf Polytechnic, decides on policy matters regarding the formulation / adoption and implementation of standards. The Ministry of commerce is anxious to commence the work relating to the formulation and certification of packaging standards for materials used in food packaging. Already standards for labelling requirements have been adopted. The Ministry relies on the support of the laboratories of the Ministry of Health for assessment & verification of the product and material properties of food products it samples for certification.
- 2.3. Perishable food distribution is one of important areas requiring immediate attention with limited efficiencies in handling in highly humid and warm climate where packaging standards need to be substantially upgraded. Not enough attention is being paid to filling of containers and identification of contents. The malady is resulting in sizable losses to the fresh produce. The Ministry desires to formulate packaging standards to prevent such losses and to improve the efficiency of the distribution system.



2.4. None of the technical members of the staff is familiar with the methodology of formulation, promotion & implementation of packaging standards. The need to have standards for packaging materials coming in direct contact with the food is of paramount importance. The Ministry would progressively like to regulate the production, imports and distribution of food products according to certain internationally accepted norms. Containers have to be prohibited which contain a poisonous component, meet necessary specifications and shelf life requirement which must be serviceable in a variety of climatic conditions. It is necessary to upgrade the expertise of the standards & Metrology section by training their staff on finer aspects of formulation of packaging standards & certification procedures.

#### 2.5. Ministry of Health

Department of Public Health and welfare is the "protection arm" extended to safeguard the interests of consumers. The food, drug & cosmetics laws are administered by the Ministry of Health and simultaneously it searches for improved legislation and measures to protect the consumers from any harmful effects. Products are tested for levels of toxicity. Its back up facilities of laboratories and available expertise need to be strengthened in the interests of facilitating a good or wholesome food supply. Samples of food imported and manufactured are tested to detect the presence of any toxic agent. The knowledge and facilities for any scientific evaluation of foods in packaging material for the life span of the product are extremely inadequate. Often, the supplier's assurances that the food and packaging materials meet the requirements of compatibility are relied upon. For instance, polyethylene is used extensively for packaging of snack foods, many of the polyethylenes used may not be food grade.

2.6. The laboratories of the public health and welfare department are very thinly manned and suffer from acute shortages of manpower. No migration studies under simulated conditions of

distribution are being made, although the food is distributed under conditions where the diffusion of migratory substances into food products increased with rise/increase in temperatures.

2.7 The laboratory desires to train two of its staff members on "Migration studies for the entire shelf life of a packaged food" and subsequently requires the services of a packaging technologist to help the laboratory improve its expertise in conducting "shelf life studies".

### 3.0. Promotion of Projects' Services - Identification of Needs for Technical Assistance

3.1. Discussions were held with the officials and concerned functionaries of Gulf Polytechnic, Chamber of Commerce and Industry, and Specialists of DATE PROJECT of the Ministry of Commerce and Agriculture. The Gulf Polytechnic is anxious to get a couple of their faculty members trained on features of packaging designs - graphics & structurals. They would like to offer packaging courses on the subject and help strengthen the resources of technical manpower in the field of packaging.

3.2. The Chamber of Commerce and Industry, feels the necessity of providing training for quality assurance and improvements of packaging materials produced locally and or imported into the country. For the benefit of the food producing industries, importers, shippers, custom & health authorities, the Chamber proposes a seminar on the subject of "CHOICE OF PACKAGING MATERIALS FOR FOODS" to be held jointly in association with UNIDO.

3.3. On the spot advice was given to the representatives of the Date Projects of Ministry of Commerce and Agriculture - in respect of graphic characteristics of the prototypes shown to the consultant. Regarding other features viz preservation of the quality of dates, resistance to moisture, infestation, dust, discolouring etc, the representatives were advised to contact the date Project specialist of FAO in Baghdad, where it is learned an extensive work has already been completed.

4.0. Recommendations

4.1. It is recommended that technical assistance consisting of expert missions and fellowship training be provided to the organisations listed below :

(i) Ministry of Development & Industry	Expert Mission	Packaging Survey - Identification of investment opportunities	2 m/m
(ii) Ministry of Commerce and Agriculture	Expert Mission	Packaging Standards & Certification Procedures	3 m/m
- Standards & Metrology Section	Expert Mission	Packaging of Fresh Fruits & Vegetables	2 m/m
	Fellowship Training	Packaging Standards 2 technicians	3 m/m
(iii) Ministry of Health	Expert Mission	Migration Studies for entire shelf life of packaged foods	2 m/m
	Fellowship Training	Migration studies for entire shelf life of packaged foods	3 m/m
	(Two technicians)		

## EGYPT

### 1.0 FOCAL POINTS

- 1.1 The Egyptian Packaging Association (EPDA) and the GENERAL ORGANISATION FOR INDUSTRIALISATION (GOFI) are the two main prospects to represent the national packaging interests in Egypt. Officials of both these organisations are endeavouring to support a sustained campaign for the development of the packaging industry in Egypt. While EPDA has been able to muster the support of chambers of commerce, Industrial Federations, Marketing companies, packaging material and converting companies and other package users, GOFI, General Organisation for Standardisation, National Academy for Scientific Research etc., GOFI is a purely a Governmental Organisation with packaging as one of its many activities. The organisational structure of the General assembly of EPDA and board of Directors (annex I) presents an interesting integration of diverse and related interests concerned with packaging. The consultant, had the opportunity to attend an urgently convened meeting of executive committee of EPDA & invitees and would like to record that the deliberations were highly impressive. EPDA can be deemed to be an important, non Governmental focal point engaged in the creation of the Packaging Centre.

In depth consultations were held with the officials of EPDA & GOFI on the possible role of each of the organisation individually and collectively in the development of the packaging industry in Egypt, and their support to the Egyptian packaging Centre under establishment .

Both these organisations are performing complementary roles, it would therefore be preferable to regard both these organisations as part of the communication net work, although GOFI is, exclusively, a Governmental organisation .

### 2.0 SURVEY OF TECHNOLOGICAL INSTITUTIONS

- 2.1 EPDA's Egyptian PACKAGING CENTRE is likely to commence functioning from June 1987 onwards. At the requests of EPDA, the

LABORATOIRE NATIONAL D'ESSAIS PARIS have proposed an organisational structure (vide annex Ii). The proposed Centre is recommended to have major Departments viz Development, TECHNICAL and Documentation and Information. Laboratory support facilities in the form of package performance testing, climatic chambers, testing of physical and chemical properties of materials and workshop for prototypes.

- 2.2 The Egyptian authorities are in favour of creating a fully functional packaging CENTRE and are anxious to have UNDP's assistance through UNIDO's technical contributions in strengthening the technical base of the CENTRE.

### 3.0 EGYPTIAN ORGANISATION FOR STANDARDISATION

The organisation plays a pivotal role in the formulation of standardisation for packaging and certification of material characteristics of different packaging material produced in the country. The consultant visited the organisations Head Quarters and the Laboratories and observed the following.

- (i) The organisation does not have any trained packaging staff familiar with the methodology for the formulation of packaging standards.
- (ii) Most of the standards so far formulated are of standards obtaining else.
- (iii) The laboratories are extremely under equipped for testing of the chemical properties of materials, the mechanical strengths of paper and board and plastic films. Technical staff though enthusiastic are not familiar with the advances made in the testing equipment and test methodologies

Their knowledge about the interpretation of the test results is inadequate.

- (iv) There is no package performance testing laboratory nor the institute is well equipped to carry out shelf life studies in respect of food products and related packaging materials.

#### 4.0 PROMOTION OF PROJECT SERVICES IDENTIFICATION OF NEEDS FOR TECHNICAL ASSISTANCE

At the invitation of the Egyptian PACKAGING DEVELOPMENT ASSOCIATION, the consultant participated as speaker in an INTERNATIONAL SEMINAR ON "ADHESIVE AND CLOSURES" -

While tracing the status of packaging development in the developing countries- detailed references are made to the technical services of the Regional Project. The seminar was attended by 95 participants. Opportunily was utilised to hold consultation with a number of participants representing almost all the segments of the packaging and user industries in Egypt. A number of areas requiring technical assistance have been identified and are dealt with in the following section. No benefits could be availed of the technical services of the ongoing project by the country. In a majority of the cases, they did not have enough information of the project's activities and schedules of implementation.

#### 5.0 RECOMMENDATIONS

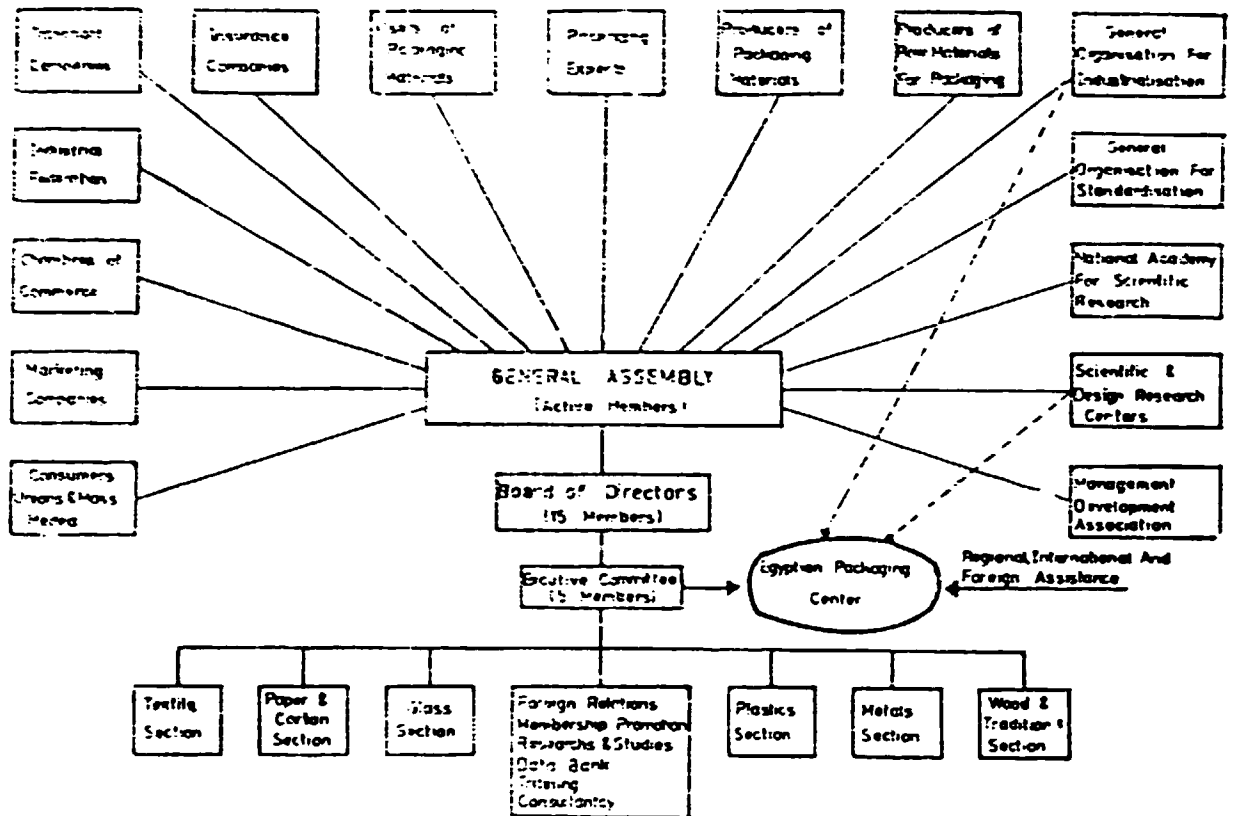
##### 5.1 EXPERT MISSIONS

- |       |  |      |
|-------|--|------|
| (i)   | Development of the Egyptian PACKAGING CENTRE   | 3m/m |
| (ii)  | Development of Packages for edible oil   | 2m/m |
| (iii) | formulation of Packaging Standards-Guidelines ,<br>METHODOLOGY AND CERTIFICATION PROCEDURS | 2m/m |

##### 5.2 FELLOWSHIP TRAINING

- |      |   |      |
|------|---|------|
| (i)  | Packaging Documentation & Information   | 2m/m |
| (ii) | PACKAGE TESTING AND ANALYSIS<br>- 2 TECHNICIANS from the LABORATOIRE<br>- NATIONAL D'ESSAIS | 3m/m |

**EGYPTIAN PACKAGING DEVELOPMENT ASSOCIATION**  
Organisational Structure



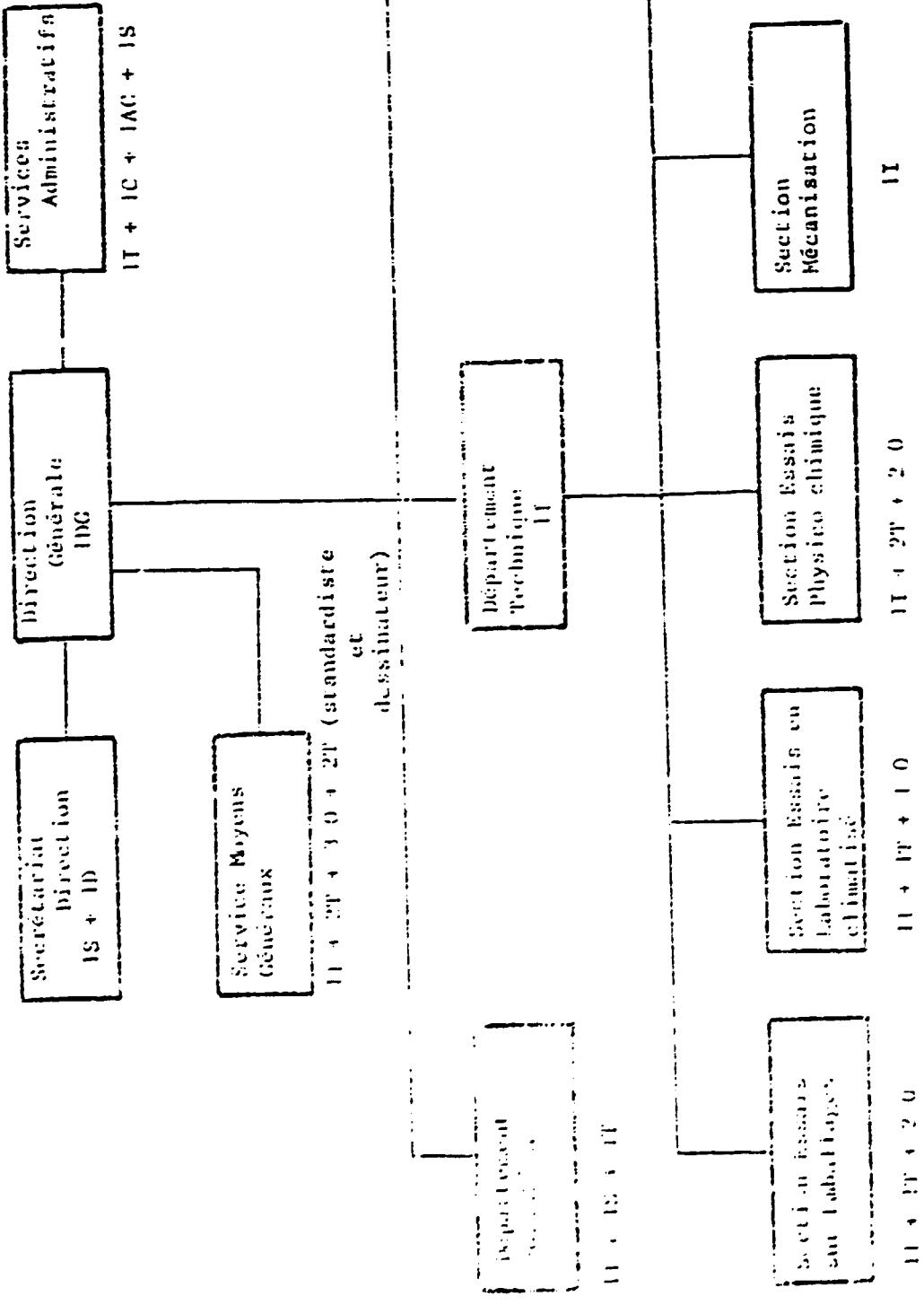
**Special Services of EPDA**

- Selection of Experts & Consultants in the field of Packaging.
- Recommending Suppliers of Packaging machinery, equipments, materials, ... etc.
- Design and executing training programs.
- Undertaking Feasibility Studies, diagnostic studies, market research studies, by Competent International and Egyptian Experts.

Récapitulation du personnel

Designation	Symb	Nb
Direct. Générale	DG	1
Ingen. / Cadre	I	9
Technicien	T	9
Ouvr. / Aide. Labo	O	8
Secrétaire	E	4
Dactylo	D	1
Comptable	C	1
Aide - Compt.	AC	1
<b>Total</b>		<b>36</b>

ORGANIGRAMME DU CENTRE (Phase : 3)



Annexe : 19



I R A Q

1.0 FOCAL POINTS

1.1 The Ministry of light Industries, Government of IRAQ has been concerned with the need to bring about a qualitative and quatitative change in the packaging material and packages manufactured and or imported into the country. It has also been endeavouring to set up national capacities of an infrastruc- ture nature eg a packaging centre to offer various types of packaging related services to the industry both private and public and other economic Ministries in evolving suitable policies and programmes for the development of the Industry. This Ministry, not with standing, the current national combulsions born out of emergency situations in the country 'WAR) is coordinating the task of creating a cadre of packaging specialists through training . It will be appropriate to regard this Ministry as the national focal point.

The ARAB FEDERATION FOR INDUSTRIES BAGHDAD is one of the very active organisations promoting the cause of the food industries including that of packaging in the ARAB region.

It has been pursuing and advising all concerned, to top the potentials available to the processed food and meat industries . It will be beneficial to use this channel for promotion of technical services on a selective basis.

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2.0 IRAQ

2.1 SURVEY OF TECHNOLOGICAL INSTITUTIONS

The CENTRAL ORGANISATION FOR STANDARDISATION and quality Control is entrusted with the task of developing national packaging standards. The Organisation is well equipped with technical expertise and equipment and highly integrated with the manufacturing and other user industries. A couple of technicians are involved in the testing and analysis work of cartons-paper and board and plastic bags and films. The Organisation's ability to develop and offer packaging services of testing and standards hold good promise, if a nucleus of its expertise could be upgraded through training. Majority of the equipment needed for chemical and physical testing of materials is already available and functioning well. The Organisation will essentially require to upgrade its facilities for undertaking shelf life studies for food items.

2.2 The equipment for undertaking package performance testing under simulated conditions of distribution had already been procured by the Organisation and was pending installation.

However it was observed that no member of the technical staff had been trained to perform transport worthiness tests.

2.3 To make this Organisation, as a centre for packaging material and performance testing, principally would require the training of at least 8 technicians in different types of packaging materials and packages. The facilities for offering training programmes in Quality assurance and Control, can be developed. The pre-requisites, for this Organisation to develop and offer all types of packaging services do exist and can be further strengthened through technical assistance, should the national authorities decide to have a packaging centre as an integral part of this Organisation.

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3.0 IRAQ CHAMBER OF COMMERCE

3.1 The consultation held with the President of the Chamber of Commerce and the Director incharge of packaging, revealed that the Chamber was already at an advance stage of establishing a packaging centre under its own management. A draft memorandum for the purpose is awaiting Presidential approval. Initially, the Chamber is planning to set up a packaging Laboratory for testing of paper and board and would endeavour to offer services of training to different segments of the packaging and user industries. At the request of the Chamber, guidelines on the role of a packagign CENTRE were provided.

On practical considerations and specially in the light of available facilities, the Organisation for Standardisation and quality control offers better advantages to host a packaging Centre, at least during the initial stages of its inception.

4.0 PROMOTION OF PROJECT SERVICES-IDENTIFICATION OF NEED FOR TECHNICAL ASSISTANCE

4.1 The industry in general is state managed, although a number of small/meduim scale manufacturers are engaged in the production of processed food. On return of normalcy, the authorities plan to develop packaging industries particularly those whose products are required for packaging of food-items. Discussions held with the IRAQ CHAMBER OF COMMERCE under scored that the IRAQIAN packaging and related industries need to be Oriented to quality assurance and improvement programmes. A more likely explanation for this is available from a review of consumer packages available in the market . An overwhelming majority of these present evidence where creative development and quality improvement work can clearly result in achieving substantial packaging economies.

4.2 The quality of industrial (package) printing and graphic design are of pragmatic concern of packaging manufacturers and food packagnig industries. In retrospect, the conceptualisations

are some what limited, culture-bound and are mainly addressed to the needs of the traditional markets. The packaging manufacturers do display interest in seeking enhanced knowledge and well developed skills. The ava requires to be strengthened.

4.3 According to well informed sources, the information about the services of the project was available with the Ministry of Light Industries, who have been circulating the same among the concerned Organisations.

5.0 RECOMMENDATIONS

5.1 EXPERT MISSIONS

- |       |   |      |
|-------|---|------|
| (i)   | Formulation of packaging standards for food and certification procedures<br>COSQC | 3m/m |
| (ii)  | Development of a PACKAGING CENTRE   | 2m/m |
| (iii) | ESTABLISHMENT OF A TRANSPORT WORTHINESS PERFORMANCE TESTING LABORATORY - COSQC    | 2m/m |
| (iv)  | TESTING, ANALYSIS AND QUALITY CONTROL OF PACKAGING MATERIAL;                      | 1m/m |
| (v)   | PACKAGE PRINTING  | 1m/m |

FELLOWSHIPS

PACKAGING MATERIAL TESTING AND SHELF LIFE STUDIES FOR FOOD (8 fellowships) for technical staff working in the Organisation for Standardisation and Quality Control

12m/m

JORDAN - AMMAN

1.0. FOCAL POINTS

1.1. Ministry of Trade and Industry have out lined Government programmes to develop national resources of expertise needed for the development of the packaging industry in Jordan, This Ministry had been and should be the focal point in the context of fostering development programmes and maintaining liaison and co-operation with the producers of packaging materials, users and allied trade & professional associations in Jordan and within the Arab Region. The Ministry have already initiated steps to strenghten its directorate of standards and is concerned with the rising costs of packaging materials, limited concern of local manufacturers to improve quality of packages and high incidence of improper or inadequately packed agricultural products. Many of the user industries continue to pack products either in a conventional way and or most sophisticated way without seeking a relationship with the trading patterns and buying habits of the markets in Jordan. Accordingly, the cost effectiveness of packaging is at a great discount.

All too frequently, the growers of agricultural products, shippers do not take enough precautions to prepare their products for the total journey from the point of production to the point of production. The shippers, the transporters, the receivers and retailers are unaware of the need for the special care of the products and fail to take necessary action for adequate quality maintenance.

1.2. With a view to correcting the situation and to promote basic research and development in packaging, disseminate research based information to a wide variety of target groups, provide facilities for training of packaging personnel and trouble shooting advice to the packaging and user industries, the Ministry desires to establish a Packaging Centre and may include it as part of proposed Centre for Specifications in Jordan.

## 2.0. SURVEY OF TECHNOLOGICAL INSTITUTIONS

- 2.1. The Royal Scientific Society is a national infrastructure dedicated to research and development for a wide spectrum of products & processes. Through its scientific expertise, the Society is helping the industry in quality improvement, promotion of the concept of fitness for use with high productivity, low waste, minimal down time etc. Many of the specialists contacted, no more harbour the belief that improvements in product quality and processes are enough to ensure their safe passage and delivery to the consumers. The expertise, facilities of the Society need to be upgraded to undertake research and development in the field of packaging, analysis of dominant causes that impair the fitness for use of the products & produce in the distribution system of the country. Seldom an autopsy of product, or failed part analysis is being done. Accordingly, the diagnosticians and researchers' work remain incomplete and they are not able to correctly specify the remedies.
- 2.2. The Society's management, would like to provide services of testing, training, diagnostic & remedial problem solving consultancy, modification of design, proper methods of quality and standards for packaging materials for different uses and look forward to the financial support from the Government of Jordan for the commencement of such services.
- 2.3. The R.S.S already have laboratories for testing of paper & board, plastic films, and chemical properties of various foods, water and other products, besides having extensive workshops, pilot plants and material testing laboratories for building materials. Already some work on assessment of the quality of foods in plastic packaging is being done ; however such studies relate only to the assessment of the properties of the food at the time of sampling and do not cover the entire shelf life of the foods intended by the manufacturer.

2.5. The management expressed the desire for technical assistance in the upgradation of their expertise for Packaging for food and also for the services of a Packaging Technologist who could help them in the establishment of a packaging Centre. In addition, they would require to train their technical staff in respect of packaging materials testing particularly metal cans.

2.6. The Society has no laboratory for testing of complete and filled packages under simulated conditions of distribution systems and may have to set up a transport worthiness testing laboratory for the in house packaging research and development work as well as to provide guidance to the packaging manufactures and users about the journey worthiness of the packages to withstand distributional hazards.

2.7. Directorate of Standards - Ministry of Trade and Industry

The Directorate is under constant demand and pressure to increase its pace in the formulation of packaging standards particularly for materials used for food packaging. The law of the land prohibits the traffic in injurious foods but have very little technical facilities to check the toxicity of materials coming in direct contact with food throughout its life span. In addition, the directorate has to formulate a host of other measures to control fraud or deliberate attempts to violate the fair trade practices. It has also the responsibility to help the industry eliminate superfluous packaging and rid it of the incidence of proliferation of sizes... The immense importance and relevance of such standards can not be over emphasized to the packaging industry.

- 2.8. Recognising the many problems facing the directorate relating to the formulation and certification of packaging standards and the limited concern for quality displayed by the package producing and user industries, the directorate desires to have technical assistance in a number of areas - viz (i) expert's advice for upgradation of packaging standards (ii) three training programmes one each on Testing & Quality Control of packaging materials; food packaging in metal cans & plastics and Paper & Board in packaging - for industrial personnel. (iii) Expert's advice on improvements in packaging designs - Graphics & printing characteristics and (iv) fellowship training for technical staff of Directorate and nominees of the industry ; formulation of packaging standards (2 technicians) ; testing & quality control of metal cans, packaging of food products in metal cans as applicable.

### 3.0. ARAB STANDARDS AND METROLOGICAL ORGANISATION (ASMO)

- 3.1. ASMO's technical committee n° 19 consisting of members from some of the Arab countries is responsible for the formulation of packaging standards for the Arab countries. The Moroccan Institute of Packaging in Casablanca has been delegated the responsibility of coordinating the work of this committee and formulate drafts of packaging standards for consideration & approval by ASMO. Already, 25 packaging standards have been drafted by the committee, of which seven have been distributed. However, the Management of ASMO feels that the pace of work should be substantially improved by reinforcing the resources of expertise of the committee. Due to constraints of finance, the meeting of the committee could not be held in 1986 and the prospects to hold it in 1987 appear to be bleak.
- 3.2. ASMO feels the necessity of holding a PAN ARAB seminar on Quality Planning, Standards and Control of Packaging Materials in Amman and may approach UNDP/UNIDO for technical and financial support to the seminar.



4.0. Promotion of Project Services - Identification of Needs for Technical Assistance

4.1. All respondents were fully aware of the nature and scope of projects' services and the country had taken due benefits of the project. The Ministry of Trade and Industry seems to be maintaining close links with trade and Industrial associations and is aware of the gaps that the the Jordanian packaging industry faces.

5.0. RECOMMENDATIONS

The packaging industry in Jordan faces by & large, the major problems in maintaining the quality of packaging materials produced in the country. The following areas of assistance are recommended :

I - EXPERT MISSIONS :

	DURATION (man months)
a) Establishment of a Packaging Centre	3 m/m
b) Migration studies for the entire shelf life of food - Compatibility of Packaging materials	2 m/m
c) Upgradation of packaging standards formulation of guidelines for packaging materials for food packaging	3 m/m
d) Packaging Design - Graphics & Printing	2 m/m
e) Metal cans in Food Packaging	2 m/m
f) Reycling of packaging waste	2 m/m

II- FELLOWSHIP TRAINING

(i) Formulation of Packaging Standards (Two technicians)	3 m/m
(ii) Testing & Quality control of metal cans	1.5 m/m
(iii) Shelf life studies of foods in metal cans	1.5 m/m

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III - TRAINING PROGRAMMES

- |   |           |
|---|-----------|
| (i) Packaging Material Testing, analysis<br>& quality control | 7-10 days |
| (ii) Paper, board & laminates in Packaging                    | 7-10 days |

LIBYA - TRIPOLI

1.0. Focal Points

1.1. The Libyan Ministry of Industry, Organisation for Light Industries coordinates the programmes and investment strategies for the development of the packaging and other light industries in the country. This organisation should be treated as the national focal point.

It is to be noted that all industrial activities, manufacturing, trading are state managed and controlled. The output of the decentralised sectors viz agriculture, animal husbandry, fisheries etc are procured through a net work of cooperatives, who undertake marketing activities among various consuming segments of the country. All imports & exports are centralised and so are the imports of the packaging materials.

1.2. The packaging industry consists of the manufacture of :

- (i) Paper and board
- (ii) CF Board boxes & cartons
- (iii) Extrusion of plastic films
- (iv) Plastic bottles
- (v) Metal containers - cans
- (vi) Hollow glass
- (vii) Closures
- (viii) Wooden cases
- (ix) Paper sacks

1.3. The Ministry is contemplating to formulate a national plan for packaging materials so as to avoid occasional shortages of packaging materials. At the present moment, the concerned facilities for quality improvement of various packaging materials produced in the country are at a low level. The authorities are keen to adopt measures and provide support services to arrest the decline in quality standards of the packaging materials.

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A Government sponsored study "Packaging Sector in Libya" was conducted in 1976 and efforts are under progress to update it. The study, among others things, endeavours to highlight the current status of the packaging industry in Libya and spell out forecasts of consumption demand for packaging material. This study is being attempted by the packaging unit of the Industrial Research Centre.

1.4. INDUSTRIAL RESEARCH CENTRE : is a scientific and research organisation endowed to develop research based processes, materials and knowledge to aid the pace of industrial development in Libya. It is also a national test house to assess the quality standards of materials & products produced locally, and imported into the country. The Centre is represented on a wide range of industry based committees and is regarded as an important functionary to advise on different aspects of industrial health and progress of the Libyan industries. In the context of its current and potential role in the industrial development of the country, it is pertinent to regard this Centre as an additional focal point in the network of communication for the promotion and development of the packaging industries in Libya. Besides, this centre is the closest, single organisation, to the packaging material manufacturers, package producers and end user industries and therefore qualifies well to be deemed as a part of the communication network.

2.0. SURVEY OF TECHNOLOGICAL INSTITUTIONS : Detailed discussions carried out with the Ministry of Industry - ORGANISATION FOR LIGHT INDUSTRIES touched on the plans to develop a section of the Industrial Research Centre into a full fledged packaging unit capable of supporting and offering packaging services to a widely scattered interests in the country.

2.1. The Centre's objectives and programme of work equipped with resources of research laboratories, well planned buildings, library, scientific and research staff and its integration with the users industries make it to be the most favourable choice - to be the seat of packaging related services of testing, training, documentation & information, transfer of technology formulation of packaging standards, etc.

2.2. The current facilities of laboratories include an enormous array of testing equipment needed for testing of chemical properties, physical characteristics, microbiological features. The range of equipment consists of :

- (i) Microscopes
- (ii) Scanning electronic microscopes
- (iii) XRAY diffractometer (for crystallinity tests)
- (iv) DTA / TMA / DSC / TGA - for thermal stability tests
- (v) Universal testing equipment
- (vi) Tear Testers
- (vii) Impact testers
- (viii) INFRA-RED SPECTROPHOTOMETER
- (ix) Gas chromatograph
- (x) Atomic Absorption spectrophotometer
- (xi) Polarising Microscope
- (xii) Fracture analyser voids and surface defects
- (xiii) Climatic rooms
- (xiv) Humidity Cabinets

AND

- (xv) A variety of materials, scientific ancillaries needed for testing of materials particularly the chemical properties.

2.3. Packaging Unit : All packaging related work is the responsibility of two scientific and technical personnel . In association with the food science department of the AL-FATEH University, the Unit has formed a task force (although it is called a packaging committee) to undertake packaging related studies. This task force is expanding its efforts to reach a wide group of packaging

related prospects and have already been able to orient the national authorities on the necessity of establishing a well equipped packaging Division at the IRC. The team's efforts need to be complemented and upgraded to become equal to the task it faces. Often, the unit is called upon to give its opinion on the suitability or otherwise of different plastic materials used for food packaging and to formulate correct specifications. The unit is under pressure and is not able to satisfy the local demand to certify the appropriateness of the usage of plastic materials. The limitations of knowledge, lack of facilities for determination of "shelf life" of various food products in different types of plastic containers and their performance in the distribution system in the country etc reduce the effectiveness of the unit to render useful service to the industry. The combined effect of such lack of facilities in the country have led to a climate of permissiveness to commission the use of plastics for packaging of a number of food products without ascertaining whether these were causing/posing any health hazards to the consumers.

- 2.4. Eventually, the centre would require at least a team of 6 to 8 technically qualified persons in packaging materials testing, shelf-life studies and testing the performance of packages under simulated conditions relating to the distribution system of the country. The IRC authorities realise the need to initiate and step up packaging related services and look forward to the availability of technical assistance to train their staff on different aspects of packaging on a priority basis. Besides, the centre needs the services of packaging specialists to offer problem solving consultancy; for the establishment of a packaging centre, development of packaging standards for food products, development of packages for edible oil, and packaging training.

The Unit is already involved in assessing the status of the packaging industry in the country, but would need technical expertise to complement its efforts in assessing

in depth, the existing technical and technological strengths of the industry, identification of the gaps that impede its well being and further progress and evolution of strategies to overcome these gaps in the immediate future.

### 2.5. LIBYAN STANDARDS & PATENT SECTION

This section of IRC is relatively new and is still facing the problems encountered in the formative stage. Its present strength consists of two technical persons, who are expected to provide the necessary support to the task of standardisation in the country. In the context of the needs for the formulation of packaging standards, implementation & certification procedures, the resources are grossly inadequate and essentially need to be complemented.

### 3.0. Promotion of Project Services - Identification of needs for Technical Assistance

During the mission, the consultant visited MAMRO Complex for food processing industry, food science department of the Al-Fateh University, a couple of state managed distribution centres. These visits and discussions unfolded a number of areas where further work was called for on an urgent basis. For instance, the extent of damages suffered by food in metal cans - in handling and storage are estimated to be of the order of 15-20 percent. A systems approach in revising the specifications of the transport packs and the methods of stacking and handling is called for. There are more evident instances of over packaging in a variety of consumer products, which need to be looked into - particularly in view of the fact that these are packed in materials procured through imports. Similarly there are heavy losses suffered by fresh fruits & vegetables and fishery products.

4.0. Recommendations : Technical Assistance in the following areas is recommended

4.1. For IRC

Expert Missions

- |  |       |
|--|-------|
| (i) Establishment of Packaging Centre                      | 2 m/m |
| (ii) Performance Testing of Complete & filled packages     | 1 m/m |
| (iii) Packaging of olive oil in Plastic bottles            | 2 m/m |
| (iv) Determination of shelf life studies for food products | 2 m/m |
| (v) Status of Packaging Industry<br>- Packaging Survey     | 3 m/m |
| (vi) Formulation of Packaging Standards                    | 3 m/m |

Fellowship Training

- |  |         |
|--|---------|
| (i) Testing & Quality Control - Paper & board - one technician               | 1.5 m/m |
| (ii) Testing & Quality Control - metal & glass - one technician              | 1.5 m/m |
| (iii) Determination of shelf life studies for food products - one technician | 1.5 m/m |
| (iv) Performance testing of complete & filled packages - one technician      | 1.5 m/m |



MOROCCO - CASABLANCA

1.0. FOCAL POINTS

1.1. The Ministry of Commerce and Industry, Directorate of Industries is the national focal point in Morocco for the promotion & growth of the packaging industry. Simultaneously, the Moroccan Institute of Packaging - IMEC, a well developed scientific and training infrastructure in the field of packaging greatly complements the efforts of the Ministry and de-facto is deemed as an important focal point.

2.0. SURVEY OF TECHNOLOGICAL INSTITUTIONS

2.1. IMEC is already functioning as a full fledged packaging Centre and had been the seat of the project "Establishment of the Arab Regional Packaging Centre". The Institutes' Expertise & laboratories & the facilities are adequate not only to answer the needs of Morocco but to some extent the needs of other countries in the Arab Region. The Institute provides packaging services of research & development, training problem solving consultancy, formulation of packaging standards, testing & analysis of packaging material of filled & complete packages, documentation & information & certification of packaging materials & packages. The Institute also acts as the head-quarter of committee n° 19 of the Arab Standardisation and Metrological Organisation (ASMO) - Amman for the formulation of Packaging Standards for the Arab countries.

3.0. PROMOTION OF PROJECT SERVICES - IDENTIFICATION OF NEEDS FOR TECHNICAL ASSISTANCE

3.1. Discussions held with the DG IMEC and his colleagues highlighted the need for technical assistance to the country particularly for carrying out certain studies considered to be of utmost importance. It was mentioned that IMEC resources of

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expertise may not suffice to complete the studies envisaged and need to be complemented.

The areas of technical assistance requested are :

- (i) Study on economics of utilisation of packaging raw materials in Morocco
- (ii) Study on packaging & transportation of dangerous goods by rail ways, roads, air & sea and system of certification
- (iii) Packaging of fresh & frozen fish & sea foods
- (iv) Packaging of foods products in Metal containers & plastics - shelf life studies.

#### 4.0. RECOMMENDATIONS

##### 4.1. Expert Missions

- |     |  |       |
|-----|--|-------|
| I   | Study on economics of utilisation of packaging raw materials in Morocco  | 4 m/m |
| II  | Study on packaging & transportation of dangerous goods by different means of transportation & system of certifications | 2 m/m |
| III | Packaging of fresh & frozen fish & sea foods   | 2 m/m |

##### Fellowship

- |   |         |
|---|---------|
| Packaging of food products in metal containers & plastics - shelf-life studies<br>(one technician). | 1.5 m/m |
|---|---------|

## S. ARABIA

### 1.0 FOCAL POINTS

1.1 The Ministry of Industry and Electricity-department of Protection and Encouragement is the officially nominated channel for the development of the packaging industry in SAUDI ARABIA. The department maintains very close contacts with the Chambers of Commerce and other economic ministeries and commercial organisations in the country . The ministry does not have any immediate plans to establish a packaging committee; it is pertinent to mention that the development of the packaging industry particularly material converting one, is in the hands of the private sector. The council of Saudi Chambers of Commerce and industry coordinates and promotes the interest of the private sector industries and is an apex body representing Chambers of Commerce and Industry functioning in different parts of the country. It is preferable to deem both the Ministry of Industry and Electricity and the council of Chambers of Commerce and Industry as part of the packaging communication net work.

### 2.0 SURVEY OF TECHNICAL INSTITUTIONS

#### 2.1 SAUDI ARABIAN STANDARDS ORGANISATION (SASO)

SASO is the only Saudi organisation, according to the rules of the Royal Decree, responsible for all the activities related to standards and measurements including

- the formulation and adoption of national standards for all commodities and products as well as metrology, symbols, definitions of commodities and products, methods of sampling and testing and any other assignment approved by the board of Directors.
- Publication of standards by the most suitable means
- Diffusion of standardisation awareness and the coordination of activities relating to standards organisations, exchanging

views, assisting in cooperative efforts and representing the country in conferences and meetings of standards organisations.

The organisation's departments consist of

1. Standards
2. Metrology
3. Laboratories
4. General Affairs
5. Public Relations

SASO have, in the eighties adopted eight packaging standards viz.

- (i) Methods of test for complete transport packages-identification of parts when testing.
- (ii) Methods of test for complete, filled transport packages conditioning of testing.
- (iii) Methods of test for complete, filled transport packages stacking test.
- (iv) Methods of test for complete, filled transport packages verticle impact test by dropping
- (v) Methods of test for complete transport packages horizontal impact test (inclined plane test-pendulum test)
- (iv) Methods of test for complete filled transport packages viberation test.
- (viii) Methods of test for complete filled transport packages-water spray test.

SASO's resources of expertise for formulation of packaging standards and certification of packaging material/packages need to be substantially upgraded. Similarly, the Laboratories for carrying out tests, though well equipped for testing of chemical and physical properties of material, do not have facilities for carrying out the transport worthiness tests under simulated conditions of distribution in the domestic and export markets.

- 2.2 The management of SASO, are contemplating to upgrade their expertise and Laboratory facilities so as to be able to formulate

and monitor packaging standards.

2.3 During the visit, the SASO's management were informed about the type of packaging services, a national packaging Centre is expected to provide to a number of target beneficiary groups. The management have evinced a great deal of interest in establishing a national packaging Centre as part and parcel of SASO and would need technical assistance for the purpose. SASO have the basic infrastructure and the necessary culture to support a national packaging centre

### 3.0 KING ABDUL AZIZ CITY FOR SCIENCE AND TECHNOLOGY

3.1 This organisation, apart from supporting basic studies in the area of science and technology, is contemplating to set up a Centre for Plastic studies with the assistance of UNDP either at BASRA IRAQ or perhaps in RIYADH. It is envisaged that this Centre will have the material testing laboratories where facilities of developing prototypes of packages made of plastics may be established. In addition, it is understood that the proposed Centre will have elaborate arrangements for exploring new avenues for use of plastics in packaging.

### 4.0 SAUDI BASIC INDUSTRIES CORPORATION (SABIC)

4.1 SABIC is a joint stock company incorporated in 1976 for the purpose of establishing basic industries which utilise and upgrade country's national resources. The company operates primarily through joint venture partnerships and is aiming to

- (i) Develop natural resources of hydrocarbons and minerals and to convert these resources into higher valued industrial products.
- (ii) Develop SAUDI manpower resources into a trained workforce capable of assuming the responsibilities of industrialisation.

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4.1 (contd)

SABIC is contemplating to promote the development of the packaging industries through upgradation of technical manpower resources of the existing units and establishment of new units. With a view to giving a definite shape to their ideas and to satisfy the potential needs of the country in terms of packaging materials and packages, SABIC have made a study on forecast of demand for packaging material and the current status of the packaging industries in the Kingdom.

4.2 It is understood, that SABIC may establish a CENTRE FOR PACKAGING TRAINING AND TECHNOLOGY DEVELOPMENT under its own management to speedily bring about a nature of change in the technical manpower resources and processes for transfer of technology. It recognises the fact that the speed of advance in manufacturing technologies is currently very rapid and so would like to create a structure that can provide technical expertise to facilitate adaption and developments so as to ensure that the target user groups make use of the technology most efficiently. Immediately, they would like to cosponsor a national seminar on 'PLASTICS IN PACKAGING-RECENT TECHNOLOGICAL ADVANCEMENTS'

5.0 JEDDAH-CHAMBER OF COMMERCE AND INDUSTRY

5.1 The chamber, among its wide and varied activities, offers services of documentation and information to its members. In addition, it organises training programmes aimed at converting the productive capacity of the manufacturing sectors into capabilities particularly relating to:

- (i) Improvements in manufacturing Competence Good quality production facilities.
  - (ii) Production Competence through progressive production management and planning.
  - (iii) Good employer/employee relationships .
  - (iv) Ability to increase output and make something novel.
  - (v) Technical awareness.
- etc...

There is very little activity concerning the field of packaging. The Chamber's management, would welcome technical assistance particularly in the area of training of packaging personnels and set up facilities on a continuous basis vis-a-vis a single shot experiment. They recognise that the packaging industry in the country is dominated by narrow product focus and the tendency if allowed to persist, may cause a decline in terms of number of business units and affect adversely the programmes of modernisation and upscaling of the Industry.

5.2 With their acceptability and respect, the Chamber would like to extend the services which could reduce distribution costs and improve effectiveness in operations through adoption of new methods and technology in packaging.

## 6.0 RECOMMENDATIONS

### 6.1 EXPERT MISSIONS

- (i) SASO - Establishment of a PACKAGING CENTRE 3m/m
- Establishment of a Transport worthiness TESTING LABORATORY 2m/m
  
- (ii) JEDDAH CHAMBER OF COMMERCE AND INDUSTRY
- EXPERT IN TRAINING OF PACKAGING PERSONNEL 2m/m

### 6.2 SEMINAR

- (i) CO-SPONSORSHIP WITH SABIC AND KING ABDUL AZIZ CITY FOR SCIENCE AND TECHNOLOGY - RIYADH 'PLASTIC IN PACKAGING' 0,5m/m
- 'RECENT TECHNOLOGICAL ADVANCEMENTS'
  
- (ii) CO-SPONSORSHIP SASO - RIYADH 'PACKAGING STANDARDISATION'

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6.3 FELLOWSHIP TRAINING

- |  |  |        |
|--|--|--------|
| a) SASO  | (i) TESTING AND ANALYSIS OF PACKAGING MATERIAL-PAPER & BOARD<br>one fellowship | 2m/m   |
|  | (ii) Shelf life studies for food in Plastic packaging-one fellowship           | 2m/m   |
|  | (iii) PACKAGING TRAINING-one fellowship  | 2m/m   |
| b) KIND ABDUL AZIZ CITY FOR SCIENCE & TECHNOLOGY<br>RIYADH |  |        |
|  | (i) PACKAGING DOCUMENTATION & INFORMATION<br>one fellowship                    | 1,5m/m |
|  | (ii) PACKAGING TRAINING -<br>2 fellowships for faculty members                 | 4m/m   |



## 1.0 S O M A L I A

### FOCAL POINTS

- 1.1 The country is in the process of restructuring its economy and allocation of portfolios to various economic ministries for undertaking developmental activities. There is no single Ministry and or Government department specially designated for the promotion of the packaging industry. Broadly speaking, the Ministry of Industry and Commerce, Mogadiscio could be the coordinating base for the development of packaging industry in the Somalia but due a lean period reflected in low capacity utilisation and chronic losses in the manufacturing industries, the responsibility for procuring packaging materials has been accorded to the corresponding Ministries linked with the product or the enterprise. For instance, packaging materials required for frozen fish and sea foods are the responsibility of the Ministry of Fisheries & Marine resources, & those required for the export of fresh fruits, banana, mango, that of the Ministry of Commerce.

During the mission, the consultant elaborated on the benefits of identifying and nominating a packaging committee with representation of different economic Ministries and public and private sector manufacturing and trading interests. This committee could coordinate and organise for the supply of technical assistance on various aspects of the packaging industry. Broad guidelines on the roles and responsibilities of the packaging committees / focal points were provided.

Till further advice on the subject, it is appropriate to deem Ministry of Industry & Commerce as the official focal point in the packaging communication network.

## 2.0 Survey of Technological Institutions

The manufacturing & processing sector accounts for little more than seven percent of GDP and the structure of the sector reflects a policy mainly oriented toward import substitution. The country has not set up any packaging related technological infrastructure in the country. Notwithstanding this absence, the need exists to establish facilities for quality control of packaging

materials used by the food processing units in the country. The up-gradation of facilities for packaging material testing in the Meat factory, Milk Plant & edible oil Mill—all which are currently in the process of rehabilitation, would be essential.

PROMOTION OF PROJECT SERVICES

3.0 Identification of needs for technical assistance :

3.1 Many of the target beneficiary groups did not know much about the type & scope of technical services the project can offer. Accordingly, the benefits obtained by the country from the project activities had remained to be limited.

3.2 Efforts are afoot to establish an Inter-Ministerial task force to review the present planning system, make recommendations for improvement and identify future technical assistance requirements. In depth discussions held with the representatives of a few enterprises and on the spot observational assessment reveal the following areas of technical assistance.

- 1) Packaging for Export of Bananas
- 2) Packaging of frozen fish and sea foods—particularly lobsters
- 3) Quality control and analysis of packaging material for meat / Corned Beef
- 4) Graphic designs for labels for alcoholic drinks particularly Rum for exports.

3.3 Merchant export levels can further rise by seeking new markets for banana, fish sea foods & processed meat. All these would require improvements in packaging designs & standards. Further, the country imports a variety of products particularly consumer goods, automobile ancillaries and practically all these items are imported in consumer / retail packs.

3.4 A substantial reduction in the import bill can be achieved by importing some goods/products in bulk and re-packing these in the country through the establishment of small packing stations near

major points of consumption. This change in the composition of imports needs a selective approach and can be introduced on an experimental basis. A beginning can be made with on food items some fast moving automobile spares electrical products - lamps (bulbs) heating elements, brackets.

#### 4.0 RECOMMENDATIONS

- 4.1 Promotional aspects of packaging services of any future technical assistance should be reviewed so that their extension to less developed countries could be improved.
- 4.2 Technical consultancy missions for a stipulated duration of two months each are recommended in the following areas:
- i) Development of Packages for Export of Bannana
  - ii) Development of Packages for frozen fish and sea foods
  - iii) Graphic designs for lables for export of Rum
  - iv) Quality control and analysis of metal cans.

1.0 S U D A N

1.1 FOCAL POINTS

Ministry of Energy & Industry Khartoum is the designated national authority for the promotion of packaging and related industries in the country. An officer of the level of a Director, has been nominated to plan for the development of the industry and provide a basic framework for policy formulation, capacity creation & utilisation for the supply of packaging materials in the country. He also coordinates & ensures that technical assistance sought and provided matches with the Government priorities. The Ministry encourages other Sectoral Ministries to prepare their requirements in consultation with the respective beneficiary groups and forward the same to the Ministry of Industry for endorsement.

1.2 Although, the Ministry of Energy & Industry is the major reference point for planning of external technical assistance for industrial development, it has yet to enrich this specific role & enlarge scope in the field of packaging. There exists a feeling that the Ministry's resources of expertise are not enough to plan, coordinate and concentrate on providing the right economic framework for a multi-sectoral subject like packaging, particularly in regard to packaging materials needed for food and exports. Following a more pragmatic approach, a framework for a national PACKAGING COMMITTEE representing interests of packaging material producing and users industries, Ministry of Cooperation, Commerce and Supply, Ministry of Energy & Industry, Ministry of Agriculture, Food Research Centre, Industrial Research and Consultancy Centre, Paper and Pulp Research Centre, has been prepared and is under consideration by the Ministry of Cooperation, Commerce & Supply.

2.0 SURVEY OF TECHNOLOGICAL INSTITUTIONS

2.1 On a priori considerations, Food Research Centre SHAMBAT and the Industrial Research and Consultancy Centre were selected for a detailed study from the point of view of upgrading one of these into a national packaging centre. On the spot visits were undertaken

to assess the situation and the prospects for the development & supply of packaging services by either of the Institutions Food Research Centre is a research cum educational organisation engaged in the task of food engineering including development of packaging materials needed for processed foods. It has the necessary culture, scientific expertise and to some extent basic equipment for testing & analysis of the chemical properties of materials. Besides the technical staff has been trained and is well poised for imparting training to technical personnel including students in the food science courses. It is highly appropriate to consider the upgradation of expertise and laboratories of this centre to become a national centre for food Packaging & be an integral part of the Food Research Centre. After gaining a few years of experience, knowledge and acceptance, the national authorities may review it to be upgraded into a full fledged packaging Centre.

2.2 The national environment for improving packaging standards for food items is most favourable and is deemed as a high priority area. A statute to this effect is under preparation. Without the support of technical expertise and national laboratories, the programme of implementation of these standards is less likely to succeed. The positive aspects of statutory provisions demand immediately a support infrastructure fully capable of developing and disseminating packaging knowledge and monitoring specifications.

3.0 PROMOTION OF PROJECT SERVICES  
IDENTIFICATION OF NEEDS FOR TECHNICAL ASSISTANCE

3.1 The mission covered several target groups of packaging services including the organisations dealing with manufacturing of packaging materials. Chamber of Commerce, Food Research Centre, Industrial Research & Consultancy Centre, Ministeries concerned with Industry & exports, Pulp & Paper Research Centre, an importer of automobile spares and whole sale and retail markets in Khartoum and OUMERDAN. The following gaps are identified :

- i) Inadequate technical expertise for formulation of packaging standards for food with the organisation for standards.
- ii) Lack of industry's interest to utilise the laboratory facilities of Pulp & Paper Research Centre.

- iii) Inadequate awareness about the role of packaging in the domestic & export markets.
- iv) Absence of a nationally designated laboratory for certification of packaging specification for foods products.
- v) Absence of trained inspectors concerned with inspection of packages for export of mangoes bannana and grape fruit.
- vi) Inadequate skills and methods to reduce machine / production wastes in packaging material manufacturing enterprise.
- vii) Even with a high deficit in the balance of trade, inadequate concern for changing the composition of imports from imports in consumer / retail packs to imports in bulk.

#### 4.0 RECOMMENDATIONS

- |     |   |       |
|-----|---|-------|
| 4.1 | Technical assistance for preparation of guidelines for formulation of packaging standards for food and training of the technical staff. An expert mission.  | 3 m/m |
| 4.2 | Fellowship training of two engineers from the organisation from standards - formulation of packaging standards.   | 3 m/m |
| 4.3 | Fellowship training of two scientists from the Food Research Centre on shelf life studies for processed food in metal and plastic containers.               | 3 m/m |
| 4.4 | Upgradation of the laboratory of the Food & Research Centre through supply of complimentary equipment for testing of packaging materials-metals & plastics. |       |
| 4.5 | Training of two members of inspecting staff on methods for package inspection.  |       |
| 4.6 | A promotional seminar on Role of Packaging in the National Economy for Senior Managers and Government Officials.  |       |

S Y R I A - DAMASCUS

1.0. FOCAL POINTS

1.1. Realisation of the need to restructure the economy of the country and to bring about a major industrial change have brought to focus the necessity of centralised planning within the framework of the political system of the country. Ministry of Industry coordinates the growth and development programmes of all industries including those of the packaging industry. It is to be noted that a majority of the package manufacturing industry is in the hands of the private sector, although new & basic industries in future are proposed to be set up in the public sector. Accordingly, the Ministry of Industry is the national focal point, endowed with the responsibilities of developing & upgrading national capabilities of expertise, initiate policies & programmes for progressive utilisation of national resources. It is to be noted that Syria imports practically all its requirements of packaging materials except glass. The country is anxious to reduce its dependence on external sources of supply and is searching ways & means for import substitution and methods to optimise the use of packaging materials imported into the country.

2.0. SURVEY OF TECHNOLOGICAL INSTITUTIONS

2.1. Industrial Testing and Research Centre (ITRC)

Discussions held with the Ministry of Industry revealed that the ITRC could best serve the interests of the country by developing & offering packaging knowledge to different packaging related beneficiary groups.

This centre is responsible for developing scientific knowledge and techniques to improve the quality of products, optimise processes & generate new ideas for commercial applications, promote scientific knowledge among the industries in the public and private sector with a view to improve production quality, productivity, profitability and competitive strengths. Broadly the Centre's functions are to help industry in :

- Testing & analysis of all materials & products
- Increasing production
- Improving quality & conformity to standards
- Reducing costs
- Optimum utilisation of local materials
- Improving skills and capabilities of Syrian Technologists & Engineers
- Increasing self reliance
- Assistance in trouble shooting
- Industrial Information & documentation services

2.2. The United Nations Development Programme and UNIDO have actively assisted the establishment and subsequent strengthening of the Centre through successive projects providing expertise, equipment, know-how and training facilities.

2.3. Ever since 1965, the Centre has been offering its expertise to a diversified group of industries and among other things, is entrusted with the task of quality certification for food products and materials like tomato paste, beer, food colours & flavours, soft drinks, cinnamon, butter, edible oil, sugar, dehydrated onions etc. Implementation of quality control systems in industrial production & ensuring products' quality are important activities in which IRTC is expected to help the industry. In addition, the centre offers services of :

- Testing & calibration of testing equipment for industry & trade
- Evolving Systems of Quality Control
- Technological consultancy & advice on technical problems
- Research & Development
- Instrumentation, instrument maintenance & repair
- Training courses for industrial Personnel etc.

2.4. Detailed discussions followed by visits to the laboratories were carried out during the mission. Although the laboratories are engaged in the work of testing and analysis of chemical/physical



properties of materials and other related activities, no such work in respect of packaging materials (except paper & board) and much less on food packaging was being done. It is also true that the demand for packaging material testing and quality control and other packaging services in the past was not of a magnitude and intensity as to influence the centre's management to take appropriate steps for its satisfaction. In the past couple of years, it is learnt, that both the volume and intensity of the demand for services of packaging quality control, choice of materials for food packaging and packaging designs for exports, packaging standards have grown substantially.

2.5. Currently the centre suffers from an extreme inadequacy of technical manpower in relation to the total facilities available. The Centre's management is aware of this situation and hopes to correct it soon through regrouping and re-organisation of its manpower resources, as well as through hiring of new talents.

2.6. The Centre's management fully supports the need to establish a full fledged packaging Division capable of undertaking packaging material testing & quality control, training of technical personnels of the Syrian packaging and end user industries, research and development, industrial information and certification of quality standards of packaging materials & finished packages etc. They need the services of a packaging technologist to help establish this packaging Division and guide the centre's staff in projecting & promoting the usefulness of these services to well demarcated potential user groups. The management expressed the desire to train at least six technical personnel on package testing & quality control through fellowships training abroad, in addition to having an expert on packaging training.

#### 2.7. EQUIPMENT

The Centre's laboratories are well equipped and a majority of the testing equipments already installed can be used for application areas in packaging. The Centre does not have facilities for testing the performance of complete & filled packages but can carry out broadly the microbiological tests, testing of chemical and physical properties of packaging materials

through resources of existing equipment.

### 3.0. SYRIAN ARAB STANDARDISATION AND METROLOGICAL ORGANISATION

- 3.1. The organisation although doing extensive work in the formulation of product standards, have extremely limited expertise for packaging standards. Its library is well stocked with reference documents, periodicals and other publications on a variety of subjects relating to different products, the same is not true in respect of packaging. The management was oriented on the need and scope of packaging standards and was provided with a reference hand out pertaining to the glossary of some packaging standards formulated by organizations viz the American Society for Testing & Materials, the technical Association of Pulp & Paper Industry, the British Standards Institute, the Institute TNO for Packaging Research, the Indian Standards Institute and the Turkish Standards Institute.

The management feels the necessity of having a packaging expert for a period of three months to help strengthen the work of formulation & certification of packaging standards at the national level. Simultaneously, the organisation needs to train at last two of its technicians/ Technical officers in the formulation of packaging standards at the Moroccan Institute of Packaging and or any other Institute of Standardisation well reputed for the purpose.

### 4.0. IDENTIFICATION OF NEEDS OF TECHNICAL ASSISTANCE - PROMOTION OF PROJECT SERVICES

#### 4.1. CHAMBER OF INDUSTRY

The Salient features of projects' technical services and the potential of technical advice that may be offered through the follow-up phase in future, were brought to the notice of the President of the Chamber of Industry. The Chamber is keenly anxious to offer its members

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specifications for packaging of ready made garments and also to organise a seminar on the subject.

#### 4.2. GENERAL ORGANISATION FOR FOOD INDUSTRIES

The Organisation is one of the principal end users of the packaging materials and systems for food packaging. Simultaneously it also suffers from the inadequacies and serious shortcomings of the packages produced by the packaging industries in the country. On an ad-hoc basis, attempts were made to have international expertise for food packaging and some progress was made in the direction through Project's assistance in the form of a packaging consultant's mission. However, the organisation feels the necessity of according the development of packaging industry on a priority basis so that it could effectively use nationally manufactured packages. Immediately, the organisation needs the services of a Glass Technologist to improve the quality of glass jars manufactured in Syria.

#### 4.3. GENERAL FOREIGN TRADE ORGANISATION FOR CHEMICALS & FOOD STUFFS :

This organisation deals with the imports of food stuffs - mainly Butter ghee, Sunflower and other varieties of edible oil, sardines, canned beef, liquid glucose etc and export of ground nuts, cotton lintels, urea, Triple Super Phosphate, industrial & medical alcohol, mineral water.

The organisation imports its products particularly butter ghee (from Holland) edible oil (Italy) in various sizes of multi-coloured metal containers, re-packed into multi-coloured printed / labelled corrugated fibre board boxes in container loads. The area offers enough scope for rationalisation of packages and even the possibility of importing the product in tanker loads with repacking to be done in the country on a sub-contract basis. The facilities for which can be upgraded to realise higher over all benefits.

#### 4.4. MINISTRY OF INDUSTRY

The mission concluded by holding detailed discussions with Dr ABDALLAH SALLOUTA - Deputy Minister of Industry and his team of officers. A number of areas for future technical assistance were identified - a reference to these are made in the next section.

#### 5.0. RECOMMENDATIONS

##### Expert Missions :

- |   |       |
|---|-------|
| (i) Establishment of a Packaging Unit at IRTC & Promotion of packaging services.                          | 4 m/m |
| (ii) Quality control in Glass Jars  | 2 m/m |
| (iii) Packaging of Edible oil - Rationalisation of sizes & up-gradation of re-packing facilities in Syria | 2 m/m |
| (iv) Milk & Dairy products packaging  | 2 m/m |
| (v) Status of Packaging Industry in Syria   | 2 m/m |
- TECHNOLOGICAL GAPS & MEASURES FOR IMPROVEMENTS**

##### Fellowship Training

- |  |         |
|--|---------|
| (vi) (i) Testing, analysis & Quality control of paper & board - 2 technicians for 1.5 m/m each | 3 m/m   |
| (ii) Testing, analysis & quality control of glass bottles, jars & metal cans one technician    | 1.5 m/m |
| (iii) Packaging of Food - Compatibility Studies - 2 technicians for 1.5 m/m each               | 3 m/m   |
| (iv) Packaging standardisation - 2 technicians 1.5 m/m each                                    | 3 m/m   |

##### Seminar

- |  |  |
|--|--|
| (vii) PACKAGING OF READY MADE GARMENTS FOR EXPORTS |  |
|--|--|

## 1.0 TUNISIA - TUNIS

### 1.1 FOCAL POINTS

The Ministry of Commerce and Industry (formerly known as the Ministry of National Economy) department of basic and diversification industries (des industries du cuir et diverses) is the focal point concerned with the development of the packaging industries. This department is contemplating to evolve an integrated programme of direction and guidance for the packaging and other related industries operating in the public and private sectors. In addition, it is engaged in the principal task of identification of shortages and formulation of import policies for packaging materials, policies and incentives for packaging materials used for export of Tunisian products, and international cooperation & appropriate consultations for upgradation of technology.

1.2. On the possible role of the focal point, a document drafted in Arabic at AIDO HQ was made available to the Director in charge of the department. At the national level, the consultant highlighted the importance of :

- (i) A national infrastructure devoted to the development of the science and technology of packaging related to country's needs and dissemination of knowledge to different beneficiary groups through different types of packaging services.
- (ii) Identification of basic projects, organisation of feasibility studies in the field of packaging materials and packages, assessment of technological gaps and formulation of strategies for upgradation of packaging technology, quality standards, technical expertise, etc
- (iii) Formation of economic groupings for national consultation, exchange of industrial and technological information, coordination & contacts with other economic ministries, other parastatal organisations involved with industrial development viz those dealing with investment, finance, technological consultancy, food, etc
- (iv) Improvement of domestic conditions for involvement, particularly of the package manufacturing and food packaging industries in the private sector in appropriate production programmes geared to the needs of the country.

- (v) Help, develop national technological consultancy service in packaging technology,

## 2.0. SURVEY OF TECHNOLOGICAL INSTITUTES

2.1. The Ministry is in the process of establishing a National Packaging Centre and may favour its establishment either at the 'INSTITUT NATIONAL DE LA NORMALISATION ET DE LA PROPRIETE INDUSTRIELLE (I.N.O.R.P.I.)' or at the 'LABORATOIRE CENTRAL'. Both these organisations are under the Ministry of Commerce and Industry and seem to be desirous of having the national Packaging Centre within their respective organisations. At the time of the mission, Mr Neil C. ROBSON, Senior Export Packaging Adviser of the International Trade Centre UNCTAD was carrying out a preparatory assistance mission for the establishment of a national Packaging Centre for fostering Quality improvement for exports to be set up.

2.2. LABORATOIRE CENTRAL : is a national test house under the Ministry of Commerce and Industry, endowed with the responsibilities of testing and analysis of various products for :

- a) quality control in all the economic sectors - industrial, commerce, agriculture, energy, construction,.....
- b) Certification of products' conformity to norms and specifications prescribed for the purpose.
- c) Detection of fraud and deception in products
- d) Controls needed for enforcement of Tarif Regulations, etc.....

The laboratory is well equipped in terms of expertise and testing equipment for carrying out testing and analysis of :

- (i) Food Products - Fruits, vegetables, processed foods
- (ii) Beverages - alcoholic & non alcoholic
- (iii) Microbiology & bacteriology characteristic of various products
- (iv) Metals & Minerals
- (v) Chemical products including paints, varnishes
- (vi) Cosmetics
- (vii) Textiles
- (viii) Cartons, Papers
- (ix) Plastics & Derivatives

- (x) Petrol, petroleum & other inflammable products
- (xi) Pesticides & Insecticides
- (xii) Tabacco, cigarettes
- (xiii) Products of electrical industry
- (xiv) Construction & building materials.

2.3 The laboratory also carries out tests & analysis for control of industrial pollution. In the field of packaging, material testing of paper and board, plastic films & containers physical properties of textile sacks, coating layers on metal sheets & reliability features of metal cans (to a limited extent) and glass bottles and compatibility studies on food products vis-a-vis packaging material used, etc... are being carried out in the laboratory.

2.4 The facilities for carrying out transport worthiness tests of completed and filled packages under simulated conditions of distribution hazards are extremely inadequate and need to be upgraded.

2.5 The management of the Laboratory are contemplating to upgrade their facilities for packaging material testing & analysis and may seek assistance for the training of their technical staff in some packaging laboratories of excellence. The laboratory, it is understood already enjoys a high level of technical acceptance by the industry and is envisaging to provide services of :

- a) Testing, analysis & certification for packaging materials and packages
- b) Training in the fields of quality assurance and improvements, and assistance to set up quality control laboratories in the manufacturers' premises
- c) Assistance in formulation of packaging standards particularly for food products
- d) Disseminate packaging - information.

3.0                    INSTITUT NATIONAL DE LA NORMALISATION  
                         ET DE LA PROPRIETE INDUSTRIELLE (INNORPI)

3.1                    INNORPI is a national Institute functioning under the Ministry of Commerce & Industry, with a Governing Council having representatives of different Ministeries and other interests. The Institute is concerned with the formulation of national standards and metrology services connected with quality improvements, protection of inventions, manufacturing & trade marks and property rights of industry. It has also the responsibility for certification of quality of products originating from local manufacture, imports & those meant for exports.

3. 2. PACKAGING CENTRE

The institute has formulated a plan for promotion of quality in the Tunisian Industries and evolved strategies for its implementation. The Institute is contemplating to have a national Packaging Centre as part of the strategy to improve quality of packaging material and packages needed for exports. The discussions held with the Deputy Director General (INNORPI) and the I.T.C's Senior Adviser export packaging, revealed that INNORPI have already formulated a project document to create a packaging centre and may seek UNDP's technical assistance under the country programme of technical assistance. Subsequent discussions with the Deputy Resident Representative, confirmed the contention.

3.3                    Currently INNORPI have a technical team of 21 qualified persons for various services but without any laboratory support. The expertise for formulation of national standards for packaging is extremely inadequate and needs to be strengthened. The Institute needs to train at least two technical member of their technical staff in the area of packaging standards.





The country spends nearly 7 million Dinars (US\$ 8.4 million) every year on import of plastic materials for production of packages needed for milk alone and paradoxically has a well developed glass bottle manufacturing industry with a sufficient surplus capacity. The urgency to use glass bottles for distribution of milk has been accorded high priority.

## 5.0 R E C O M M E N D A T I O N S

5.1 The Tunisian authorities are examining a proposal for upgrading the facilities of the Central Laboratory to develop and offer packaging services. Should such a decision be made, the laboratory may need assistance in the form of :

- 5.2 Training of a cadre of 8 technicians - two each in :
- (i) Product/Package, compatibility studies for food products
  - (ii) Performance testing under simulated conditions of distribution in the domestic and export markets
  - (iii) Packaging design - graphics & structurals
  - (iv) Quality control, testing, analysis of plastic materials.

### 5.3 EQUIPMENT

Facilities for transport worthiness testing laboratory should be created and the following equipment is recommended :

1. Drop Table - for large sized packages
2. Drop Table - for small packages
3. Drop table for sacks
4. Vibration table
5. Corrosion Chamber
6. Climatic Chamber
7. Inclined impact tester
8. Compression tester

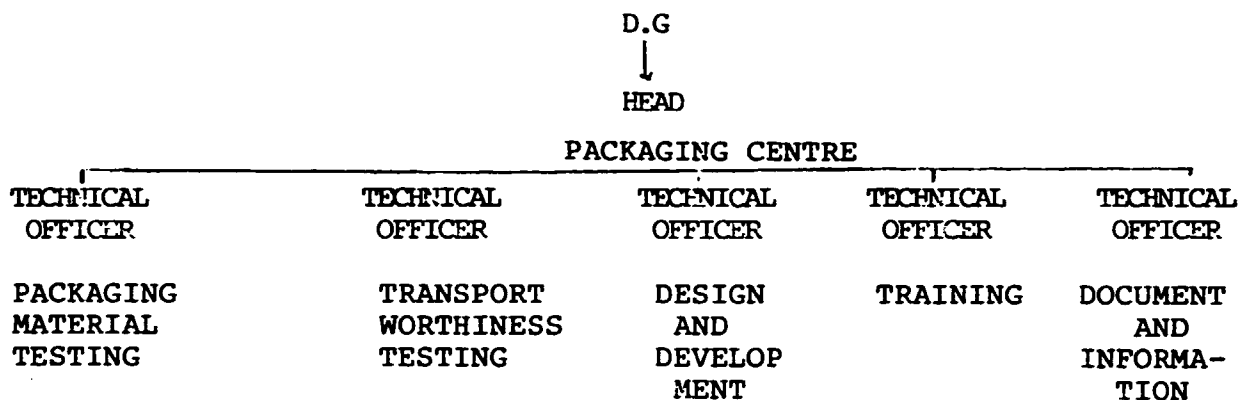
### 5.4 EXPERT MISSIONS

An expert mission for a period of two months by a packaging technologist with specialisation in transport worthiness test is

recommended to help erect the equipment and further train the national staff on transport worthiness tests, analysis & interpretation.

5.5 ORGANISATION

Organisationally, the packaging centre should have a departmental head directly reporting to the Director General of the Laboratory with arrangements to use the facilities of chemical, physical/mechanical properties testing already available. During the initial stages, the following organisational arrangement is suggested.



-MATERIALS

FOOD PACKAGING  
-Compability Studies

\* TECHNICIANS AS NEEDED IN DIFFERENT FUNCTIONS.

DOTTED LINES INDICATE SERVICES TO BE DEVELOPED after initiation of packaging testing and analysis.

5.0 FOR INNORPI

6.1 TRAINING

Fellowship training for two members of the technical staff on "packaging standardization" for a period of two months each is recommended.

6.2 EXPERT MISSIONS

An expert's mission by a packaging technologist with specialisation in the formulation of packaging standards for a period of two months is recommended.

6.3 COOPERATION

Pending creation of its own facilities, INNORPI can use the laboratory facilities / service of LABORATORY CENTRAL for testing, analysis & certification. The area of cooperation between the two organisations needs to be strengthened to their mutual advantages.

7.0 PACKAGING OF MILK

Technical assistance in the form of an expert's mission for packaging & distribution of milk & dairy products in glass bottles / containers for a period of two months is recommended.

YEMEN ARAB REPUBLIC

1.0. Focal points

1.1. The Republic's Ministry of Economy, Trade and Supply Department of Industry is the focal point for the promotion & development of the packaging industry. An officer of the rank of a Director Coordinates programmes aimed at the development of the packaging industries and overseas the needs of other economic ministeries and organisations. The country could not take any benefit of the on going project due to lack of information about project's activities and the extent to which the project's resources of expertise could be utilised and addressed to the needs of the Republic.

1.2. The country is hoping to bring about a big change in its economic programmes and is optimistic to usher in an era of economic restructuring by seeking and providing capital for the industry and agriculture, techniques & equipment to upgrade operational efficiency. The discovery of new oil and gas fields doubling the known petroleum reserves and country's prospects of becoming an oil producer may change the face of the economy of the country. Guided by this optimism, the Ministry is engaged in the formulation of plans particularly for import substitution. It is worthrealising, that the Republic imports all packaging materials and would welcome technical assistance that could help reduce its dependence on foreign sources and reduce imports.

1.3. The Ministry will soon have a CENTRAL LABORATORY FOR STANDARDISATION QUALITY CONTROL & METROLOGY. The laboratory is expected to be in full operation by Sept 1987. It is also contemplated that this laboratory will become the base for developing and offering packaging services of material testing, training, documentation and information.

## 2.0. SURVEY OF TECHNOLOGICAL INSTITUTES

- 2.1. In the Yemen Arab Republic, there are a couple of centres imparting vocational training to students after secondary education. In the context of the current and future programmes of work, faculty resources and inter relations with the industry, these will not be the strong sources to be sufficient for the development and distribution of packaging knowledge.
- 2.2. The Ministry of Economy, Trade and Supply have already decreed to establish a central laboratory for standardization, quality control and metrology and the premises to house the laboratory will be ready soon. It is expected to function by Sept 1987. The discussions with the Ministry's authorities revealed their strong desire to have services of packaging material testing, analysis, quality control and certification located in the Central Laboratory.
- 2.3. Initially, the focus may have to be on training of 4 technicians on packaging materials/package testing particularly in the field of paper & board, metal cans & glass, plastics and laminates.
- 2.4. The Central Laboratory, have already received testing equipment appropriate to the assessment of the properties of various products but may have to substantially upgrade their resources of equipment & expertise to be able to support packaging services of testing, analysis & quality control & certification. The interest and visible involvement of the Ministry's officials in the establishment of packaging laboratory to monitor the quality of food produced & imported into the country appears to be well justified specially in the absence of any food laws. In days to come, this laboratory may be required to help formulate packaging standards, train industry's personnel on packaging quality control and serve as a national resource for packaging related documentation & information service.
- 2.5. The Central Laboratory will require the services of a packaging technologist for a period of three to four months to help it set up package testing services and train local staff on technical aspects of testing, analysis & interpretation. In addition, its staff may

require advanced training on aspects of Quality control for packaging materials.

3.0. CENTRAL PUBLIC HEALTH LABORATORY : The Central Public health Laboratory assisted by W.H.O. is another organisation engaged, among other things, in the analysis of food and water with a view to protecting public health in the face of hazards of impurities and bacterial growth and incidence of infestation in these. The laboratory services are being used by different organisations particularly when the cases of food poisoning are suspected or detected. The laboratory's resources are not being used for food analysis on a routine basis.

3.1. This laboratory's micro-biological section is fairly well developed and can be utilised for food analysis and shelf life studies with the upgradation of expertise. The Laboratory's management feels the necessity of strengthening their resources of expertise & equipment to undertake the entire task of food analysis and would be willing to support packaging material's testing services for food packaging, if the national authorities could agree to utilise their services. In order to be fully equipped for such a task, the section on chemical analysis of food & requisite expertise have to be substantially upgraded. During the discussions, the need to have a packaging technologist for assisting the laboratory & its technical staff in testing of properties of packaging & foods & determination of shelf life studies was greatly emphasised by the respondents.

4.0. Promotion of Packaging Services - Identification of Needs for Technical Services :

4.1. Ministry of Agriculture : The infrastructural bottlenecks obtaining in the country are greatly affecting the efficiency of the distribution system by not only inflicting excessive damages & spoilage to the products but also creating temporary shortages due to late arrivals of few essential products and pushing the prices upwards. The authorities wish to have a recourse to appropriate technology and expertise that could improve the efficiency of the distribution system in the immediate future. The level of managerial and skill efficiencies need urgent improvements to stem inflationary rise in prices of food items.

4.2. In the field of packaging, with few exceptions, the country seems to be out of date in realisation of the importance of this industry in the expansion of domestic and export markets and accordingly is not giving the same significance as given to other important and key growth sectors of the economy. Somewhat contradictorily, products of agricultural sector face immense problems in the markets and the incidence of product losses particularly of the fresh vegetables, fruits, fish, meat, even cereals is high....

4.3. The role of packaging in the minimisation of product losses, expansion of markets and more efficient use of the transportation, storage systems was highlighted by the consultant during the discussions held with some of the key functionaries of the Ministry. It was emphasised that the development of the packaging industry should be given its due place in the new policies and programmes for economic restructuring of the country, which are at various stages of formulation.

4.4. On the export front, the ministry is anxious to expand exports of agricultural products to the neighbouring Arab Countries and realises the need for improved packaging for a turn around in performance. The main conclusions emerging out of the discussions and assessment relate to :

- (i) Develop & improve packaging standards for fresh fruits & vegetables ;
- (ii) Assess demand forecasts for packaging materials & inventory of capacities at the national level, identify investment opportunities in the field ;
- (iii) Assist in the production of a film on methods of packaging including filling, closing, handling & stacking of transportation of fresh fruits & vegetables to assist in the extension programme of education of the farmers.

5.0. Yemen Chamber of Commerce The Yemeni Chamber of Commerce feels the necessity for having a national plan for packaging material for the country. In their opinion, this plan will greatly enable the food



packaging and other package user industries formulate their production plans and devise strategies to procure packaging materials and packages from the domestic resources & imports. The Chamber feels that the technical assistance must aim at the real transfer of expertise in the context of the needs of the Yemen Arab Republic, particularly in relation to development of national skills to set up packaging material converting industries. They feel that a systematic survey to assess the extent of domestic resources, technical, scientific and technological available in the country together with demand forecasts for different types of packaging material.

5.1. The country's export potentials to S. ARABIA and other members of the Gulf Cooperation Countries; Somalia, Sudan, Djibouti are expected to improve, if the packaging designs and specifications for the products produced and or manufactured in the country could be improved. Often, the chamber is required to certify the quality of the products exported to many of the destination in the GCC. The Chamber neither possesses the resources to certify the quality of product nor the packaging materials used.

The Chamber expects to receive regular assistance regarding the certification of products & packages from the central laboratory for standardisation, quality control & metrology under inception.

#### 6.0. Recommendations

National capacities need to be built up through technical assistance in the following areas.

##### International Experts

- |  |       |
|--|-------|
| (i) Expert on Establishment of Packaging Laboratories                            | 3 m/m |
| (ii) Expert on Testing of Metal Cans & Glass bottles                             | 1 m/m |
| (iii) Expert on testing of Flexible packaging materials - plastics paper & board | 2 m/m |

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- |   |       |
|---|-------|
| (iv) Expert on Packaging Design -<br>Graphics and Structural - for<br>Exports         | 2 m/m |
| (v) Expert on Production of film on<br>'Packaging<br>ITS ROLE IN DISTRIBUTION SYSTEM' | 3 m/m |

Fellowship training

- |  | N° |       |
|--|----|-------|
| (i) Packaging Material Testing -<br>metal & glass                            | 2  | 3 m/m |
| (ii) Packaging material testing -<br>plastics / paper & board &<br>laminates | 2  | 3 m/m |
| (iii) SHELF LIFE STUDIES ON FOOD<br>PRODUCTS                                 | 2  | 3 m/m |

During the debriefing meeting with the Resident Representative (Mr AZAM) UNDP Office Sanaa, the consultant was advised to develop a project concept for technical assistance in the field of packaging so that a sizeable part of the assistance programme could be covered to answer the priority needs of the packaging industry in the country through the IPF. Accordingly, a draft project concept was developed & submitted to the RR copy enclosed (Annex I).

In the event of the assistance forthcoming through the country programme, a sizeable portion of the country's requirements would be met, save for a few special activities that may underscore the Regional Programme.

ANNEX I

PROJECT CONCEPT

**TITLE** : ESTABLISHMENT OF A PACKAGING TESTING AND QUALITY CONTROL LABORATORY.

**COUNTRY** : YEMEN ARAB REPUBLIC

**BACKGROUND** : Development of a modern packaging industry is essential for a more efficient distribution of industrial and agricultural products in the country. The country's economy heavily relies on agricultural sector whose products contribute nearly 20 per cent to the GDP and engages about 70 per cent of the population. More than 90 per cent of country's exports is accounted for by the products of agriculture.

The Republic's infrastructure of transport, roads, handling and storage suffers from a number of inadequacies which not only limits the size of the domestic market but also leads to formidable losses suffered particularly by fresh fruits & vegetables, fish & sea foods, milk & dairy products in the distribution system. As much as 30 per cent of fresh fruits & vegetables, it is estimated, fail to reach the destination markets and are spoiled & damaged beyond the use worthy conditions. Much of these losses can be prevented by improvements and upgradation of packaging standards, and training of all concerned in the techniques of handling, filling, closing of packages. Unfortunately, the current status of the packaging industry in the country and scientific knowledge available is not adequate to facilitate effectively the distribution system and help conserve the scarce resources of the country.

The Govt has expressed a great sense of urgency and anxiety to boost its exports to the neighbouring countries in the Arab region, much of this enthusiasm needs the backing of scientific knowledge, the techniques & technology to effectively harness the potential that exist for the export. Development of packages suitable to the needs of the importing countries can substantially contribute to the export efforts of the country. To achieve success in the field will essentially require strengthening of technology of packaging for the domestic market and extension of its benefits to design packages for export.

JUSTIFICATION

Establishment of a nucleus in the form of a packaging material testing laboratory will initially be essential for quality assessment and improvements of the packaging materials used in the country. In addition, technical assistance addressed to the needs of developing packages for fresh fruits & vegetables and export will contribute to minimisation of losses in the domestic markets & promotion of exports as applicable.

Development Objective: Development of a modern packaging industry will greatly help achieve a more efficient distribution of agricultural and industrial products and expansion of the domestic and international markets of the country. In addition, it will serve as an important tool in more efficient use of the transportation & storage resources of the country and help realise the aims of the food security programme by minimisation of food losses.

- Immediate Objectives:
- (i) To establish a packaging material testing laboratory duly equipped with testing equipment and trained technicians.
  - (ii) To upgrade packaging standards, designs, graphics & structurals for a couple of selected products for exports to target overseas markets.
  - (iii) To design and develop packages for fresh fruits and vegetables with a view to minimising distribution losses in the country.

- Outputs
- (a) A functional packaging material testing laboratory capable of testing the specification of containers/packages made of plastics, metals, glass, paper & board.
  - (b) A study of prototypes of improved packages for two/three selected products in the context of pre-determined requirements of a group of target overseas markets.
  - (c) A report of prototypes, specifications for appropriately developed packages for fresh fruits & vegetables to withstand the hazards of distribution - climatic, mechanical, microbiological etc, obtaining in YAR.
  - (d) Improved skills of technical persons to perform testing of packaging materials in the context of requirements for quality control.
  - (e) A documentary short film 'on role of packaging in distribution system in Arabic - for extension services to farmers and other sector functioning in unorganised sectors of the economy.

Inputs: To achieve the outputs outlined in the foregoing; technical assistance in the form of international experts, fellowship training and equipment will be required within an estimated outlay of 215,500 US\$.  
Broad breakdown of the assistance is as:

... 3/.

(1) INTERNATIONAL EXPERTS:

		US\$
(a) Expert on establishment of packaging laboratories	3 m/a	25,500
(b) Expert on testing of metal cans & glass bottles	1 m/a	8,500

		US\$
(c) Expert on testing of flexible packaging materials plastic/paper board	2 m/a	17,000
(d) Expert on Packaging Design Graphics & structural for exports	2 m/a	17,000
(e) Expert on packaging of fresh fruits & vegetables	2 m/a	17,000
(f) Expert on production of film packaging its role in distribution system.	3 m/a	25,000
		=110,500

(2) FELLOWSHIP TRAINING

	NO	m/a	
(i) Packaging material testing- metal/glass	2	3	15,000
(ii) Packaging material testing plastic/paper board & laminates	2	3	15,000
(iii) Shelf Life Studies on Food Products	2	9	15,000
			=45,000

(3) Packaging Material Testing Equipment for plastic/metal can/glass/paper & board

		60,000
1 + 2 + 3	=	215,500

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