OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

105p.
tables

RESTRICTED

DP/ID/SER.A/1766
18 July 1966
ORIGINAL: ENGLISH

21650

RISK REDUCTION IN THE DEVELOPMENT OF AGRO-CHEMICALS IN THE AFRO-ARAB REGION

Technical report: Preparatory phase findings and recommendations*

Based on the work of

Messrs. Klaus Ziller and Marc Donnez
(Arab Region)
Vol. 1

Project Manager: B. Sugavanam
Chemical Industries Branch

United Nations Industrial Development Organization
Vienna

---

* This document has not been edited.

V.96 84992

2

TABLE OF CONTENTS

ACKNOWLEDGEMENT

The mission comprising of Messrs. Klaus Ziller(Germany), Marc Donnez(Belgium), Ferenc Kovats(Hungary), and Julius Menn(USA) visited various countries in the Africa and the Arab regions . The information collected and presented in the two volumes was possible due to the extreme cooperation from the UNDP/UNIDO Offices, different governmental , inter-governmental, semi- and non-governmental organizations. The authors place on record their deep appreciation and gratitude to all the persons they met who gave their time and expertise to provide the necessary information. It was also heartening to note that the countries were very appreciative of the UNIDO initiative to set up the Network which they think would definitely assist them in reducing the risks associated with production and use of agrochemicals.

Preface

An Expert Group Meeting to discuss ways and means of Risk Reduction in the Development of Agrochemicals in the Afro-Arab Region is scheduled to take place in Mauritius during the third quarter of 1996 , with the aim of establishing an Afro-Arab Network. Such a meeting would address to Chapter 19, of Agenda 21, on Sound Management of Toxic Chemicals.

In order to collect all the necessary information for discusion in the Expert Group Meeting a preparatory phase was initiated in which a team of experts visited several countries in the region with the aim of assessing the existing capabilities within the countries and identifying possible focal points for coordination of the network.

The report presented in two volumes summarizes the findings and recommendations of the team of experts who covered a number of countries in the Afro-Arab Region. The following countries are covered for the starting of the network.

Africa region: Nigeria, Ghana, Kenya, Zambia, Zimbabwe, and Mauritius

Arab region: Morocco, Tunisia, Egypt, Syria, Lebanon and Saudi Arabia

Countries such as Tanzania, Malawi and Uganda were covered by UNIDO separately. In addition, Kuwait and West Bank and Gaza Strip are also included.

The teams had discussions with government officials, industry, universities, and nongovernmental organizations dealing with pesticides and fertilizers in order to gather information and assess the situation and needs of each country.

The country reports are structured as follows:

- **Section A:** Agriculture Profile
- **Section B:** Pesticide Supply and Production
- **Section C:** Key Actors involved in pesticide sector organization
- **Section D:** Participation in the Afro-Arab Network

Annexes are kept to a minimum in order to limit the size of the document. Despite all possible efforts some of the categorized information is still lacking but will be completed later before the Mauritius meeting.

LIST OF CONTACTS

Generally, and as far as possible, the following groups were visited as a routine in each country:

- ***Ministry of Industry***
- ***Ministry of Agriculture***
- ***Ministry of Health***
- ***Ministry of Environment***
- ***Universities***
- ***Pesticide Industry***
- ***Pesticide Sector Associations***
- ***Environmental Associations***

- ***FAO***
- ***WHO***
- ***UNDP***
- ***OTHERS***

As the list of contacts is quite voluminous it is put as an annex to this report.

LIST OF ABBREVIATIONS & ACRONYMS

CEHA	Regional Center for Environmental Health Activities
CIPAC	Collaborative International Pesticides Analytical Council Limited
FAO	Food and Agriculture Organization
GAP	Good Agricultural Practice
GDP	Gross Domestic Product
GIFAP	International Group of National Associations of Manufacturers of Agrochemical Products
GLP	Good Laboratory Practice
GTZ	German Agency for Technical Cooperation
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
NGO	Non Governmental Organization
MOA	Ministry of Agriculture
MOE	Ministry of Environment
MOH	Ministry of Health
MOI	Ministry of Industry
PIC	Prior Informed Consent procedure of FAO
RENPAP	Regional Network on Pesticides for Asia & the Pacific
TCP	Technical Cooperation Project
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Programme
USAID	United States Agency for International Development
WHO	World Health Organization

MEASURES:

sqm	square meters
ha	hectare (1 ha = 0.1 square Km)

CURRENCY:

DH	=	Moroccan Dirham	1 USD = 11 DH
TD	=	Tunisian Dinar	1 USD = 0.91 TD
L.E.	=	Egyptian Pound	1 USD = 3.3 L.E.
SYP	=	Syrian Pound	1 USD = 37 SYP
LL	=	Lebanese Pound	1 USD = 1.68 LL
JD	=	Jordanian Dinar	1 USD = 0.7 JD
SR	=	Saudi Rial	1 USD = 3.7 SR
USD	=	U.S. Dollar	

EXECUTIVE SUMMARY

Objectives and approach of the Mission

In preparation for the Expert Group Meeting on Risk Reduction in the Development of Agrochemicals in the Afro-Arab Region in summer 1996 the mission had to assess the pesticide related situation in six selected countries in the Arab Region and identify possible focal points for network coordination, institutions to be linked and facilities that could have model character for the region.

To review and assess the existing situation in the Arab countries with respect to pesticide use, residue monitoring, formulation control and legal aspects, the mission visited and interviewed more than 160 persons in Morocco, Tunisia, Egypt, Syria, Lebanon, Jordan and Saudi Arabia. This included key persons from several ministries, governmental and non-governmental organizations and also private institutions.

Findings of the Mission

1. MOROCCO

Morocco is an agriculture dominated country with four crops (wheat, barley, beans and sugar beet) accounting for about 80% of the cropland use. There is no IPM programme in place and pesticides are used intensively, mainly insecticides. Less than 15% of the pesticides are locally formulated with decreasing tendency.

An urgent problems is the huge stocks of 25-30 years old pesticides that need to be decontaminated.

Needs: improvement of pesticide legislation, especially for household pesticides; improvement of extension services; expressed need for assistance in pesticide waste management.

Possible contributions could come through the project and training center 'Section Technique d'Application' dealing with pesticide application techniques.

2. TUNISIA

With natural resources being scarce the country depends on industry, services and agriculture. Two crops (wheat and barley) and olive plantations represent two third of the cultivated area. Pesticide usage is dominated by the use of insecticides in fruit crops and herbicides in cereals. Only one company formulates agricultural pesticides locally. A lot of effort is being devoted to reduce the use of pesticides while maintaining the overall efficacy of chemical control of pests. Pesticide legislation is new but does not include non-agricultural pesticides. Pesticide quality control and residue analysis is done in the MOA. The environmental sector gets good attention. Existing problems are analyzed and strategies are formed. An eco-tochnological center is presently being completed. Generally there is broad institutional infrastructure.

Needs: access to information and new technologies; use of modern pesticides and reduction of doses per ha; improved application techniques; promotion of IPM

Possible contributions could come from the MOE and its 'Centre d'Ecotechnologie Tunisie' which has interesting premises that might be made available to the Network.

3. EGYPT

The country is characterized by intensive agriculture with 36% of its population and a proportion of about 40 % women active in it. Cotton, the country's largest agricultural export, is now slightly declining while production of cereals, fruits and vegetables is increasing. Several IPM programmes are in place. An impressive success in cotton, where consumption dropped from 18,000 tons in 1989 to 4,500 tons in 1994 was reported due to the implementation of IPM anlong with removal of subsidies and change in application technology. There are around six local pesticide formulators, amongst them also one producer. Pesticide usage is high and environmental authorities are very concerned. A new environmental law strengthened the Egyptian Environmental Affairs Agency as the focal point for related issues.

Needs: improvement of agricultural practices; financial resources for further development of new formulation types; incentives for the introduction and registration of modern pesticide formulation types; possibly assistance for detoxification of old pesticide stocks; waste management.

Possible contributions could come from the MOA's pesticide residue laboratory; from the pesticide industry (NCIC); EEAA; Alexandria university for formulation development; drastic pesticide reduction through IPM and other measures could be an interesting case study.

4. SYRIA

The traditional economical base is agriculture which over the past years secured food supply for its population and contributed more than 30% to the GDP. Wheat and barley account for nearly 2/3 of the cultivated area and cotton yields are world best after Australia. IPM programmes are run successfully in citrus, cotton, apple and olives and resulted in drastic reduction of pesticide use from 4,500 tons in 1985 to 1,700 tons in 1994 (governmental sector). The withdrawal of price subsidies contributed to that. Pesticide supply is mainly in the hands of the government with a selected and limited number of products.

Needs: new legislation (pesticides including public health and household pesticides, environment); improve infrastructure, e.g. establishment of a residue laboratory for agricultural use; expressed needs for access to technical and commercial information as well as to technologies.

Possible contributions could come from the MOA's Douma center which has a big auditorium with full facilities for 200 people. Success in biological control and other IPM methods could serve as case study.

5. LEBANON

Twenty years of war have led to severe damage of infrastructure and productive stock throughout the country. Fields and irrigation networks were destroyed and farm equipment stolen. Most facilities for data collection and evaluation were destroyed as well. In this sense the country could benefit most from the network.

Needs: general rebuild of infrastructure, introduction of comprehensive legislation, improvement of agricultural practice and technologies, training, expressed needs for assistance in waste management of toxic chemicals.

Possible contributions could come through the Sustainable Development Network Programme (SDNP), is a cooperation between UNDP and the MOE.

6. JORDAN

Agriculture still holds a position of importance in the economy despite the continuing decline in its relative contribution to GDP, employment and trade. The Jordan Valley is characterized by intensive agriculture under irrigation with high pesticide inputs. The number of local pesticide formulators has increased from 4 to 14 companies over the past years, many of them producing for export. A good infrastructure exists for pesticide analysis, but new legislation is not fully adopted yet. IPM projects started recently. Government wishes to reduce amount of pesticides used and improve waste management. A new environmental law was passed in 1995.

Needs: full adaptation and implementation of the pesticide legislation and the pertinent rules and regulations; improvement of agricultural practices, expressed needs for pesticide R&D of new formulation types, better information access and waste management.

Possible contributions: RSS is very interested to take the national coordination with the NIC to provide the required infrastructure. The MOA suggests their well equipped Center for Pesticide Residue Analysis and Formulation Control to become a technical focal point for the region. The MOH together with WHO have the Regional Center for Environmental Health Activities (CEHA)

7. SAUDI ARABIA

Originally based on subsistence agriculture, economic structure has drastically changed since the discovery of oil, which provides the main source of government finance and foreign exchange, and oil production became the dominant component of GDP. Nevertheless huge sums were allocated to agricultural development in an attempt to reduce its reliance on imports. Pesticide inputs used to be quite high. IPM programmes started 3 years ago with the expressed wish to reduce the amounts of pesticide. A good institutional infrastructure exists for most sectors.

Needs: improvement of pesticide legislation; extending pesticide quality control to include physico-chemical

testing; expressed need for information access related to pesticides and public health and the environment;

Possible contributions could come through the Meteorology and Environmental Protection Administration (MEPA) offering to become the focal point for all environmental issues and willing to take role as national coordinator. The Information Service Department of the King Abdulaziz City for Science & Technology will be happy to provide the necessary infrastructure within the country.

Comments on technical issues

A. The general awareness and understanding towards the risks and hazards associated with the use of agrochemicals has increased. Some countries are aware that misuse of pesticides has caused a lot of damage in the past. Several countries are thinking of possibilities and strategies to reduce such risks.

B. The team found also that in some countries there is a recognition of IPM and in many countries also registration requirements based on the FAO Code of Conduct. The proposed Network will make the necessary linkages with this activities. The Network, however, should put emphasis on bio/botanical pesticides and other low risk pesticides to complement IPM.

C. In most countries women are involved a great deal in agriculture. Though data on their direct involvement in pesticide use and application were not readily available, some reports indicated that there is a high risk for women and children being involved for example in harvesting, often being done shortly after or even on the same day of spraying. Concerns were raised also about small children accompanying their parents and playing around on the farm, sometimes in sprayed fields or with empty pesticide containers.

D. The increased use of fertilizers has raised concern to environmental authorities in several countries. Ground water contamination is also feared by the combined application of fertilizers and pesticides through irrigation systems, but actual data from monitoring are scarce. Apart from ground water contamination high fertilizer use may cause problems with eutrophication of water ways (e.g. Egypt).

E. The problem of disposal of empty pesticide containers was raised in many countries. There is also a major international concern and the proposed network should look into the ways and means of eliminating or reducing the risks associated with the misuse of containers.

F. In several countries seed multiplication programmes or projects existed (e.g. Egypt, Jordan). They usually have facilities for seed treatment which, however, are not available to all farmers or in all areas. Small and medium scale farm holders do not have much access and normally use farm retained seed.

G. Generally concerns about toxic chemicals have increased considerably. Many countries started inventories of all chemicals entering to/or being used in the country. Information starts to exist ranging from simple listings and reports over databases to mappings. Countries expressed their wish for assistance in risk assessment and technologies for waste management.

H. In the field of formulation technology, unfortunately, most local formulators stick to old technology and/or do not get any incentives for introducing modern and less toxic types of formulation. Few countries, however, have replaced some EC formulations by water based formulations of the same active ingredient. In Jordan for instance some formulators started some in Research & Development for water based formulations. On the contrary, in Egypt the pesticide industry complained that replacement of EC formulations by less hazardous water based formulations is not done as is would require complete new registration including all testing which is expensive and time consuming (up to 5 years).

I. Occupational health and safety problems were unfortunately reported or encountered in many countries. Safety of workers in production or formulation facilities is often not up to standard and needs considerable improvement.

K. Though pesticide related legislation exists in many countries, implementation is often different or difficult. Generally a harmonization of pesticide registration requirements (as promoted also by FAO) is desirable, combined with incentives for replacing old types of products and formulations by newer and safer products, often being more effective at lower rates of application (low volume high activity products).

Conclusions and Recommendations of the mission

1. The planned network received much attention and unequivocal support. In some countries this enthusiasm is marked by the competition between ministries or organizations to take the leadership and become national coordinator for the network.

2. In some countries questions were raised towards the participation or inclusion of other countries in the region. Egypt and Jordan for instance commented that Israel and other neighboring countries should be included, Tunisia pointed out the importance of extending the services of the network to all African countries, specifically the poorer ones in the region.

3. The network should benefit from the experience made by RENPAP and should also be hooked-up or interconnected with other similar networks or data bases in the world. This could possibly be done through the SDNP programme of UNDP.

4. The technical possibilities and requirements for effective communication and relay or access to information according to newest technical standards should get proper attention and should be highlighted.

5. In the Expert Group Meeting in Mauritius, RENPAP should present and report on their experience with the network. Also other organizations such as FAO, WHO, UNEP, METAP and others should summarize and present their activities related to the field.

6. Also pesticide industry should take an active part in the Mauritius Meeting and present their point of view.

7. Structure of the Network, activities and financial support as well as cooperation and interaction with other regional or international organizations should be highlighted again as this was of general concern for most countries.

8. Each country that would like to become a technical focal point for a certain topic should be invited to give a poster presentation of existing facilities in that field.

INTRODUCTION

BACKGROUND OF THE MISSION

An Expert Group Meeting for the Risk Reduction in the Development of Agrochemicals in the Afro-Arab Region is planned for 1996 in Mauritius with the aim of establishing an Afro-Arab Network in that field. This project addresses Agenda 21, Chapter 19 on sound management of toxic chemicals.

OBJECTIVES OF THE MISSION

This mission is to be seen as part of a preparatory phase for the above Expert Meeting in Mauritius and the establishment of such network in the Afro-Arab region.

The objectives of the mission were:

- to assess the existing capabilities in the region
- identify possible focal points for network coordination
- identify institutions to be linked to the network
- discuss possible contributions of the countries

Apart from that technical focal points, so to say 'Centres of Excellence' that could have model character for the region were to be described.

APPROACH AND PROGRAMME OF THE MISSION

To review and assess the existing situation in the Arab countries with respect to pesticide use, residue monitoring, formulation control and legal aspects, the mission visited and interviewed more than 160 persons in Morocco, Tunisia, Egypt, Syria, Lebanon, Jordan and Saudi Arabia. This included key persons from several ministries, governmental and non-governmental organizations and also private institutions.

Data collection in some countries turned out to be rather difficult as the mission was faced with quite an inconsistency in data collection methods, documentation and presentation.

Four experts were divided into two teams one covering the African Region and the other team covering the Arab Region.

The following countries were visited during November and December 1995:

AFRICA REGION:	Nigeria, Ghana, Kenya, Zambia, Zimbabwe and Mauritius
ARAB REGION:	Morocco, Tunisia, Egypt, Syria, Lebanon and Saudi Arabia

The teams had discussions with Government officials, industry, universities and non governmental organizations dealing with pesticides in order to gather information and assess the situation and needs of each country.

In the mission for the Arab Region M. Donnez joined fully for Tunisia and Egypt and also partly for Morocco and Syria.

The country reports are structured as follows:

- section A: **Agriculture Profile**
- section B: **Pesticide Supply and Production**
- section C: **Key actors involved in pesticide sector organization**
- section D: **Participation in the Afro-Arab Network**

Annexes were kept at minimum in order to limit the size of the document.

MOROCCO

Population :	27 millions
Active population in agriculture :	40 %
Proportion of women in agriculture	15 %
GDP per capita :	1,200 USD
Contribution of agriculture to GDP :	14 %

A. Agriculture profile

in '000 ha

• Field crops		5,900
of which cereals	5,010	
pulses	320	
industrial crops (sunflower, sugar beet, sugar cane)	400	
fodder	170	
• Vegetable crops		200
• Tree crops		660
of which citrus	75	
grapes	30	
• Other cultivated area (fallow)		2,440
• Cultivated area		9,200

Surface under irrigation 900,000 ha
Surface under greenhouses 200,000 ha

1. Four crops account for about 80 % of cropland use : wheat, barley, beans and sugar beet. Most of agricultural land is found in the littoral regions with the Gharb plain playing an important role in agricultural production as it hosts most of the modern, large-scale farms.

2. No IPM programme is currently under implementation.

3. Pesticide applicators are generally casual workers with low education and training, and low awareness of hazards. Women are hardly involved in the application of pesticides, this task being still considered as a man's task.

4. Pesticide usage pattern :

- *Breakdown by pesticide type*

  - 45 % insecticides used mainly in tree crops
  - 30 % fungicides used mainly in vegetables, fruits and grapes
  - 15 % herbicides for weed control in cereals
  - 10 % others

- *Breakdown by crop*

  - 40 % on tree crops
  - 25 % on vegetable crops
  - 20 % on cereals
  - 10 % on industrial crops
  - 5 % others

Present pesticides consumption varies around 6 to 8,000 tons/year depending heavily on the climatic conditions and the rainfalls in the non irrigated sector. The stagnation in pesticide usage recorded these last years is due more to droughts than to economic reasons or to better pesticide efficiency.

B. Pesticide supply and production

1990	49 mio USD
1991	53 mio USD
1992	45 mio USD
1993	40 mio USD
1994	40 mio USD

Number of pesticides registered : 1250
Number of active ingredients registered : 300

Only 1/4 of the pesticides registered are actually commercialised.

1. Twelve companies are currently supplying the pesticide sector with Bayer, Ciba Geigy, Rhone-Poulenc, Amaroc, BASF and Zeneca, being the major ones :

   - Bayer[1] closed its formulation facilities for economic reason and maintained only its repackaging activity (although it tends also to phase out due to existing production capacities in Spain and Portugal).
   - Ciba Geigy is presently the only company having facilities for formulating pesticides at a (small) industrial level.
   - It is claimed that few other companies and dealers probably make sporadic formulation, dilution and/or repackaging (mainly) of marginal quantities of pesticides.

   It is estimated that less than 15 % of the pesticides are formulated locally.

2. *Ciba Geigy Morocco*, Casablanca, has facilities to formulate EC products and to make the repackaging of powders. Around 1/4 of their needs are produced locally in facilities matching the mother company's high standards. Because every raw material has to be imported and because high costs are generally associated in running small formulation unit at high standard, the formulation is judged to be hardly profitable. The plant is running below its capacity and kept only for strategically reasons.

3. *The Association Marocaine des Negociants Importateurs et Formulateurs de Produits Phytosanitaires* (AMIPHY) groups the 12 companies active in the pesticides sector and wishes to develop a collaboration with the authorities, the research institutes and the specialised organisms, to fight against the existing smuggling and pirating, improve the sector and contribute to the safe use of pesticides.

   The association covers 80 % of the market. It is not yet member of the GIFAP association.

4. One of the biggest problem that has been addressed is the huge stocks of 25-30 years old pesticides, the use of which is now forbidden. Products are stored in 6 different locations in South Morocco (1,550 tons) and formulated as technical HCH, i.e. :

   - 760,000 lit γ HCH at 10 and 15 % in mineral oil
   - 460,000 kg γ HCH at 3 % dust powder
   - 330,000 kg γ HCH at 0.05 % on wheat as bait

   Their incineration in cement factories has been envisaged and studied by GTZ and USAID in 1991, but not yet resolved. The total stock of expired pesticides used mainly in antilocust campaigns, accounts now for 2,200 tons, 90 % being organochlorine compounds.

C. Key actors involved in the pesticide sector organisation

1. Ministry of Agriculture

- *Direction de la Protection des Végétaux, des Contrôles Techniques et de la Répression des Fraudes.* 2 divisions :

Division des Contrôles Techniques et Phytosanitaires :

- main tasks :
  - control of seeds and plants
  - registration of pesticides
  - residue analysis for export of agricultural products
  - phytosanitary control
  - agricultural warnings
- priority concerns :
  - the detoxification of the huge stocks of expired pesticides used for the antilocust campaigns
  - the lack of legislation regarding household pesticides
- major topics discussed :
  - a new legislation (being worked out since 1986 !) regarding the commerce of pesticides is being prepared. It will replace the old legislation based on 2 decrees of 1922 and 1953 which got in the mean time several additions.
  - the fierce competition on export markets made aware the agricultural product exporters to residue analysis to match the severe norms for export.

Division de la Répression des Fraudes :

The division is conducting systematic analysis of every pesticide imported before release for sale. The analysis of samples is performed by the LOARC.

- *Laboratoire Officiel d'Analyse et de Recherches Chimiques (LOARC), Casablanca*

The laboratory which is a partly subsidised semi-public establishment, is, among others, the only official body for coping, at a fee, with pesticide formulation and residue analysis for the Ministry of Agriculture (Division de la Répression des Fraudes), the Customs and private exporters.

About 20,000 samples are analysed each year of which 17,000 are for the Division de la Répression des Fraudes, 1,000 for pesticides registration and 1,000 for residue analysis. Moroccan norms and regulations being weak, the laboratory uses the international norms, standards and analysis procedures.

The laboratory is correctly equipped and organised. It is regularly checked for conformity by GTZ.

- *Section Technique d'Application*

The Section Technique d'Application is a project assisted by GTZ, dealing with pesticide application techniques and aiming at testing the equipment, training the farmers and advising on spraying techniques and equipment maintenance. The centre has excellent facilities to train farmers with a large panel of different equipment : more than 15 knapsack sprayers, ramp testing for tractor mounted sprayers, mistblowers, etc. It also developed interesting didactic tools (leaflets, videos, TV programmes,...) for farmers training.

The centre is considered as one of the best in the region and could become one of the focus point of the Network in application techniques. In the future, it is intending to turn to IPM implementation.

2. Ministry of Public Health

- *Division Hygiène du Milieu*

This division takes care, among others, of urban sanitation, rural health and fight against vectors of disease. Their current major concerns are

- the late research and lack of suitable legislation regarding pesticides used in public health, and

- a punctual but tough problem of CS_2 stocks detoxification which is located in an urban area

All the laboratory work needed by the division, is handled by the Institut National d'Hygiène.

- *Institut National d'Hygiène*

  The institute is the only laboratory dealing with human toxicology and control of water quality. Analysis of residue is regularly realised when food poisoning is reported. Pesticide poisoning is claimed to come first in more than 40 % of cases. Probably the use of pesticides to commit suicide, is adding to the high proportion of poisoning.

3. Ministry of Environment

The ministry was created recently and started by installing a network of stations throughout the country to monitor the pollution of the environment. Pollution with pesticides is a major concern although only casual pollution is reported and diffuse pollution not yet recorded.

D. Participation to the Afro-Arab Network

1. Motivation to participate to the Afro-Arab Network is found generally high from all the organisations visited, and many parties have shown good willingness to take an active part to its realisation.

2. Surprisingly some concerns came from the Direction de la Protection des Végétaux. Their concerns are :

   - the origin of the initiative and the possible duplication of such a network with some other FAO projects,
   - the tendency for meetings to meet for the sake of having a meeting without getting clear and sensible results,
   - the efficiency of the activities that the Network may achieve and the actual outcome that can be derived by the participating countries,
   - the fear tha the Network will keep them away from the assistance and experience that industrialised countries may grant.

3. Major problems addressed to the team are :

   - the huge stocks of expired products that are existing,
   - the lack of legislation regarding non agricultural pesticides,
   - the fight against smuggling and pirating, and the weak protection the current legislation is actually giving against certain distributors having but a limited experience in the pesticide business,
   - the lack of reliable information and statistics,
   - the poor extension of farmers,
   - the long delays to launch the new legislation.

   Apart from the very punctual and actual problem of expired stocks detoxification, Morocco is primarily behind in terms of legislation and the organisation of the pesticide business. In that sense the country can benefit from the experience of the other countries throughout the Network.

4. The Network receives full support of international organisations like the FAO.

   The team recommends to consider the *Section Technique d'Application* as a focal point for the Network in application techniques.

   Ideally, considering the problems addressed, the national coordination should be handled by the Direction de la Protection des Végétaux, if concerns can be lifted and motivation be restored. Alternative national coordination can nevertheless be found easily

TUNISIA

Population :	8.5 to 9.0 millions
Active population in agriculture :	25 %
Proportion of women in agriculture	15 to 20 %
GDP per capita :	1,850 USD
Contribution of agriculture to GDP :	16 to 18 %

A. Agriculture profile

in '000 ha

• Field crops		2,000
of which cereals	1,550	
pulses	110	
industrial crops	20	
fodder	320	
• Vegetable crops		150
• Tree crops		2,000
of which olives	1,400	
almonds	300	
citrus	15	
• Other cultivated area		400
• Cultivated area		4,550

Surface under irrigation	300,000 ha
Surface under greenhouses	1,500 ha

1. Two crops dominate Tunisian agriculture, the cereals —mostly wheat and barley— with around one third of the total cultivated area and olive plantations that account for another third of the arable land and make Tunisia one of the largest producers and exporters of olive oil. Other crops of some importance are vegetables, citrus fruits, sugar beets and dates.

Total arable land reaches 5 millions ha and is spread over 3 zones, i.e. :

- the North zone, where most of the wheat is grown intensively, along with citrus,
- the Central-Sahelian zone, where mainly low yield cereals and olives are grown, and
- the South zone mostly dedicated to date palm growing.

Rainfed agriculture predominates although important irrigation projects have recently been launched to make the country less vulnerable to droughts. The potential area for irrigation is estimated at nearly 575,000 ha.

2. About 15 to 20 % of workers in agriculture are women, mostly involved in harvesting and fruit sorting. Pesticide treatment is still considered as a man's activity.

3. Although agriculture continues to suffer from low levels of mechanisation, the use of fertilisers, pesticides and improved seeds slowly increased in recent years.

   Pesticide usage is dominated by the use of insecticides in thē fruit crops and herbicides in cereals. The surface treated with herbicides (mainly 2 herbicides are being sprayed i.e. 2,4-D and a polyvalent herbicide : Illoxan) varies much from 170,000 ha to 400,000 ha and depends mostly on the rainfalls

4. Pesticide usage pattern :

   - 35 % insecticides used at 80 % in tree crops (olives and citrus).
   - 35 % fungicides used at 80 % in vegetable crops and grapes.
   - 25 % herbicides used at 90 % in cereals, basically with 2 products, 2,4-D and Illoxan.
   - 5 % other pesticides.

B. Pesticide supply and production

	1990		1991		1992		1993		1994	
	Q	V	Q	V	Q	V	Q	V	Q	V
Insecticides	850	2810	600	2310	550	1945	650	2610	700	3035
Fungicides	650	1670	750	1940	650	1770	750	2210	700	2275
Herbicides	400	2635	400	2775	450	2740	550	3915	500	4045
Others	90	525	110	645	80	575	95	705	100	760
Total	1990	7640	1860	7670	1730	7030	2045	9440	2000	10115

Q in litres or tonnes; V in USD

Number of pesticides registered : 800
Number of active ingredients registered : 210

1. Pesticide usage amounts to 2,000 tons and 10 millions USD. Other estimates are 2,500 tons and 13 millions USD, more in line with FAO statistics of 14 millions USD net import (average on year 1991, 1992 and 1993), which makes around 0.5 kg or lit pesticide per ha cultivated.

2. Twelve companies are approved to distribute the pesticides with STEC (Agrivo ; 15 % market share), SEPCM (Rhone Poulenc, Agrishell, Dupont ; 20-25 % market share), STIPCE, Agriprotec, ICI and Bayer, being the major ones. They are not grouped into a specific federation.

   STEC is the only company formulating pesticides at an industrial scale, in Tunisia. It seems however that few distributors are involved in some marginal repackaging activity and (possibly) in formulation.

3. Half a dozen companies are involved in the production of aerosols. Chimap, one of the largest one, produces 2 millions bottles per year. The plant is neat and well organised, although some improvement might be brought as far as workers protection is concerned.

4. There is a stock of around 500 tons of expired γ HCH used for the anti-locust programme. Other expired stocks do not seem a major problem.

5. STEC (Société Tunisienne des Engrais Chimiques) is a state-owned company located in Meghrine, a semi-industrial zone of Tunis, and active in the production and commercialisation of fertilisers and pesticides. The pesticide activity (2 millions USD ; 15 % market share) is much marginal compared to the fertiliser activity.

   The company operates 2 formulation lines :

   - a line for powder pesticides (DP and WP) : copper oxychloride, maneb, ziram and deltamethrine (K-Othrine)

     - capacity : 2 to 5 tons batch

     - very low capacity utilisation (10 %) due to the dimensioning of the equipment according to the parathion market that has since be banned and to the phasing out of DP and WP type of formulations.

   - a 15 years old line for EC formulations (Illoxan, Decis, dichlorvos, dimethoate, permethrine), running at 80 % of its capacity (600,000 lit).

   STEC is exporting some 10 to 15 % (?) of its pesticide. Although the equipment is depreciated, the formulation is considered as non profitable since every formulation component has to be imported (active ingredients, adjuvents, solvent,...). STEC formulates commodity products as well as pesticide under licence. The line is also used for repackaging.

   Production equipment is old and not well maintained. Standards for risk protection is low: leaks and dust everywhere, protective clothing missing, lack of leaks containment, questionable sewage system,... giving room for major improvements. STEC is running a quality control laboratory used also for soil analysis.

C. Key actors involved in the pesticide sector organisation

1. Ministry of Agriculture

- *Direction Générale de la Production Agricole, Sous-Direction de la Défense des Cultures :*

- Main responsibilities :

- set the policies in terms of plant protection
- registration of pesticides
- legislation concerning the commerce of pesticides
- monitoring of pests and plant diseases
- control of the application of the legislation

To fill in its responsibility, the Direction is backed-up by the Laboratoire de Contrôle et d'Analyse des Pesticides, taking care of all the laboratory work.

The new and comprehensive legislation launched in 1992 superseding the legislation of 1961, regulating the import of pesticide, the registration procedures and the access to the profession, is found one of the Division's major achievement It is based on the FAO code of conduct and helped to better organise the sector and control the market although some smuggling still exists from Libya. The actual implementation of the registration of distributors raises some economic concern.

The Division is prepared to share its experience on legislation and harmonisation to the benefit of the Network. It is presently assisting the Ministry of Health to set the legislation concerning the pesticides for public hygiene which is still missing.

• Priority concern :

A lot of efforts is being devoted to reduce the use of pesticides while maintaining the overall efficacy of chemical control of pests. Several ways are under study, i.e.

- the study of new, more efficient pesticides and the reduction of the doses per ha,
- the improvement of application techniques,
- the promotion of the γ rays sterilisation of male insects by in citrus crops,
- the use of food or sexual attractants combined with insecticides,
- the promotion of biological pesticides.

It is recognised however that all these efforts are going in too many directions without clearly defined strategies and a sensible thread. A specialisation of research development is being looked at in participating to the Network so as to avoid sterile duplication of research work.

• *Laboratoire de Contrôle et d'Analyse des Pesticides*

The laboratory has 3 main tasks : the registration of pesticides, the control of pesticide imports and commerce in respect of the law, and the analysis of residues. It takes an active part in pesticides registration and makes, at a fee, all the analysis work related to pesticide formulation and residue analysis for the Ministry of Agriculture, the Customs and private exporters. It is not fully autonomous.

The laboratory is well equipped although improvements and modifications should be brought to the laboratory to actually work according to required standards.

2. Ministry of Health

• *Direction Hygiène du Milieu et Protection de l'Environnement*

As far as pesticides are concerned, the Direction has the responsibility :

- to register the household pesticides and the pesticides used in public hygiene
- to control their effectiveness and conformity,
- to control the health of workers exposed to pesticides handling,
- to monitor human health problems related to pesticide use.

To perform its task, the Direction has the back-up of the :

- Institut National de Nutrition for pesticides residues analysis,
- Centre Anti-Poison,
- Laboratoire Central du Ministère de L'Economie,
- Laboratoire de Contrôle et d'Analyse des Pesticides

The Direction is presently studying a legislation for the registration of non-agricultural pesticides to issue shortly. One of its concern is also the detoxification of empty containers.

3. Ministry of Environment

The Ministry of Environment has been created recently. The pesticide issue is being handled by 2 Directions : the Direction de l'Environnement Rural et Agricole, and the Direction de l'Environnement Industriel.

To set its presence, the Ministry created an interesting *Centre d'Ecotechnologie Tunisie*. The basic objectives of this Centre are :

- to develop a data base on environment technologies available for the Afro-Arabo-Mediterranean region,
- to train technicians and experts in environment protection,
- to perform applied research in collaboration with universities, research institutes and the industry, to promote engineering and technologies applied to environment protection.

The Ministry is willing to give to the Centre an international spread and sees in the Network an opportunity to achieve this goal. It wishes to actively participate to the setting of the Network and to play a key role in its realisation. The centre is located in Tunis and will be commissioned and equipped shortly. It has

- 1 large conference room with simultaneous translation,
- 2 large rooms for trainings and seminars,
- 4 laboratories for applied research,
- a library.

4. Ministry of Industry

- *Direction des Industries Chimiques, Textiles et Diverses*

The Ministry pointed out the existence of a tender for the commissioning in 1996 of a *Centre Technique de l'Industrie Chimique*, financed through an obligatory contribution of the industry. The centre will have R & D laboratories for mineral and organic chemistry and physico-chemical testing. It is claimed that pesticide formulation will be one of the topics studied. Eight similar centres are or will be created (textile, leather, wood, packaging, food industry,...).

One of the Network's topics of special interest to the Ministry, is data collection, dissemination of information and harmonisation of legislation.

D. Participation to the Afro-Arab Network

1. The Network received much attention and unequivocal support. This enthusiasm is marked in the competition perceived between the ministries to take the leadership and become the national coordinator. It has been mentioned however, that whatever motivations the different government bodies may have, the final decision regarding national coordination will be taken by the Ministry of Foreign Affairs.

2. Comments on the Afro-Arab Network were generally positive They concern :

   - the size of the Network to function properly and the creation of sub-committees,
   - the durability of the Network which depends heavily on what the countries can actually share (without competition) and what the countries can learn and benefit,
   - the motivation, availability and dynamism of all participating countries with special reference to the coordinators, either national or technical,
   - the financial means allocated to the Network that should primarily be dedicated to training and fellowship instead of fruitless meetings.

   The presence of the RENPAP is required for the first meeting in La Réunion to learn from their experience and difficulties.

3. The Tunisian pesticide sector seems to function correctly in a sensible legal framework. That experience can be brought validly to the harmonisation of pesticide legislation and registration. In other topics, Tunisia could learn or be a leader depending on the Network's activities and programmes.

   The *Centre d'Ecotechnologie Tunisie* has interesting premises that might be made available to the Network. It might become a technical focus for certain activities.

EGYPT

Population :	58 to 60 millions
Active population in agriculture :	36 %
Proportion of women in agriculture	40 %
GDP per capita :	800 USD
Contribution of agriculture to GDP :	17 %

A. Agriculture profile

in '000 ha

• Field crops		4,400
of which cereals	2,400	
pulses	150	
industrial crops (cotton 370)	580	
clover	1,100	
• Vegetable crops		400
• Tree crops		400
of which citrus		150
• Cultivated area		5,200

Surface under irrigation	3,250,000 ha
Surface under greenhouses	n.a.

1. Egyptian agriculture was dominated by cotton, the country's largest agricultural export, when it was a heavily subsidised commodity. Cotton production has now slowly declined with the withdrawal of all subsidies, while the production of wheat, maize, beans, fruits and vegetables has increased.

   The cultivated land is 3.3 millions ha almost completely irrigated, allowing a 180 % cropping intensity —taking out the surface dedicated to perennial crops—, increasing the apparent cropped surface to 5.2 millions ha. The major crops are cotton, rice and maize in summer, and wheat, clover and beans in winter.

2. With 1 ha average land per farmer, agriculture production is intensive and the use of fertilisers (300 kg/ha) and agrochemicals relatively high.

3. Pesticides are mostly used on cotton and vegetable crops. In 1989 however, the government launched an IPM project for the reduction of insecticide used on cotton (45 % of pesticides usage was for cotton), by replacing the aerial blind treatments with spot treatment on identified infested areas and the application of the other techniques like the use of attractants. This change, combined with the withdrawal of subsidies, reduced drastically country's use of insecticide from 18,000 tons in 1989, to 4,500 tons in 1994.

   If the programme proved to be a success, it gave rise to new problems related to the manual application of pesticides with knapsack sprayers :

   - lack of training and proper instruction
   - lack of protective equipment
   - detoxification of empty containers
   - health problem of applicators (mainly children) mostly unprotected anduntrained (women are not involved in pesticides application)
   - the rising "on the spot" formulation of pesticide from active ingredient, done by extension services without adequate precautions

   Another IPM programme supported by GTZ is implemented in the region of Ismailia (fruits and vegetables) with the objectives to reduce yield losses caused by pest through better pest monitoring, training, education and promotion of biological methods where feasible.

4. Pesticide usage is hardly known. It estimated to have dropped from 27,000 tons around 1990[2] (45 % for cotton) to some 17,000 tons in 1994.

   Following table gives a very rough estimate in tons of pesticide usage pattern built from various information and sources.

	1990	**1994**
insecticide	12,000	5,000
insecticide	12,000	5,000
fungicide*	13,500	10,000
herbicide	1,000	600
others (rodonticide)	500	400
insecticide	12,000	5,000
Total	27,000	17,000*

of which 80 % is sulphur

B. Pesticide supply and production

1. Market is supplied from imported products (± 75 %) and locally produced pesticides (± 25 %). Export of pesticides is growing due to existing spare capacities created, among others, by the success of the IMP programme in cotton.

2. Imports

	1989	1990	1991	1992	1993	1994	
Insecticides	9,500	7,350	4,950	3,850	3,650	2,750	
Fungicides	4,750	3,450	2,850	1,900	1,950	2,150	
Herbicides	1,580	970	600	300	200	600	
Total (Q in l. or t.)		15,830	11,770	8,400	6,050	5,750	5,500
Net value in mio USD	162	52	45	58	61		

Q in litres or tonnes

Import of formulated pesticides and active ingredients is estimated to reach 100 mio USD/year.

Number of pesticides registered : n.a.
Number of active ingredients : 150

3. Egyptian local production of pesticides includes :

- 1 production plant for active ingredient : Dyestuffs & Chemicals Co
- 2 formulation plants[3]:
  - Kafer El Zayat Pesticides & Chemicals Co
  - El Nasr Industry of Chemical Intermediates
- 1 private repackaging plant —Franchem— operating in the free zone in Abou Rawash for Ciba, Bayer, etc...

4. *Dyestuffs & Chemicals Co, Kafer El Dawar*

Commissioned in 1987 with the support of UNIDO, the plant was originally planned to produced 400 to 500 t/y of dimethoate and malathion. Production of malathion was abandoned due to market constraints and also for quality and quantity problems.

The company plans to build the same unit in terms of capacity and technology to diversify the production of active ingredient —probably organophosphorous compounds, e.g. metachlorvos— and/or export to neighbouring markets. All production of dimethoate is currently sold to Dafer El Zayat, the sister company.

The production unit operates below standard and in a very disorderly and untidy environment that does not urge on the application of adequate safety and risk reduction procedures. The plant has a water treatment unit for effluent detoxification.

5. *Kafer El Zayat Pesticides chemicals Co (K-Z), Kafer El Zayat*

The pesticide formulation plant, commissioned in 1957, produces WP and EC formulations of about 40 different pesticides like malathion, dimethoate (the 2 major ones : 2,000 t/y), copper oxychloride, dicofol, pyrethroids, mancozeb, atrazine, TMTD, thiobencarb, fenitrothion, carbaryl, carbofuran and glyphosate.

All dimethoate needs are supplied by Dyestuffs & Chemicals Co. The production of DDT was stopped in the early '70. The plant runs at not more than 25 % capacity and needs major investments to bring it to international standard. K-Z also produces :

- powdered sulphur in a newer 20,000 tons production unit (1980). It currently runs at 40 % capacity.
- 500 t/y household insecticide aerosols (3 mio bottles). The unit meets international standards.

Turnover reaches 30 mio USD/year of which 7-8 % are exported. The plant generally operates at low standard. Untidiness prevails whith leaks and many empty drums and gas bottles laying down everywhere. Since the commissioning of the plant in 1957, the town has grown around the plant adding to the operational and environmental risks. Industrial effluents are directly discharged to the Nile creating important pollution hazards.

6. *El Nasr Industry of Chemical Intermediates (NCIC), Abou Rawash*

NCIC is one of the companies run by the army cender the National Service Projects Organisation. They produce industrial gases, base chemicals (chlorine, caustic soda,...), specialised fertilisers, pesticides and aerosols. NCIC achieves a turnover of 9 mio USD with pesticides and aerosols, and exports 50-60 % of its production to Saudi Arabia and Yemen.

Current product lines are :

- EC formulation plant running at 35 % capacity (± 5,000 tons) and producing pyrethroïds, dimethoate, malathion, etc... from active ingredients imported from Middle East and Far East.
- WP formulation plant running at less than 10 % capacity and producing 150 t/y baits and zinc phosphide rodenticide (product line has not been visited).
- 2 lines for aerosols running at full capacity (25 mio bottles) producing household insecticides and cosmetic products.

The plant is located in a very wide industrial zone, and generally well organised and tidy. Although operated in a very military way (foremen are officers), some faults concerning workers exposure, and protection, have been noticed.

NCIC has excellent conference room facilities and is prepared to host conferences and workshops that the Afro-Arab network would require as part of their activities.

7. The *Egyptian Agricultural Pesticide Manufacturers Association* is grouping formulators and distributors of pesticides. Meetings are claimed to be scarce and the association is not yet member of the GIFAP association from whom they get so far no support.

8. The stock of expired pesticides is currently unknown. A study is being conducted to size the problem and determine the best method for detoxification.

C. Key actors involved in the pesticide sector organisation

1. Ministry of Agriculture & Land Reclamation

The Ministry of Agriculture is the main authority organizing pesticide registration based on and regulated by the Agricultural Law No. 53, that was issued in 1966, as well as the Ministerial Decree No. 215 issued in 1985.

The Pesticide Committee

An interministerial Pesticides Committee, under the umbrella of the MOA, has been formed and is solely responsible for pesticide registration and licensing of imports. It includes representatives from the Ministry of Agriculture, Ministry of Health, the Egyptian Environmental Affairs Agencies and Universities.

Pesticide Registration

The pesticide registration system in Egypt is a quite sophisticated and time intensive procedure. Complete dossiers have to be submitted according to a check list. If a part of the information is missing, application will not be processed. According to the information submitted, the compound is carefully scrutinized. Upon successfully passing that stage, the compound gets a preliminary registration for experimental use. All products must be tested for at least 3 years, whereas

1st year -- laboratory testing
2nd year - laboratory and field testing
3rd year --field testing

If the product passes all tests, it is finally registered and recommended for use in the country. Importers are entitled to import the registered products, but amounts are limited by the Committee based on average consumption during the past 5 years.

The official policy of the country is to reduce the amount of pesticides and to promote the principles of IPM. Presently around 150 active ingredients are being used in Egypt.

IPM Programmes

The Ministry of Agriculture is presently implementing a 10-12 years Integrated Pest Management Programme in fruits and vegetables with the German Technical Aid Programme. A previous IPM programme in cotton was very successful.

Plant Protection Research Institute

- conducting biological and environmental research
- developing infestation predictions
- identifying and recommending suitable types and qualities of pesticides
- adapting Integrated Pest Management procedures
- preparing technical publications for farmers and agricultural specialists to support identification of infestations and implementation of control methods
- carrying out the efficacy testing required for pesticide registration

In addition to technical and administrative staff, the research departments employed 532 research and assistant research staff and 181 specialists in 1994. The total number of staff was 1220 institute personnel.

Efficacy test for all pesticides to be registered are conducted in the Experimental Research Stations that belong to the Agricultural Research Center. The director of the institution is also a member of the Pesticide Committee.

Formulation Control Laboratory

The Central Pesticide Laboratory in the Ministry of Agriculture is responsible for pesticide formulation control. The laboratory exists since 1970 and has 16 staff chemists (MSc, PhD) operating 4 GLCs and 3 HPLCs.

Laboratory of Residues Analysis of Pesticides and Heavy Metals in Food

The laboratory was established in cooperation with the Finnish International Development Agency in 1995, presently having two main activities: extension activities and analysis of pesticides and heavy metals in food. Certification of export shipments has started on a voluntary basis. The laboratory is using most advanced analytical techniques and able to handle up to 5000 samples per year.

A national monitoring programme for food contamination has beens started by the laboratory ti detect problems due to violation or misuse of pesticides and in order to take corrective measures.

A National Information Center on pesticide residues will be established in the near future. The center will collect, store, manage and disseminate all kinds of data related to pesticides.

2. Ministry of Health

Within the Ministry of Health two departments are concerned with pesticides:

- Department of Chemical Safety
- Center of Environmental Monitoring and Occupational Health Studies

The Ministry of Health has the responsibility for the control of household pesticides and also for pesticide residues in food. The actual control of household pesticides is done in the National Organization for Drug Control and Research (NODCAR), which has laboratories equipped with GLCs and HPLCs. Registration of household pesticides in done in the Central Agency for Pharmaceutical Affairs.

Department of Chemical Safety

This newly established department is presently working on an inventory of chemicals used in Egypt and aims at developing a clear strategy on the risk reduction in that field. The import of chemicals is estimated at 4 million tons per year. Custums invoices are being send to the department for identification and inventarization of the chemicals.

Center of Environmental Monitoring and Occupational Health Studies

The Center, which houses several laboratories on two floors, was established in cooperation with WHO and has a total of 75 staff, out of which 4 chemists and 1 technician are dealing with pesticide residues. The center has a special a network with 9 oustations for measuring the pollution of the Nile and another network with 55 outstations for air pollution.

3. Ministry of Environment

In the past responsibilities for environmental protection in Egypt were widely dispersed between a large number of ministries and bodies. The only central focal point was the Egyptian Environmental Affairs Agency (EEAA).

Egyptian Environmental Affairs Agency

With the new environmental law (Law No 4 of the year 1994) the agency was given clear responsibilities and a Board was formed by a decree of the Prime Minister with high level representatives from the following six ministries

- agriculture
- public works and water ressources
- transport and communication
- industry

- interior
- health

as well as other distinguished experts or organizations.

EEAA is also dealing with of pesticides, considered to be one of the 'Black Spots' in the country. High concentrations of pesticides were found for instance in the Nile and it is expected that concentrations are even higher in agricultural drains, being a risk to drinking water supply or in parts of the food chain (e.g. fish).

EEAA has the mandate to set up a National Hazardous Waste Management programme and is presently preparing a feasibility study in the field of agro-chemicals addressing the information needs and management needs.

As far as pesticides are concerned, a gap in the law was discovered, making it possible that products get release from custums without passing through quality control. They are working on filling this gap in the legislation.

4. Ministry of Industry

- no contacts -

According to the pertinent rules and regulations the Ministry of Industry is responsible of issuing licenses to the pesticide formulators and factories.

5. Other institutions or organizations

University of Cairo

The Faculty of Medicine maintains an Environmental & Occupational Medicine Department. They have been dealing with many different aspects of pesticide use in the country and doing a wide range of research. In 1989 the first international conference on 'Pesticide Intoxication in the Third World Country' was held in Cairo.

Their Toxicological Research Center started also in 1989 as a big complex with

135 researchers (most trained in USA)
57 laboratories (amongts them food and pesticide labs)
120 beds for intensive care

On occupational health and safety issues a survey was carried out from 1992 - 1994 on 10,000 workers, 4000 of them showing some kind of medical trouble, primarily those of aluminium companies.

The main problems with the 120,000 people working with pesticide application in Egypt are:

- illiteracy
- bilharziosis
- de-toxification problems of liver and kidneys
- 20 % carry hepatitis B/C virus

University of Alexandria

The Faculty of Agriculture of the University of Alexandria has an ecotoxicological laboratory where also pesticide formulation development is done. Impressive work has been done on micro-encapsulated formulations, on granules on natural matrix as well as on slow release formulations of Carbofuran. The laboratory is interested to cooperate with chemical industry on further Research & Development.

Egyptian Society of Pesticide Hazards (ESPH)

The ESPH (headed by Prof. Dr. M. Amr of the Cairo University, Faculty of Medicine) has been organizing many awareness campaigns, mainly using media (since 1989). They were also trying to widen political awareness, for instance through several sessions in the Parlament.

Egyptian Association for Agrochemical Producers and Affiliates (EAAPA)

This association has been established only in 1993 based on Law 32 of 1964. With the increasing role of the private sector, its main objective is to put relevant parties together for discussions on all related issues, such as regulatory affairs, handling and use as well as disposal of pesticides.

D. Participation in the Afro-Arab Network

1. The issue of the Afro-Arab Network receive good attention in Egypt with many parties competing to coordinate such network activities.

2. The Ministry of Agriculture's new pesticide residue laboratory offered to become a focal point for the region and offered its facilities available, being representable and in good condition.

3. EEAA, which will be creating an Information Center, probably funded by the Swiss, thinks that there should be a wider range for the network and possibly a hook-up to other networks available. Within the region, EEAA is already the focal point for one of the projects under the Peace Programme together with Jordan, Palestine and Israel.

4. FAO welcomed the Afro-Arab Network and pointed to their present and past activities in the region:

   - propagation of Code of Conduct
   - training courses on safe & efficient use of pesticides
   - two regional TCP for approval

   Whilst FAO is presently not involved in any of the 'Peace Talk Projects' it has 2 other projects for approval

   * strengthening of pesticide control
   * harmonization of registration requirements

   Cooperation with the Afro-Arab Network is seen positively and will be supported.

5. WHO with its Eastern Mediterranean Regional Office in Alexandria (which was not visited due to time constraints and the responsible person being on duty travel) still plays an important role as it coordinates related activities in the area and established a regional Centre for Environmental Health Activities (CEHA) in Amman, Jordan in 1985. (For details see also under country section of Jordan).

6. UNDP outlined the existing problems and difficulties of the country and welcomed the network as excellent means to access important important information which should be used by decision makers to correct and improve the situation. One of the problems will be to get the many different institutions and organizations dealing with pesticides to cooperate and coordinate their efforts. UNDP is offering support and assistance to the network

7. NCIC, the Government owned company, has expressed their strong desire to take an active role within the network and offered its modern facilities which include a quality control laboeratory, a training center and a big auditorium with full audio-visual aids, to host a regional meeting. NCIC is ready to sponsor a representative for the Mauitius meeting in 1996.

8. The regional office for North Africa and the Arab Region of the SANDOZ AGRO Technical Office is likewise very interested in the network and would also be ready to sponsor a participant to the Mauritius Meeting in 1996, possibly from or through the Egyptian Agricultural Pesticide Manufacturers Association (EAAPA). They suggested also to invite the GIFAP regional working group on Africa and the Middle East as well as INRA in Montpellier which has some activities on harmonization of pesticide registration requirements in West-Africa.

SYRIA

Population :	14 millions
Active population in agriculture :	26 %
Proportion of women in agriculture	32 %
GDP per capita :	1,100 USD
Contribution of agriculture to GDP :	31 %

A. Agriculture profile

in '000 ha

• Field crops		4,070
of which cereals		3,450
pulses		230
industrial crops (cotton 190)		320
pastoral crops		70
• Vegetable crops		160
• Tree crops		620
of which olives		400
grapes		70
pistachio		60
• Other cultivated area (fallow)		650
• Cultivated area		5550

Surface under irrigation	1.100,000 ha
Surface under greenhouses	n.a.

1. Wheat and barley together account for nearly 2/3 of the cultivated area. Cotton is the main cash crop, and is produced with excellent yields (cotton shows world-wide best yield after Australia). Other major industrial crops are sugar beet and tobacco.

If the irrigated area has grown rapidly to reach 20 % of the cultivated area, the cropping intensity remains low. Irrigation however brought significant yield increases for all major irrigated winter and summer crops.

2. Agriculture level is well rated with highly motivated farmers extended by excellent trained staff. The government is generally showing much attention to agriculture results and development.

3. IPM programme ran in the coastal area on citrus, cotton, apple and olives, was successful and resulted in a drastic reduction of pesticides used, from 4,500 tons in 1985 to 1,700 tons in 1994 (governmental sector). The withdrawal of price subsidies in 1991 also contributed heavily to this change.

4. Pesticide usage pattern :

- 30 % insecticides used mainly in tree and vegetable crops
- 10 % acaricides used in vegetables, fruits and grapes
- 5 % fungicides used in vegetables, fruits and grapes
- 50 % herbicides for weed control in field crops
- 5 % rodenticides and seed dressing.

B. Pesticide supply and production

1. Pesticide supply was 100 % in hands of the government. It is now slowly liberalised and nowadays the private sector shares 40 % of pesticide supplies. The total pesticides supplies is estimated to account for ± 1,300 tons without the winter oils and powdered sulphur.

Government supplies:

	Volume in tons	Value in mio USD
1987	2,485	12.6
1988	2,822	14.5
1989	1,800	17.6
1990	1,600	9.9
1991	1,800	7.9
1992	2,800	9.9
1993	n.a	13.6
1994	n.a	10.7
1995	n.a	17.1

Number of pesticides registered : 140
Number of active ingredients registered : 70

The break-down of pesticides supplies in 1992 (last figures) is :

- liquid insecticides + acaricides	200 tons
- WP fungicides + acaricides	140 tons
- DP pesticides	85 tons
- herbicides	400 tons
- granules (insecticides + nematicides)	35 tons
Total	**860 tons**
- winter oil	1,500 tons
- sulphur	500 tons
Total government supplies	**2,860 tons**
Private sector supplies	440 tons
Grand total	**3,300 tons**

2. There is presently no formulation plant in Syria, although the *General Establishment for Chemical Industry*, a department of the Ministry of Industry, is studying the commissioning of a formulation plant for producing :

- 2,600 tons EC formulations
- 1,250 tons water dispersible powders
- 1,600 tons winter and summer oils.

Offers from Indian, Italian and French firms have been made. However, considering the old technology based formulations, the low level of capacity utilisation (around 20 %) for a capital intensive project, the spare capacities existing in all neighbouring countries due to the reduction of pesticide use, and the difficult profitability generally encountered for formulation plants, it is recommended to postpone the realisation of the project and to reshape it according to a thorough feasibility study taking into account the new market parameters[4]

3. Current stock of expired pesticides accounts for 265 tons WP (methoxychlor and chlorpyriphos dusts) and 40 tons EC organophosphourus compound. Their detoxification is currently investigated.

C. Key actors involved in the pesticide sector organisation

1. Ministry of Agriculture & Agrarian Reform

The organization of the ministry is devided into

- a central part with different departments
- provincial agricultural directorates with divisions
- olive bureau
- citrus bureau
- cotton bureau
- research directorate

The Department of Agriculture and the Agricultural Research Center have special relevance to the pesticide sector, also the Animal Health Directorate as far as veterinary products are concerned.

Department of Agriculture

- pesticide registration and control

The presently existing pesticide legislation dates from 1952. Products need to be registered in 2 developed countries or in the country of origin. The official policy of the country is to reduce the amount of pesticides. The ministry has on-going tests for new environmentally safer pesticides and for pheromones, it is also testing modern formulation types such as EW formulations. Presently 140 commercial products with about 70 active ingredients are being used in Syria, most products being from Europe, America and Japan. A stock of app. 300 tons of pesticides to be destroyed are reported; the MOA is looking for respective know-how and assistance.

- agricultural extension

The agricultural extension is centrally guided but implemented through the regional offices of the MOA. Distribution and use of pesticides is controled by the provincial offices. On the village level there are appr. 700 extension units.

Agro-Scientific Research Center (Douma Center)

- pesticide formulation control laboratory, equipped with GLC and HPLC instrumentation; app. 500 -600 samples per year, mainly as import control from boarder posts

- pesticide residue laboratory to be added in future in cooperation with IFAD (International Fund for Agricultural Development)

2. Ministry of Health

Within the Ministry of Health's Department of Primary Health Care two departments are concerned with pesticides:

- Department of Environmental Health
- Department of Malaria and Parasitic Diseases

The responsibility for household pesticides is shared between the Ministry of Health and the Ministry of Local Administrations. Since about three years the Ministry of Health has a central laboratory. MOH is also responsible for checking the pesticide residues in houses after spraying campaigns.

Resposibility for residues in food is with the Ministry of Supply, which is reported to have a big laboratory in cooperation with JAICA.

Department of Environmental Health

* involved in all activities related to pesticides
* environmental monitoring
* ecotoxicological questions

Department of Malaria and Parasitic Diseases

* involved in pesticide use and application
* control of malaria, mosquitoes and flies, lechmaniasis, snails

The following problems were reported by the Ministry of Health:

- no control on importation
- need legislation for better control
- no control on private sector
- no environmental law yet
- need to build capacities
- need for assistance in research

3. Ministry of Environment

The Ministry of Environment is a young and small ministry existing since 1991 and having around 40 staff members. They have been working on an Environmental Law which is presently submitted for approval. In addition to that they have defined limits for contaminants.

The MOE has a National Committee on Chemical Safety and is now trying to make a national register for all chemicals entering Syria. In cooperation with the MOA a list of restricted pesticides is being prepared.

The MOE is also coordinator for the PIC procedure and cooperates / coordinates with FAO and WHO.

4. Ministry of Industry

The Ministry of Industry presently seems to have little role in the control of pesticides. Through GECI, the General Establishment for Chemical Industries, there is a direct involvement, however, in pesticide industry in as far as GECI has plans of commissioning of a pesticide formulation plant.

D. Participation in the Afro-Arab Network

1. The issue of networks is relatively new to Syria and needed more explanation. Generally there is a high interest in obtaining technical and commercial information and perticipation in the Afro-Arab Network seems to motivate many of the parties dealing with pesticides.

2. The Ministry of Agriculture is looking forward to this network and offered the facilities available in the Douma Center which has a new auditorium with full audio-visual facilities, ACU and space to accomodate at least 200 people. The deputy minister also pointed out their success in biological control and the total reduction of pesticide use.

   MOA expects to have more pesticides to be destroyed in future and is looking for assistance or consultancies in that field, possibly coming through the Network.

3. FAO welcomed the Afro-Arab Network and mentioned that another network in the Control of Virus and Virus-like Diseases of Fruit Crops (based in Tunis) is executed by FAO. The FAO office is planning to have a connection to INTERNET in the near future.

4. The DEBBANE Group, one of the big pesticide dealers in the region, has also several outlets in Syria. They are quite experienced and active in the field and publish an Agricultural Magazine for the Middle East and the Arab World called AGROTICA and distributed free of charge in Syria. The Group is interested in the network and willing to participate.

LEBANON

Population:	2.9 million
Active population in agriculture:	40 %
Proportion of women in agriculture:	no data
GDP per capita:	3,172 USD
Contribution of agriculture to GDP:	10 %

A. Agriculture profile

areas in '000 ha (World bank Report, figures 1988-89)

- Field crops

cereals	102
tobacco	N/A

- Vegetable crops 23

- Tree crops

citrus	12
apples	5
olives	35
grapes	25

- Other cultivated area

- Total cultivated area 207

total area 10,452 sqkm or 1,045,200 ha

arable land 207,060 ha (1994 figures)
of which irrigated 60,047 ha

greenhouses 0,67 ha

Note: Due to the long lasting civil war in Lebanon most data or facilities for data collection and evaluation have been destroyed; thus a principal difficulty has been the lack of reliable and systemic data. Some data found were quite contradictory between several sources.

1. As a result of the widespread damage inflicted by the war on Lebanese agriculture the cultivated area seems to have fallen to little over 200,000 ha out of a total of 360,000 ha cultivable land.

2. Areawise the cereals account for a large portion of cropland use whilst in terms of production tobacco and fruits represent the largest portion.

3. Fruit exports represent in average 30 % of the total value of Lebanese exports. The Gulf absorbs appr. 90 % of Lebanese fruit exports.

4. The fruit and vegetable production are composed of:

wheat	11 %
potatoes	13 %
vegetables	9 %
garlic, onions	14 %
citrus fruits	14 %
apples	19 %
vines	6 %
bananas	5 %
various fruits	9 %

5. The main exports of fruits in 1993 were: [5]

apples	32,924 tons
citrus fruits	66,863 tons
various other	64,669 tons
TOTAL:	164,456 tons

6. No IPM programme is currently under implementation Some experiments had been carried out a year ago in Saida region in the south as well as in Tripolis area in the north.

7. Pesticides seem to be used extensively, partly also as an adverse consequence of intro-ducing guaranteed prices, e.g. for wheat and beet, in order to motivate farmers to move away from the illegal crops produced during the war period, notably cannabis and opium poppies.

8. The use of pesticides in Lebanon raised some serious issues for human health and the environment. [6]

9. Pesticide usage pattern is estimated to be approximately as follows:

50 %	insecticides / acaricides
30 %	fungicides
15 %	herbicides
5 %	others

(official statistics n/a)

B. Pesticide supply and production

number of products registered:	N/A
number of active ingredients registered:	N/A
local production of A.I.:	none
local formulation appr.:	5-10 %
total imports of pesticides in tons:	N/A
total value of pesticides in USD:	10-15 mio $

1. The pesticide market is roughly estimated at 10 to 15 Mio $ with no information on quantities imported or used.

2. The pesticide market is an open market with products from Europe, USA, Japan as well as from India, Taiwan, China, Korea and other countries. The far eastern products are reported to be up to 40 % cheaper.

3. There is no known production of active ingredient, but some local formulators or refillers/repackers (ADONIS, INSECTA).

4. One of the oldest and probably biggest dealer in the field of pesticides is DEBBANE FRERES GROUP which started with contract spraying in 1937 and now has 125 employees including 40 agronomists involved in agricultural extension work.

5. Most traders are member of the Association of Pesticide Importers & Traders (ASSPEST)

6. In recent years several cases of fake or forged products were discovered.

7. Stocks of outdated products have been mentioned (e.g. some 2 tons of fenitrothion as well as some organochlorines) but more concern was expressed about barrels of partly unknown toxic chemicals which were brought to Lebanon a few years ago from Italy.

C. Key actors involved in the pesticide sector organization

1. Ministry of Agriculture

IRAL - Institute de récherches agronomiques du Liban, has 8 substations, 3 of them in the Bekaa valley. Its station in Beirut, the FANAR laboratories, are considered to have and important tasks related to the pesticide sector.

- main tasks:

  - control of seeds and plants
  - control of veterinary sector
  - food quality control
  - future registration of pesticides
  - pesticide residue analysis

- priority concerns:

  - revision and implementation of pesticide legislation
  - establishment of a pesticide formulation control laboratory

- major topics discussed:

  - a new pesticide legislation
  - a pesticide registration scheme
  - the pesticide residue situation

In Lebanon private companies have been very strong and actually controlling the market. The MOA has now formed a Pesticide Committee to control pesticides. Precondition to accept a pesticide in Lebanon according to the new regulations will be that a product is registered in 3 of the following 6 countries: USA, Japan, France, Belgium, Italy and Germany.

For pesticide residues there is no national norm yet, but FAO/WHO norms or recommendations are generally followed. IRAL is closely cooperating with FAO on issues of pesticides management. Two trained analysts are working on pesticide residue monitoring.

Presently IRAL is looking for support to establish a formulation control laboratory which should be accommodated within the FANAR facilities.

2. Ministry of Health

- no contacts -

3. Ministry of Environment

Chemicals and Pesticides (technologies and industrial pollutants) Section

- main tasks:

  - control and pass customs documents for chemical imports
  - editing positive and negative lists for toxic chemicals
  - designing an environmental code for Lebanon
  - controlling pollutants of all industries

- priority concerns:

  - inventarizing all polluting industries
  - creating data on chemical imports
  - problems with Italian waste of 1987

- major topics discussed:

  - new environmental legislation
  - pesticide problems in the country
  - Sustainable Development Network

Sustainable Development Networking Programme (SDNP)

Lebanon continues to suffer severe environmental deterioration, and lacks the policies and regulations to control this situation. As a result, today's development and reconstruction efforts take place without effective environmental management. Therefore the MOE, together with UNDP, started a programme to integrate environmental concerns and values in philosophical, policy and legal terms. The SDNP project will facilitate increased access to information related to sustainable development available locally as well as to tap into the global knowledge base.

4. Ministry of Industry

The Ministry of Industry presently seems to have little role in the control of pesticides as local pesticide industry is not significant. LIBNOR is the country's standard institute for norms and specifications in all industries.

D. Participation in the Afro-Arab Network

1. Generally there is a high motivation to participate in the Afro-Arab Network, especially since information and data are very scarce and communication as well as systematic data collection were badly damaged as a result of the war.

2. Whilst several institutions (IRAL, MOE) were interested to have a lead in the national coordination, the Council for Development and Reconstruction (CDR) would like to see one national coordinator in charge of all networks existing throughout the country. CDR was also referring to the Sustainable Development Network Programme of UNDP which is presently taking off.

3. FAO welcomed the idea of the Afro-Arab Network and pointed out, that the Lebanese administration is still week and faces problems controlling pesticides. FAO assured its support and cooperation referring also to its activities in that field such as five seminars on pesticides last year in different regions of Lebanon or a TCP with IRAL on pesticide management with one consultant analyzing the pesticide legislation this year.

4. WHO presently is not active with its two regional programmes, one for food contaminants and one for pesticide residues (based in Alexandria), but future cooperation will be welcomed and supported.

5. UNDP, through its Capacity 21 programmes with UNEP and METAP as cooperating agencies would certainly be an interesting contact point for the Afro-Arab Network. A feasibility study of a Sustainable Development Network had just been completed highlighting also the technical requirements and implementation set-up for the situation in Lebanon, where an Internet connected host site will be created.

6. METAP, the Mediterranean Technical Assistance Program, was launched in 1990 by the EIB and the World Bank in partnership with the European Commission and the UNDP. METAP was given the mission to mobilize grant funding to provide Mediterranean countries with technical assistance to identify environmental projects, strengthen environmental management capacity, establish environmentally sound policies, and mobilize resources to finance environmental investment in the context of four priority themes: integrated water resources management, solid and hazardous waste management, coastal zone management and the reduction and control of marine pollution. METAP could therefore be of interest to co-finance the Afro-Arab Network.

7. The DEBBANE Group or ASSPEST may send a representative of their own to the Mauritius conference in 1996.

JORDAN

Population:	4.1 million
Active population in agriculture:	6 %
Proportion of women in agriculture:	no data
GDP per capita:	1,187 USD
Contribution of agriculture to GDP:	8.0 % (1994)

A. Agriculture profile

areas in '000 ha (FAO figures for 1994)

• Field crops			
cereals		112	
wheat	50		
barley	61		
maize	1		
tobacco		3	
• Vegetable crops		40	(84 % are irrigated)
tomatoes	11		
eggplants	3		
peppers	1		
• Tree crops		90	
citrus			
olives			
grapes	5		
bananas			
• Other cultivated area			
• Total cultivated area		405	

81 % are rainfed
19 % are irrigated

total cultivable land 528,300 ha
total area 8,920,600 ha or 89,206 sqkm

1. Only 6 % of the land area of Jordan is cultivable. Jordan's agriculture has been shaped by the acute shortage of water and stretches through three different topographical zones with 91 % of its land being arid:

Area	elevation	rainfall	agro-climatic regions
The Jordan Valley	400 m bsl	100 - 350	marginal, semi-arid, semi-humid
The High Lands	900 m avg.	up to 600	marginal, semi-arid, semi-humid
The Badia		50 - 200	desert, semi-desert, marginal

The country's agricultural land is further characterized by preponderance of small size farming units. Average land parcels were around 24 dunum in 1990.

The Jordan Valley with appr. 100,000 ha of land is characterized by intensive agriculture under irrigation in free land and under plastic.

2. Area wise the cereals account for a large portion of cropland use whilst in terms of production tomatoes and citrus fruits represent the largest portion.

3. Wheat, barley, lentils and chickpeas are grown exclusively in the rainfed uplands and are heavily dependent on the weather. In addition to that grains are imported, especially for use as fodder.

4. Tomatoes and cucumbers, which are grown in abundance under plastic in the Jordan Valley are sold in the lucrative markets of the Gulf.. Other produce of the Valley includes aubergines, cabagges, onions, melons, citrus and bananas.

5. A total of 81 % of the cultivable land is rainfed and 19 % are irrigated. Most of the vegetable areas (84 %) are irrigated.

6. The production figures for main crops in 1993 were:

wheat	57.1 tons
barley	31.8 tons
tobacco	3.4 tons
tomatoes	331.5 tons
cucumbers	46.0 tons
other vegetables	61.2 tons
olives	31.8 tons
grapes	35.2 tons
citrus fruits	106.8 tons
melons	64.3 tons
bananas	30.3 tons

7. Most of the exports of fruits and vegetables go to the Gulf states, although exports to Europe get much higher revenue. The absence of effective quality control is seen as a barrier to breaking into the winter market in Europe.

8. Pesticides have been used extensively in the past; the main use of pesticides is on vegetable crops with lesser amount being used on fruit crops. Heavy use is made of pesticides on vegetable crops grown under plastic, particularly on cucumbers and tomatoes.

9. Pesticide usage pattern was estimated in 1988 to be approximately as follows: [7]

50 % insecticides / acaricides
30 % fungicides
15 % fumigants and seed dressings
5 % herbicides
5 % others

Recent figures of 1994 indicate a shift as folows:

21 % insecticides
30 % fungicides
32 % fumigants and seed dressings
17 % others

10. The use of pesticides in Jordan in the past caused a serious discussions on issues for human health and the environment. A farmer survey carried out by the Jordanian-German Pesticide Quality Control Project in the Jordan Valley as well as in the Highlands documented the prevailing problems.

Most of the farmers interviewed cultivated tomatoes, eggplants, squash, and potatoes (in suitable areas) in open fields, and cucumbers, tomatoes, peppers and green beans under plastic or shade houses. The most dominant pest from above survey was the 'white fly', on account of it being a vector of Tomato Yellow Dwarf Virus. Other important pests are aphids and mites on tomatoes, eggplant, potato, pepper and beans. Curcubits are also affected by downy and powdery mildews.

11. An IPM programme has started in cooperation with GTZ in 1994 with its first activity directed to the problem of the white fly.

B. Pesticide supply and production

number of products registered: 334 (1995)
number of registered active ingredients: 180 (1995)

local production of A.I.: none (1995)
local formulation appr.: 7 % (1991)
number of local formulators : 14 (1995)

total pesticide imports in tons: appr. 1100
value of pesticides imports: 8,7 mio USD (1993)

total pesticide exports: 7,0 mio USD

1. The market for pesticides in Jordan is quite small, but as most of the land in Jordan is not suitable for the production of crops, use per producing hectare is quite high.

   Pesticide market is roughly estimated at 8 to 14 Mio $ with the following amounts imported:

   1987 1638 tons — average of the 80's: 1300 tons/year
   1988 1279 tons
   1989 1311 tons

   1994 1084 tons

   Nearly 1.6 million cans of aerosols were imported and sold in 1991, with just over half being imported and the balance filled locally. Meanwhile this ratio should have increased as additional formulators in that field started in recent years.

2. The pesticide market is an open market with products from Europe, USA, Japan as well as from some Middle East and Far Eastern countries. In 1991 there were 220 dealers licensed to sell pesticides and about 30 importers who were licensed to import pesticides.

3. There is no production of active ingredient, but the number of local formulators or refillers and repackers has risen from 4 companies in 1991 to 14 companies in 1995. One of the larger companies stated that 97 % of their production is for export.

4. Local pesticide formulation plants are concentrated in the Amman and Irbid area, two companies are located further out in the desert or eastern plain. All pesticide formulation plants must be licensed according to the regulations issued by the Prime Ministry in 1989. For this purpose a Committee was formed (with Ministry of Trade & Industry having the leading role) which consists of the MOA, MOH, MOTI, MOL, RSS, Institute of Standards and the Public Security.

5. Usually formulators produce for one or more of the following sectors with almost all raw materials being imported:

   - agricultural sector
   - veterinary sector
   - public health sector
   - household sector

6. Most importers or traders are member of the 'Agricultural Materials Merchants Association (AMMA)' which was founded in 1982. Presently 79 companies are registered, out of which 28 companies are working in import of pesticides.

7. One of the importers (Nabat) is, apart from the normal agro-chemicals, quite active with biological control agents and is now introducing the first commercialized Neem product. He is also taking part in some IPM test programmes.

8. In recent years several cases of fake or forged products were discovered by the Quality Control routines of the MOA. Products usually were confiscated and taken out of the market.

9. Stocks of outdated products have been mentioned but quantities and locations were not readily available.

10. Following companies (the latter three in Irbid's Al-Hassan Industrial Estate) were visited:

Yamama Agr. Products Industrial Co.Ltd. (YAPICO)

The formulation plant has just been constructed within an area of 50,000 sqm considering UNIDO's recommendations of factory planning. Equipment is presently being installed and the plant is expected to be operational within a few months. It avails of 3 production lines, which are:

line	area	capacity
insecticide plant	640 sqm	6,400 tons / shift / year
herbicide plant	580 sqm	2,100 tons / shift / year
powder plant	360 sqm	2,000 tons / shift / year

Apart from the production lines the plant has separate stores for raw material and finished products, storage facilities for chemical solvents and toxic waste ponds and will employ around 40 staff. The plant avails also of a quality control laboratory and a R&D area where a small pilot plant is intended.

YAPICO can produce over 40 different pesticide products, including insecticides, herbicides, fungicides, acaricides and public health products.

The management inquired whether assistance could be granted by UNIDO for commissioning and training of staff. Also they are interested in modern and safer formulation types and technology transfer. Their aim is to produce high quality products according to international standards and therefore have committed themselves to the Total Quality Management.

Households & Toiletries Manufacturing Co. (MS Group)

Mounir Sukhtian Group started this small factory a few years back and produces some household pesticides apart from hair spray and other toiletries They have

- one facility to produce vape mats
- one aerosol line for household pesticides
- one aerosol line for hairs spray, deodorants, air fresheners and furniture polish

Their production is given as 1 Mio cans per year with 0.5 Mio cans of insecticides and 0.5 Mio cans of toiletries. In a small quality control laboratory within the factory they do only checks on filling weight and gas ratio whereas they have the A.I. checks are performed outside by RSS (The Royal Scientific Society)

MEDMAC for Manufacturing Agricultural Chemicals and Veterinary Products

This company was established in 1994 aiming at exports to the Middle East, North Africa and some Asian countries. Apart from agro-pesticides they produce also veterinary products and drugs. They are presently limited to EC formulation with 2 mixers estimated to be 1 and 3-4 tons. A small quality control lab exists as well with attempts for some R&D work on water based formulations and WP's.

The Arab Agricultural Pesticides Manufacturing Co. (MOBEDCO)

The company has a wider spectrum of formulation types within their product range and seem to be the first or only producer of water based formulations in the country. Their technical facilities are said to include:

- one EC line
- one ULV line
- one micro emulsion line
- one WP line

and they plan to have in future also DP's and GR's lines. Their production capacity was given as

- 30 tons per shift for the liquid line
- 10 tons per shift for the powder line

The plant's Quality Control Laboratory is equipped with one GLC and one HPLC. R&D activities are reported and some pilot scale equipment for WP and DU were available.

Their product range includes insecticides, acaricides, fungicides and herbicides.

C. Key actors involved in the pesticide sector organization

1. Ministry of Agriculture

- main tasks:

  - registration of pesticides
  - quality control of pesticides
  - residue monitoring of pesticides
  - agricultural extension & awareness

- priority concerns:

  - revision and implementation of pesticide legislation
  - introduction of IPM concepts

- major topics discussed:

  - pesticide legislation
  - residue analysis and formulation control
  - policies and strategies related to the IPM concepts

The pesticide legislation is still in the process of being changed; revised regulations were elaborated and proposed in 1992 but not adapted yet. Pesticide Registration is in the hands of the Pesticide Committee where all major parties, including pesticide industry, are represented. Pesticide quality control and residue monitoring is performed in a special center (see below). Awareness towards the harmful effects of pesticides has increased over the past years and chances to have IPM concepts successfully implemented are getting better. For the introduction of IPM a project started in 1994 with GTZ.

Center for Pesticide Residue & Formulation Control

Starting with a residue laboratory in 1983 and followed by a formulation control laboratory in 1988, the GTZ supported Center was renovated in 1993. It is well equipped and applying up-to-date instrumentation and analytical methods and presently runs at a budget of around 70,000 JD per year, employing 6 chemists, 3 agricultural engineers and one biologist.

The formulation control laboratory has 3 GC's and 5 HPLC's and analyzed 318 samples in 1994. Details on the results were not readily available.

Its residue laboratory has 6 GC's and 2 HPLC's and analyzed in 1994 a total of 3456 samples. 1175 samples originated from the local market and 4.3 % of those exceeded the MRL's.

2. Ministry of Health

Environmental Health Department

- main tasks:

  - earth monitoring
  - air and space monitoring
  - water and sea monitoring
  - designing an environmental code for Lebanon

- priority concerns:

  - establishment of a Chemical Information Center
  - inventarizing all polluting industries
  - chemical inventory incl. pesticides
  - health and safety guidelines
  - waste disposal

- major topics discussed:

  - new environmental legislation
  - pesticide problems in the country
  - pesticide monitoring programmes
  - occupational health & safety
  - local pesticide formulation

A new environmental law was passed in October 1995 establishing the general organization for environmental protection; the main body responsible will the Environment Department of the Ministry of Municipality and Rural Affairs.

The MOH is represented in the Pesticide Committee for registration of pesticides and also in a Committee in the Ministry of Trade & Industry which is responsible for the licensing of pesticide factories. Recently, as part of their 'Pesticide Monitoring Programme', a group of experts visited all pesticide factories in the country and prepared a status report. Their major concerns were

- which kind of waste is produced
- amount of waste produced
- treatment available

Recommendations were made to update requirements for establishment of such factories.

In a project with WHO (starting 1996) the MOH wants to build up a chemical inventory for Jordan incl. pesticides. They are already using some WHO and UNEP databases. Also the MOH is opting to become the designated national authority for the PIC concept for chemicals other than pesticides.

3. Ministry of Municipality & Rural Affairs

Department of Environment

- main tasks:
  - implementation of the new environmental law
  - coordination of related activities
  - regional cooperation
- priority concerns:
  - inventarizing all polluting industries
  - factories and their waste management procedures
  - problems with hazardous chemical waste
- major topics discussed:
  - new environmental legislation of October 95
  - 2,5 Mio $ project with UNIDO on environment issues
  - pesticide problems in the country
  - waste management in the country

A new environmental law was passed in October 1995 establishing the general organization designating the Department of Environment (DOE) as the main body responsible to implement or coordinate related activities.

Recently a 2,5 Mio $ project was signed between UNIDO and the Government of Jordan as a multilateral fund project to contribute also to agenda 21. The areas or topics to be dealt with are the replacement of halon and methyl bromide, commercial refrigeration, recycling of domestic and industrial waste and water management.

One of the concerns of the Department of Environment are the amounts of chemical hazardous waste that it figured out to be more than 1000 tons. As an intermediate solution the DOE has determined a hazardous waste collection site to collect all waste and store it, until methods of decontamination (such as incineration) are available in Jordan.

4. Ministry of Trade & Industry

The Ministry of Trade and Industry's main concern, as far as pesticides are concerned, is the implementation of the regulations issued by the Prime Ministry in January 1989 regarding the licensing of pesticide manufacturing or formulation facilities. An inter-ministerial committee reviews all applications and inspects the facilities for full compliance to pertinent regulations prior to issuing licenses.

5. Other institutions or organizations

Institution for Standards and Metrology (ISM)

Formerly called the Directorate of Standards and Metrology of the Ministry of Industry and Trade this institution became independent as of June 1st, 1995. The institute is the official contact point for Codex Alimentarius and carries also some responsibility within the country for setting national MRL's.

Agricultural Materials Merchants Association (AMMA)

Most importers or traders are member of the 'Agricultural Materials Merchants Association (AMMA)' which was founded in 1982. Presently 79 companies are registered, out of which 28 companies are working in import of pesticides. Their main activities are

- Extension work

  mobile team of agr. engineers
  lectures, films, posters, leaflets
  organization of field days
  work in experimental stations

- Cooperation with Agr. Eng. Association

  training of new graduates
  workshops and scientific days

- MOA cooperation

  Pesticide Registration Board
  Fertilizer Registration Board
  Seeds Registration Board

The AMMA's targets include amongst others to enlighten it's members with their responsibilities towards the public, the farmers and the agricultural sector in the country.

Royal Scientific Society (RSS)

The RSS is a non-profit institution established in 1970 and enjoying financial and administrative independence. It conducts scientific and technological research associated with the overall development process in Jordan particularly in the field of industrial development. RSS aims at promoting scientific and technological awareness, providing distinguished technical consultation and specialized training

services, and contributing to regional development through scientific and technological cooperation.

As far as pesticides are concerned, the RSS activities and contributions includes or included:

- conducting applied research projects related to various pesticides used in Jordan and determining their residues in crops (RSS took also part in the National Programme on Pesticides)

- testing and analyzing pesticides (imported and locally manufactured) to ensure their compatibility with Jordanian standards and specifications

- providing technical consultancies related to formulation and analysis of pesticides

- active member in most technical committees related to pesticides

Nowadays official testing for imported and locally formulated pesticide products as well as for pesticide residues is performed by the MOA's Center in Baqaa whereas RSS still continues this work on contractual basis for the industrial and private sector.

Two centers are equipped to deal with pesticides:

- the Industrial Chemistry Centre (pesticide formulation analysis)
- the Environmental Centre (pesticide residue analysis)

RSS is aiming at obtaining international accreditation of their laboratories and requested related assistance from the World Bank and GTZ.

D. Participation in the Afro-Arab Network

1. Motivation to participate in the Afro-Arab Network was high with most parties visited. Only some of the pesticide companies were initially hesitant as they might have feared loosing some of their secrets.

2. The MOA suggested that their Center for Pesticide Analysis in Baqaa may become the technical focal point for pesticide formulation control, pesticide residue monitoring and regulatory affairs.

3. The Department of Environment (DOE), being focal point already for Jordan for the CEDARE Network (Center for Environment and Development for Arab Region and Europe) that started three years ago, is looking forward to join this network as well.

4. The JES (Jordan Environment Society) is a NGO founded in 1988 with more than 60 member organizations and 2,200 individuals, joined together to promote the protection of the environment and the sustainable use of its resources. In several committees they have more than 100 experts on environmental protection, pollution prevention, environmental policy, law and administration, ecology, forestry, water and environmental awareness education. The JES has also a strong interest to join the network.

5. The RSS is very interested in the activities of the Network and in joining it as a member or in the role as a national coordinator.

6. The NIC, the National Information Center, was established in 1993 to coordinate, manage and organize information as a resource for national development. Both, NIC and RSS are under the Higher Council for Science and Technology, chaired by Crown Prince Hassan. The Center's responsibilities include the establishment of a National Information System, organization and coordination, standardization and others. The NIC is presently in the process of linking public institutions which includes all ministries, public universities and NGO's of public interest.

   NIC is the top level Jordanian administrator of INTERNET and has an own node since 26th of October 1995. NIC plans to tackle the environmental sector through the Agenda 21 Programme with UNDP and could then also link to the Afro-Arab Network.

7. WHO welcomed the idea of the Afro-Arab Network and pointed out, that they had been already been active in the region over the past of years through their Regional Center for Environmental Health Activities (CEHA) in Amman which was established in 1985 by WHO's Regional Office for the Eastern Mediterranean (EMRO).

Their activities were mainly related to

- environmental monitoring
- occupational health & safety
- waste management

Also the CEHA NET which is a regional network on environmental health information could be of interest for the Afro-Arab Network. In particular the network provides information in support of the WHO/CEHA programmes in environmental health, namely:

- community water supply and sanitation (CWS)
- environmental health in rural and urban development housing (RUD)
- health risk assessment of potentially toxic chemicals (PCS)
- control of environmental health hazards (CEH)
- food safety (FOS)
- environmental health in refugee camps and emergencies (RCE)

CEHANET aims to promote regional cooperation in information exchange in the field of environmental health and helps to build and strengthen the national information infrastructure of each country in the region.

8. UNDP Amman is presently preparing a feasibility study for the Sustainable Network Programme (SDNP) in cooperation with the National Information Center. Results of the study are expected to be available after 2 months. Coordination and cooperation with the Afro-Arab Network is seen positively and is welcomed.

9. The local pesticide dealers association may also be interested to join and send a representative of their own to the Mauritius conference in 1996

SAUDI ARABIA

Population:	17.4 million
Active population in agriculture:	9.9 %
Proportion of women in agriculture:	no data
GDP per capita:	6300 (1990)
Contribution of agriculture to GDP:	8 % (1990)

A. Agriculture profile

areas in '000 ha (8)

• Field crops	
cereals	1,089
fodders	272
• Vegetable crops	133
• Tree crops	
citrus	10
dates	86
grapes	9
other fruits	12
• Other cultivated area	3
• Total cultivated area	1,614

total area 2,150,000 sqkm or 215,000,000 ha

cultivable land 3,785,000 ha
cultivated land 1,614,000 ha

1. Three crops account for almost 70 % of cropland use: wheat, barley and sorghum, whereas total fodders uses about 17 % and the total vegetable crops only 8 % of the cultivated land.

2. Production amounts of various agricultural goods are as follows:

cereals	4.9 mio tons
fooders	2.8 mio tons
vegetables	2.3 mio tons
fruits	1.0 mio tons

3. In addition to local production around 5,2 mio tons of cereals have been imported in 1993.

4. Major fruit crops are:

dates	85790 ha	568000 tons
citrus	10161 ha	59000 tons
grapes	9265 ha	124000 tons
other fruits	12526 ha	237000 tons

5. IPM programmes were started 3 years ago (in cooperation with FAO) and are implemented in palm dates production (under Government responsibility) and in wheat and citrus production under private management. In the private sector small farmers are difficult to convince for IPM whilst big farmers have become experts in the field.

6. Pesticides still seem to be used extensively. Around 350 different active ingredients are found in appr. 2200 commercial products registered. About 75 active ingredients are banned for used in the country, 9 are restricted in their use.

7. The fertilizer consumption in Saudi Arabia increased from 20.9 kg per hectare of arable land in 1980 to 143,9 kg per hectare in 1993.

8. Application technologies generally used are

   - aircraft in open areas (big farms, wheat, and also for locust)
   - through irrigation systems (big farms, fertilzers and pesticides)
   - motor sprayers

   For small farmers chemicals are applied free of charge by the ministry.

9. Data on pesticide usage pattern were not available.

B. Pesticide supply and production

number of products registered: 2200
number of active ingredients registered: 350

no local production of A.I.
local formulation appr. 5 %
total imports of pesticides: no data
total value of pesticides: 100 Mio USD (1993)

1. The pesticide market is roughly estimated at 80 to 100 Mio $ with no information on quantities imported or used. In the public health sector the use of pesticides amounts to appr. 30 tons in 2 years.

2. The pesticide market is an open market with products mainly from Europe and USA.

3. There is no production of active ingredient in the country, but according to the MOA there are 4 local formulators or refillers/repackers such as

   - SCIDCO Saudi Chemical Industry Company in Riyadh or
   - JOHNSON (with Basameh Group) in Jeddah

4. Visits to pesticide formulators seemed to be difficult to organize. One company in Riyadh apologized due to maintenance work, the formulator in Jeddah has only a line for household pesticides and cooperates with Johnson & Johnson. .

5. According to the Council of Saudi Chambers of Commerce and Industry there is no association of pesticide formulators, importers or traders. All chambers are equally organized and have an agricultural committee; all farmers must be member of a chamber. There were no records of pesticide imports readily available with the Council.

C. Key actors involved in the pesticide sector organization

1. Ministry of Agriculture

Agricultural Research Department

- main tasks:

  - control of seeds and plants
  - control of pesticide products
  - registration of pesticides
  - pesticide residue analysis (only fresh food)

- priority concerns:

  - improving control of pesticides
  - promote IPM programmes

- major topics discussed:

  - pesticide registration scheme
  - local pesticide formulation
  - quality control of pesticides
  - agricultural extension

Pesticide registration exists since 1983 within the Plant Protection Division of the Agricultural Research Department and is governed by an agricultural law of 1976 (10.1.1396 in the Arabic calendar). According to that law each pesticide needs to be registered. Registration requirements include that the products are registered and produced in the country of origin and that full technical details (dossiers) are forwarded. The registration procedure takes about 1 year for a new product.

Pesticide quality control is performed in the MOA's quality control laboratory in Riyadh but limited to the determination of active ingredients only. The importance of including also physico-chemical parameters into the testing was explained. The laboratory is part of a research center performing also other analysis related for instance to seeds, soils, water and tissue cultures.

Pesticide residue control for fresh fruits and vegetable is also the responsibility of the Ministry of Agriculture, but practical testing is done through the food control laboratories of the Ministry of Commerce.

2. Ministry of Health

Preventive Health Section

- main tasks:

  - conduct public health and safety campaigns
  - application of pesticides in public sectors
  - ensure occupational health and safety

- priority concerns:

  - general assessment of health hazards
  - medical application within public health
  - proper use of pesticides

- major topics discussed:

  - registration of pesticides (household & public health)
  - local pesticide formulation
  - occupational health & safety
  - public health campaigns
  - pesticide residues
  - local agenda 21

There is no registration for public health pesticides whereas household pesticides are in a way registered through the Saudi Standardization Agency and then go directly to the market. According to the MOH there is not too much use of household pesticides in Saudi Arabia, exact figures, however, were not available.

The Ministry of Health is mainly using 4-5 different products in public health campaigns targeting mainly mosquitoes, sandflies and snails with a total pesticide input of usually 30 tons over 2 years. They have special precautions for workers in public safety campaigns. In routine cholinesterase testings over 3 years no effect was found on workers applying Fenitrothion.

A representative of the MOH (Dr. Al-Zahrani) has been a member of the delegation to Agenda 21 and was also working on the local agenda. Their local programme of action puts emphasis on waste management.

According to the MOH the responsibility for pesticide residues is with the Ministry of Municipality. All outcome of agenda 21 is supposed to be coordinated by MEPA, the Meteorology & Environmental Protection Administration in Jeddah.

3. Ministry of Environment

Meteorology and Environmental Protection Administration (MEPA)

- main tasks:
  - environmental monitoring & coordination of responsibilities
  - analytical duties pertaining to the land, air and water
  - prepare appropriate environmental standards and
  - criteria to regulate urban and industrial activities
  - promotion of public awareness of environmental issues
  - play a catalytic role in different processes

- priority concerns:
  - ensure chemical safety
  - introduce environmental standards
  - make use and coordinate existing facilities

- major topics discussed:
  - environmental legislation
  - pesticide problems in the country
  - environmental awareness projects
  - environmental data networks

In 1981 MEPA's mission was expanded and it consequently became the central environmental agency within the Kingdom. The highest environmental body in the Kingdom is the Ministerial Committee for Environment, of which the President of MEPA serves as the Secretary General of the Committee. It formulates national environmental policies and strategies and also sets the Kingdom's position with respect to the environmental issues on the international and regional levels.

Important administrative, procedural and legislative documents were introduced my MEPA with assistance of an Australian-Saudi cooperation project and include:

* national environmental legislation
* a national conservation strategy
* procedures and requirements covering the preparation and submission of environmental impact statements
* procedures for implementing the environmental protection standards
* a national contingency plan for combating spills of oil and other harmful substances
* a regulation controlling the emission of exhausts from diesel motor vehicles

Inspections at industrial sites are a major part of MEPA's pollution control activities, but they also involve for instance into research of terrestrial ecosystems.

4. Ministry of Industry & Electricity

The Ministry of Industry & Electricity's involvement in the pesticide sector is mainly the licensing of factories and the assignment of industrial spaces in designated areas. Pesticide formulation/repacking was considered a minor issue as about 95 % of all products are being imported.

5. Ministry of Commerce

The Saudi Ministry of Commerce is directly involved in and strict on food control. They have 8 laboratories in the country, mainly along the boarders. Technical Co-operation existed before with Holland, now mainly with the FDA of America. Within the country the Saudi Arabian Standard Organization (SASO) provides most of standards needed. Also for pesticide residues MRL's are fixed whereas some substances are reported to have a zero tolerance. For substances that are not regulated yet, FAO or WHO recommendation are being applied.

Although the testing for fruit and vegetables is the MOA's responsibility, the actual testing is performed by the Q.C. labs of the Ministry of Commerce.

Other tests include the examination of the basic composition (carbohydrates, proteins and fat), additives, radiation, microbiology and control of labeling. In 1994 appr. 305000 samples were analyzed. One of the laboratories concentrating on pesticide residues analysis is the Jeddah lab.

Shipments of food imports may be accepted if they are accompanied by certificates of analysis from laboratories overseas that are accredited with SASO.

D. Participation in the Afro-Arab Network

1. The motivation to participate in the Afro-Arab Network was generally very high and the network was specifically welcomed by several institutions, some of which do have already a good infrastructure.

2 The King Abdulaziz City for Science & Technology (KACST) is an independent scientific organization in the KSA and administratively attached to the Council of Ministers. Its Information Service Department offers excellent technical and infrastructural facilities in the field of information exchange, such as

- production of national S&T data bases
- provision of on-line search services
- operation and maintenance of two data communication networks

These services vary greatly in their scope, impact and visibility and are provided to scientists and researchers in the Kingdom without any regard to their location or affiliation.

One of the networks, the GULFNET, was the first network in the Arabic world and links together a number of computer installations in the Arabian Gulf countries. It was established in May 1985 to facilitate exchange of information between academic and research institutions in the region. GULFNET is also connected to BITNET in the United States and through it to other international networks like NETNORTH (Canada), EARN (Europe), DFN (Germany), and JANET (England). Presently the Information Service Department is carrying out a pilot project for INTERNET connection using 128K lines.

Apart from the huge computer facilities the Information Service includes

- more than 400 periodicals
- interactive training packages
- micro fiche facilities
- 15000 scientific books

KACST will not be opting or nor able to coordinate the Pesticide Network, but they will be more than happy to provide the necessary infrastructure within the country.

3. WHO has been organizing regional workshops on pesticides through their regional office in Amman and are looking forward to cooperate with the Pesticide Network.

4. UNDP considers the Afro-Arab Network an interesting and important programme and indicates its support. A feasibility study of a Sustainable Development Network has not been done yet, but reference was given to the KACST's Information Dept. which is dealing with networks.

5. MEPA, being a focal point for all environmental data, offers its full support for the networks and would be willing to act as national coordinator.

6. SEAP, the Saudi Environmental Project, and a Private Sector collaboration with the Government for the promotion of healthy and clean environment throughout the Kingdom, is welcoming inquiries and/or cooperative relationships with other environmental groups in the Gulf region and is also interested to cooperate with the Pesticides Network. Being financed entirely by the private sector they cooperate closely with MEPA, the Kingdom's Central Environmental Agency.

7. The MOA is looking forward to benefit from the network and to receive new impulses. It considers the interlinking of pesticide related institution on national and on international level as very important and wants to improve the regulation of pesticides in the country with the aim of reducing risks related to pesticide use.

GENERAL COMMENTS AND RECOMMENDATIONS

The number of countries visited presented a wide range of economies and agricultural structures with many of the countries having similar problems. Whilst not every country has a clear 'Centre of Excellence', all of them would benefit from the network and do appreciate UNIDO's efforts.

Comments on the situation in the different areas of concern:

A. The general awareness and understanding towards the risks and hazards associated with the use of agrochemicals has increased. Some countries are aware that misuse of pesticides has caused a lot of damage in the past. Several countries are thinking of possibilities and strategies to reduce such risks.

B. The team found also that in some countries there is a recognition of IPM and in many countries also registration requirements based on the FAO Code of Conduct. The proposed Network will make the necessary linkages with this activities. The Network, however, should put emphasis on bio/botanical pesticides and other low risk pesticides to complement IPM.

C. In most countries women are involved a great deal in agriculture. Though data on their direct involvement in pesticide use and application were not readily available, some reports indicated that there is a high risk for women and children being involved for example in harvesting, often being done shortly after or even on the same day of spraying. Concerns were raised also about small children accompanying their parents and playing around on the farm, sometimes in sprayed fields or with empty pesticide containers.

D. The increased use of fertilizers has raised concern to environmental authorities in several countries. Ground water contamination is also feared by the combined application of fertilizers and pesticides through irrigation systems, but actual data from monitoring are scarce. Apart from ground water contamination high fertilizer use may cause problems with eutrophication of water ways (e.g. Egypt).

E. The problem of disposal of empty pesticide containers was raised in many countries. There is also a major international concern and the proposed network should look into the ways and means of eliminating or reducing the risks associated with the misuse of containers.

F. In several countries seed multiplication programmes or projects existed (e.g. Egypt, Jordan). They usually have facilities for seed treatment which, however, are not available to all farmers or in all areas. Small and medium scale farm holders do not have much access and normally use farm retained seed.

G. Generally concerns about toxic chemicals have increased considerably. Many countries started inventories of all chemicals entering to/or being used in the country. Information starts to exist ranging from simple listings and reports over databases to mappings. Countries expressed their wish for assistance in risk assessment and technologies for waste management.

H. In the field of formulation technology, unfortunately, most local formulators stick to old technology and/or do not get any incentives for introducing modern and less toxic types of formulation. Few countries, however, have replaced some EC formulations by water based formulations of the same active ingredient. In Jordan for instance some formulators started some in Research & Development for water based formulations. On the contrary, in Egypt the pesticide industry complained that replacement of EC formulations by less hazardous water based formulations is not done as is would require complete new registration including all testing which is expensive and time consuming (up to 5 years).

I. Occupational health and safety problems were unfortunately reported or encountered in many countries. Safety of workers in production or formulation facilities is often not up to standard and needs considerable improvement.

K. Though pesticide related legislation exists in many countries, implementation is often different or difficult. Generally a harmonization of pesticide registration requirements (as promoted also by FAO) is desirable, combined with incentives for replacing old types of products and formulations by newer and safer products, often being more effective at lower rates of application (low volume high activity products).

Following are some of the major conclusions and recommendations:

1. The planned network received much attention and unequivocal support. In some countries this enthusiasm is marked by the competition between ministries or organizations to take the leadership and become national coordinator for the network.

2. In some countries questions were raised towards the participation or inclusion of other countries in the region. Egypt and Jordan for instance commented that Israel and other neighboring countries should be included, Tunisia pointed out the importance of extending the services of the network to all African countries, specifically the poorer ones in the region.

3. The network should benefit from the experience made by RENPAP and should also be hooked-up or interconnected with other similar networks or data bases in the world. This could possibly be done through the SDNP programme of UNDP.

4. The technical possibilities and requirements for effective communication and relay or access to information according to newest technical standards should get proper attention and should be highlighted.

5. In the Expert Group Meeting in Mauritius, RENPAP should present and report on their experience with the network. Also other organizations such as FAO, WHO, UNEP, METAP and others should summarize and present their activities related to the field.

6. Also pesticide industry should take an active part in the Mauritius Meeting and present their point of view.

7. Focal topics as proposed in annex B should be briefly outlined and discussed during the Mauritius Meeting.

8. Each country that would like to become a technical focal point for a certain topic should be invited to give a poster presentation of existing facilities in that field. Space available for the poster presentation would have to be coordinated and communicated to the participants.

9. Structure of the Network, activities and financial support as well as cooperation and interaction with other regional or international organizations should be highlighted again as this was of general concern for most countries.

APPENDIX A

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

JOB DESCRIPTION

XP/INT/95/12/11-01

Title: Agrochemicals management Specialist (Team Leader)

Duration: 1.5 m/m (incl. travel) over a period November-December 1995

Time required: November/December 1995

Duty Station:

Vienna 2 days, Rabat (4 days), Tunis (4 days), Cairo/Alexandria (6 days), Damascus (4 days), Amman/Lebanon (6 days), Riyadh (3 days), Vienna (3 days), homebase (7-10 days)

Purpose of the Project: To promote risk reduction in agrochemcials development in the Afro-Arab Region by networking.

Duties:

The expert will be part of a team of four experts divided into two teams one covering the Africa region and the other one covering the Arab region. The team will visit selected countries in the region to discuss with government officials dealing with agrochemicals, visit agrochemical industries, institutions which have facilities to deal with agrochemcials and discuss ways and means of setting up coordinate efforts for risk reduction in pesticide development. He/she along with other members is expected to explain the recent developments in agrochemicals, their proper management and all efforts to create awareness and capability to effectively promote risk reduction in agrochemcials development. As a leader of the team he/she is expected to explain UNIDO's aim to catalyze regional networking, asses the capability of the country for technically contributing to the functioning of the networking. He/she should identify qualified national/ regional counterparts who could participate in the proposed regional networking.

He/she should advise UNIDO the modalities of setting up of a network and should submit a joint report with other experts. The report will be used as a basic document for discussion in a proposed preparatory meeting to be held in Mauritius during June 1996. In addition to the report mentioned above he should assist UNIDO, based on the mission prepare a draft programme document to set up a regional networking for discussion in the preparatory meeting and finalize it after the discussions with member countries. During the meeting he/she should assist UNIDO in the organization of the preparatory meeting, prepare programme, lead discussions and assist in preparing report of the meeting with recommendations. In all this he/she will be assisted by his team, UNIDO and national counterparts.

Qualification:

A chemist or biochemist or biologist with extensive experience in the field of agrochemicals with emphasis on pesticides. Must have a good experience in quality control of pesticides and their formulations, registration procedure for pesticides, FAO specifications, safety aspects related to pesticides, good laboratory practice, contamination of soil and water courses. Involvement in international conferences, publications etc would be useful. Experience in developing countries especially in the Arab region would be an added advantage.

Language: English with some French and/or Arabic

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

JOB DESCRIPTION

XP/INT/95/012/11-02

Title: Specialist in safe pesticide development, marketing and Networking.

Duration: 4 weeks (including travel) over a period Nov - Dec 1995

Time required: November/December 1995

Duty Station: Vienna (briefing 2 days), Tunis (4 days), Cairo/Alexandria (6 days), Damascus (4 days), Vienna (2 days), Homebase (1 week)

Purpose of the Project: To promote risk reduction in agrochemicals development in the Afro-Arab Region by networking.

Duties: The expert will be part of a team of four experts divided into two teams one covering the Africa region and the other one covering the Arab region. The team will visit selected countries in the region to discuss with government officials dealing with agrochemicals, visit agrochemcial industries, institutions which have facilities to deal with agrochemcials and discuss ways and means of setting up coordinate efforts for risk reduction in pesticide development. He/she alone or along with other members is expected to explain the recent developments in agrochemicals, their proper management and all efforts to create awareness and capability to effectively promote risk reduction in agrochemcials development. The team he/she is expected to explain UNIDO's aim to catalyze regional networking, asses the capability of the country for technically contributing to the functioning of the networking. He/she should identify qualified national/ regional counterparts who could participate in the proposed regional networking. He/she should advise UNIDO the modalities of setting up of a network and should submit a joint report with other experts. The report will be used as a basic document for discussion in a proposed preparatory meeting to be held in Mauritius during June 1996.

Qualification: A chemist or marketing specialist with vast experience in pesticide development, safety in production and formulation, knowledge of regional networking in promoting safety. Must have long standing experience in international projects on pesticides in market study, safety aspects, legislative measures. Experience in Arab and/or Africa region would be an advantage.

Language: English and French.

APPENDIX B

Afro-Arab Network
- possible focal points -

INFORMATION COLLECTION & DISSEMINATION

covering pesticide production, import &export, data on accumulation of pesticides, waste data from industries, ware houses etc, toxicity data, pesticide registration requirements

FORMULATION TECHNOLOGY

low risk agrochemicals (pesticides & fertilizers) and modern formulation techniques information on new developments

QUALITY CONTROL & QUALITY ASSURANCE

harmonization and implementation of quality standards and quality control by industries and governments

BIO/BOTANICAL PESTICIDE DEVELOPMENT

development of bio- and botanical pesticides specially making use also of local ressources where possible

IPM CONCEPTS

concepts of integrated pest management making use of chemical, biological and cultural methods to reduce the load of agrochemicals in the environment

SEED DRESSING TECHNOLOGY

further development or adaption of seed dressing technology and post harvest treatment

APPLICATION TECHNOLOGY

further development and/or adaption of application technologies

INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH & SAFETY

further development / adaption of industrial hygiene and occupational health and safety

INDUSTRIAL SAFETY & WASTE MANAGEMENT

adaption of industrial safety standards, development and adaption of waste management concepts

ECOTOXICOLOGY & ENVIRONMENTAL MONITORING

development and implementation of ecotoxicology & environmental monitoring programmes

APPENDIX C

CONTACTS MADE

COUNTRY: MOROCCO

area codes (00-212-)		PHONE	FAX
MINISTRY OF INDUSTRY:			
Mr. Mohammed BENAYADA	Chef de Service de la Protection de l'Environnement	7-76 50 33	7-76 06 75
Mr. Jamal MORCHADI	Service de la Protection de l'Env.	7-76 50 33	7-76 06 75
Mr. Chakour Abderahim	Chef de Service des industries chimiques	7-76 22 97	7-76 35 37
MINISTRY OF AGRICULTURE:			
Mr. Rachid LAKHDAR	Directuer de la Protection des Végetaux, des Contrôles Techniques et de la Repression des Fraudes		
Mr. Ahmed SALAH BENNANI	Chef du Service de la Protection des Végetaux		
Mr. Ahmed ELHARMOUCHI	Chef du Bureau des Pesticides et de l'Homologation	7-715 47	
Mr. Larbi HACHIMI	Directuer, Laboratoire Officiel d'Analyses et de Recherches Chimiques (L.O.R.A.C.)	2-30 20 07	2-30 19 72
Mr. Omar EL GUERMAZ	Ing. Chimiste, Laboratoire Officiel d'Analyses et de Recherches Chimiques (L.O.R.A.C.)	2-30 20 07	2-30 19 72
Mr. EL BENAZZOUZ	Ing. Agr., Laboratoire Officiel d'Analyses et de Recherches Chimiques (L.O.R.A.C.)	2-30 20 07	2-30 19 72
MINISTRY OF HEALTH:			
Mr. Mustapha KADDAF	Chef du Service		
Mrs. DAGHMOUSSI	Chef de Service de la lutte contre les vecteurs de maladies, Division d'hygiène du milieu		
Dr. IDRISSI LARBI	Chef du Département de Toxicol., d'Hydiène Industrielle, Environnement. et de recherches Médico-Légales	-77 21 62	7-77 20 67

MINISTRY OF ENVIRONMENT:

Mr. Mdarhri ALAOUNI	Chef, Division de l'Observation et des Etudes	7-76 20 07	7-76 95 78

REPRESENTATIVES OF INDUSTRY:

Mr. Jochen BRAB	Directeur, Bayer Maghreb S.A.	2-20 47 27	2-29 69 42
Mrs. Hayat Ait YOUSSEF	Ingénieur, Bayer Maghreb S.A.	2-20 47 27	2-29 69 42
Mr. Boubker EL OUILANI	Directeur Division AGRO, CIBA-GEIGY MAROC	2-35 46 14	

FAO:

Mr. Mohamed ROUIGHI	Représentant de la FAO au Maroc	7-76 57 56	7-76 64 68

UNDP/ UNIDO:

Mr. Guy VANMEENEN	UNIDO, Chargé de Programme	7-70 35 55	7-70 15 66

OTHER ORGANIZATIONS:

Dr.-Ing. Otto SCHMIDT	GTZ / MOE, Chef de Mission	7-76 39 33	7-76 23 09
Jürgen TENDLER	GTZ / MOE, Chimiste Laboratoire National	7-76 39 33	7-76 23 09
Dr. Brigitte HEUEL-ROLF	GTZ / MOA, Chef de Mission Projet Contrôle phytosanitaire	7-85 49 59	7-85 49 59

COUNTRY: TUNESIA

area code (00-216-)		PHONE	FAX
MINISTRY OF INDUSTRY:			
Mr. Mongi JLAIEL	Directeur des Industries Légères	1-892 638	285 947
Dr. Ing. Noureddine Ben Mansour	Direction Générale de l'Industrie	1-802 649	
Mr. Youssi Ben Said	Direction Générale de l'Industrie	1-802 649	
MINISTRY OF AGRICULTURE:			
Mrs. Fatma LARBI	Chargée de Mission et de la Coopération Internationale	1-890 863	
Mr. Mohamed LASSOUED	Coopération International Cabinet	1-890 863	
Mr. ZAIDI	Eng. Général, Direction de la Protection des Végétaux		
Mr. Abdelaziz CHEBIL	Ingénieur en Chef, Laboratoire de Controle et d'Analyse des Pesticides	1-681 639	
MINISTRY OF HEALTH:			
Dr. Abdelhamid HANNACHI	Inspecteur Général de la Santé Publique	1-792 877	
MINISTRY OF ENVIRONMENT:			
Mr. Fayez AYED	Chef de Cabinet	1-703 161	1-702 431
Mr. Jaafar FRIAA	Directeur de l'Environnement Industriel	1-706 970	1-702 431
Mr. H'maied KOUKI	Sous-Directeur, Reboisement, Espaces Verts, Eaux et Pesticides	1-704 000	1-702 431

REPRESENTATIVES OF INDUSTRY:

Mr. Taoufik GHARSALLAH	Directeur Général adjoint S.E.P.C.M.	1-295 915	1-295 310
Mr. Mongi DRISS	Directeur, CHIMAP S.A.R.L.	1-786 570	1-785 030
Mr. KAMOUN	Directeur Général Technique S.T.E.C.	1-491 226	1-399 794
Mr. Salah TOUMI	Contrôleur de Gestion S.T.E.C.	1-491 226	1-399 797
Mr. Ben Nacef LARBI	Eng. en Chef Recerche Développement et Laboratoire, S.T.E.C.	1-490 050	1-493 440

FAO:

Mr. Mohamed AJROUD	Chargé de Programme	1-782 686	1-894 824

UNDP/ UNIDO:

Mr. Massimo GARZELLI	UNIDO Country Director	1-785 922	1-781 563

OTHER ORGANIZATIONS:

EGYPT

area codes (002-02- for Cairo)		PHONE	FAX
MINISTRY OF INDUSTRY:			
- no contacts -			
MINISTRY OF AGRICULTURE:			
Dr. Salwa Dogheim	National Director Quality Control of Agr. Prod.	361 1282	361 1106
Mr. Kalevi Siivinen	Project Coordinator	361 1355 Quality Control of Agr. Prod.	361 1216
Dr. Nabil Zaki Soliman	Deputy Director of Central Pesticide Laboratory	335 9415	
	Director of Plant Protection Research Institute	348 6163	335 6175
MINISTRY OF HEALTH:			
Dr. Abdel Azis EL.SHAFEI	Director of Chemical Safety Department	354 9617	
Dr. (Mrs) Seham M. Hossein	Director, Center of Environmental Monitoring and Occupational Health Studies		
MINISTRY OF ENVIRONMENT:			
Dr. Tarek GENENA	Director, Technical Cooperation Office for the Environment Egyptian Environmental Affairs Agency	302 9102	302 9081
Dominique Krayenbuhl TAWFIK	Chemist, Technical Cooperation Office for the Environment, Egyptian Environmental Affairs Agency	302 9102	302 9081
Dr. Mohamed A. El ZARKA	Head of Environmental Quality Sector Egyptian Environmental Affairs Agency	360 1191	361 0764

INSTITUTIONS:

Prof. Dr. Mohamed SOROUR	Research Professor, Dep. of Chem. Eng. and Pilot Plant National Research Center	337 0933	337 0931
Dr. Eng. Shadia Ragheb TEWFIK	Research Professor, Dep. of Chem. Eng. and Pilot Plant National Research Center	337 0933	337 0931
Dr. Mahmoud M. AMR	Professor, Cairo University Faculty of Medicine, Environmental Medicine & Occupational Diseases Dep.	250 1762	247 4287
Dr. Hamdy SOLTAN	University of Alexandria Faculty of Agriculture		

REPRESENTATIVES OF INDUSTRY:

Gen. Dr. Sayed Mostafa Meshaal (Chairman)	NCIC, El Nasr Co. for Intermediate Chemicals	385 5680	383 5678
Dr. Ali Ibrahim Sabri	General Manager, NCIC	383 6679	383 5678
Mr. Said Mohamed Attia	Production Manager Dyestuffs & Chemicals Co Kafr El-Dawar	(04) 920 869	(04) 900 645
Eng. Abdel Salam el Madbouly	Production Director Dyestuffs & Chemicals Co Kafr El-Dawar	(04) 582 444	(040) 325631
	Kafr El-Zayat	(03)490 0004	
Mr. Beat Adler	Regional Manager SANDOZ AGRO	291 3964	291 5414

FAO:

Dr. Mahmoud M. Taher	Regional Plant Protection Officer	349 7184	349 5981

UNDP/ UNIDO:

Ms. Lucia CARTINI	UNIDO Junior Professional Officer	578 4840	578 4847
Eng. Amin El-Sharkawi	UNDP Officer for Environment and Development	578 4040	578 4847
Mr. Constante Muzio	UN Resident Coordinator UNDP Resident Representative	578 4849	578 4847

OTHER ORGANIZATIONS:

Mr. Saad Abdalla	USAID, Consultant Engineer	357 3613	357 2233
Dr. Werner Gassert	GTZ team leader, IPM programme	335 3349	360 3972
Dr. Bernhard Homeyer	CAS/GTZ, Improvement of Seed Production and Supply	573 4516	341 2445

COUNTRY: SYRIA

area code (00-963-2- Damascus)		PHONE	FAX
MINISTRY OF INDUSTRY:			
Dr. Eng. Abdul-Karim Hourani	General Establishment for Chemical Industries (GECI)		
Mrs. Mouzayane Kottrache	Chem. Eng., GECI		
MINISTRY OF AGRICULTURE:			
Eng. Orphan Alloush	Deputy Minister	221 8836	
Eng. M. Rifat al-Lahham	Director, Plant Protection	222 6455	
Mr. Taysir Sheikh Omar	Head of Central Pesticides Laboratory DOUMA Center	532 3037	
Mr. Khalil Abdul Khalim	Head, Plant Protection Research DOUMA Center	532 3037	
Dr. Khalil Asheikh	Plant Protection		
MINISTRY OF HEALTH:			
Dr. Nazmi Fallouh	Vice Minister		
Dr. Misbah Ghali	Head of Env. Department		
Dr. Iman Khalil	Department of Malaria and Parasitic Diseases		
MINISTRY OF ENVIRONMENT:			
Mr. Rashid Najjar	Director, Rehabilitation & Training	442 13 86	
Mr. Imad Hassoun Homsi	Agr. Eng.	442 13 86	
Mr. Fouad El-O'k	Scientific & Environmental Research Center	662 3148	662 2309
REPRESENTATIVES OF INDUSTRY:			
Mr. Elias Salhani 1433	Marketing Manager DEBBANE & CO	(11) 333 9191	(11) 332

FAO:

Mr Dominique Burgeon	APO, Programme Officer	333 9152	333 0429

UNDP/ UNIDO:

Mr. Per Janvid	Resident Representative UN Resident Co-ordinator	333 9532	332 7764
Mr. Abdullah Dardari	National Programme Officer	333 2440	332 7764

OTHER ORGANIZATIONS:

Dr. Dirk Willers	GTZ coordinator PQP / MAAR	221 5143	221 5143

COUNTRY: LEBANON

area code (00-961-1-)		PHONE	FAX
MINISTRY OF INDUSTRY & PETROLEUM:			
Eng. Sami Assy	Chief of technical affairs and industrial services	423 809	
Eng. Rabih L. Saab	Head, Department of Standardization & Quality Control	426 607	
Paul Masri	Food Science	426 607	
Georges N. El-Khoury	Chef du Service des Etudes Economiques & du Develop. Industriel	427 119	427 212
MINISTRY OF AGRICULTURE:			
Dr. Christo Hilan	Director, FANAR Laboratories Agricultural Research Institute	882 123	
Mrs. Salma Kilani Haidar	Head, Agricultural Department Agricultural Research Institute	400 157	
Mrs. Maha Bidawi	Research Assistant FANAR Laboratories	400 123	
Dr. Fawzo Nicolas	Veterinary Surgeon FANAR Laboratories	882 123	
MINISTRY OF HEALTH:			
- no contacts -			
MINISTRY OF ENVIRONMENT:			
Dr. Hanna Bou-Habib	Chemical Expert Chemicals & Pesticides section	521 030	
Dr. Naji Kodeih	Chemical toxicologist Control of Technology section	521 030	
Mrs. Rola Naser Eddine	Analytical chemist Environmental Laboratory	521 030	
OTHER INSTITUTIONS:			
Dr. Ghassan Seblani	Programs Division Council for Development and Reconstruction	647 934	864 494

REPRESENTATIVES OF INDUSTRY:

Mr. Aziz E. Ammar	Marketing Manager DEBBANE FRERES SAL	(09)-201 839	(09) 935 361

WHO:

Dr. Abdelhay Mechbal	Resident Representative	366 760	

FAO:

Amor Ben Romdhane	Resident Representative for Libanon and Cyprus	468 173	601 358
Rene Barthomeuf	Advocat Food legislation expert with FAO	France / 75 81 57 50	

UNDP/ UNIDO:

Mr. Mounir Tabet	UNDP Assistant Representative	822 146	603 460
Mrs. Lamia Mansour	Sustainable Development Advisor	822 145	603 460
Mrs. Randa Nemer	UNDP National Proj. Coordinator Sustainable Development Project (MOE)	603 463	603 460
Mr. Mohamed O. Abdelmoneim	UNIDO Country Director for Lebanon, Syria and Jordan	427 998	424 677
Mr. George Eid	UNIDO liaison officer	427 998	

OTHER INSTITUTIONS:

Dr. Linda Kfoury	Virologist Lebanese University Faculty of Agronomy	819 802	819 804
Dr. Wafa Khoury	Plant pathologist Lebanese University Faculty of Agronomy	819 802	819 804

COUNTRY: JORDAN

area codes:	(00-962-6- for Amman) (00-962-2- for Irbid)	PHONE	FAX
MINISTRY OF TRADE & INDUSTRY:			
Eng. Fawzi Momani	Chief Environment & Safety	401 2777 ext 2060	
MINISTRY OF AGRICULTURE:			
Mr. Mazen Khasawneh	Director of Plant Protection Department	686 151	725 704
Mr. Ahmad Khasawneh	Director of Center for Pesticide Formulation & Residue Analysis	726 201	725 704
Eng. Bassem Sukkar	Supervisor Pesticide Residue Laboratory	726 201	725 704
MINISTRY OF HEALTH:			
Mr. Mazen M. Khalil	Director, Environmental Health Dep.	666 147	666 147
Mr. Yanal F. Abeda	Env. engineer Earth Monitoring Section Environmental Health Dep.	666 147	666 147
Mrs. Fatima Tawalbek	Chemist Lab & Chemical Info Center Environmental Health Dep.	666 147	666 147
MINISTRY OF ENVIRONMENT & RURAL AFFAIRS:			
Eng. Ghazi Faleh Odat	Assistant Director Dep. of Environment	695 626	695 627
Mr. Raid Tbeishat	Ind. eng., network managent Ozone Unit Dep. of Environment	695 626	695 627

Mr. Hussein Shaheen	Specialist Ozone Unit Dep. of Environment	695 626	695 627
Mr. Hussein Badarin	Env. eng.	672 132	695 627

OTHER INSTITUTIONS:

Eng. Hassan Saudi	General Director Institution for Standards And Metrology	695 721	681 099
Mrs. Sawsan Beiruti	Food Processing Eng. Institution for Standards	680 139 ext 520	
Dr. Yousef A. Nusseir	Director General National Information Centre	837 184	837 168
Mr. Fadel Sweedan	Manager, Technical Services National Information Centre	837 184	837 168

REPRESENTATIVES OF INDUSTRY:

Eng. Mahmoud al Tabaishi	Managing Director Nabat Agricultural & Trading Co	815 813	863 813
Mr. Ghaleb A. Zureikat	Chairman Yamama Agri. Products Co. Ltd. YAPICO	847 516	833 585
Mr. Akram Abdullatif	General Manager Yamama Agri. Products Co. Ltd. YAPICO	606 931	606 931
Mr. Samer G. Zureikat	Business Development Yamama Agri. Products Co. Ltd. YAPICO	606 931	606 931
Eng. Ghassan M. Babieh	Technical Manager Yamama Agri. Products Co. Ltd. YAPICO	606 931	
Mr. Samir Abu Tarbush	Technical Manager Households & Toiletries Manufacturing Co. (MS)	(02) 295 290	(02) 295 311

Mr. Riyad Haymoor	Engineer Households & Toiletries Manufacturing Co. (MS)	(02) 295 290	(02) 295 311
Mrs. Muna Jarrar	Chem. eng. Commercial Department ARAB AGR. PESTICIDES MFG. CO. MOBEDCO	(02) 295 195	(06) 685 439
Dr. Rabab Al-Fanik	Veterinarian Research and Development ARAB AGR. PESTICIDES MFG. CO. MOBEDCO	(02) 295 195	(02) 295 225
Eng. Qasem Rashrash	Technical Manager MEDMAC for Manufacturing Agricultural Chemicals & Veterinary Products Ltd.	(02) 295 390	(02) 295 391
WHO:			
Dr. Mohamed Z. Ali Khan	Coordinator Regional Centre for Environmental Health Activities	684 655	686 591
UNDP:			
Mr. Jorgen Lissner	U.N. Resident Coordinator and Resident Representative	668 171	676 582
OTHER ORGANIZATIONS:			
Mr. Suleiman E. Hanbali	Executive Director Jordan Environment Society	669 844	695 857
Mr. Yazan al Mufti	Director Environmental Systems	815 707	823 262
Dr. Said Alloush	Vice President Royal Scientific Society	844 701	844 806
Dr Yaseen M. Khayyat	Environment Research Centre Royal Scientific Society	844 701	844 806
Dr. Saleh Suradi	Director, Ind. Chemistry Centre Royal scientific Society	844 701	844 806

COUNTRY: SAUDI ARABIA

area codes	(00-966-1- for Riyadh) (00-966-2- for Jeddah)	PHONE	FAX
MINISTRY OF INDUSTRY & ELECTRICITY:			
Eng. Solaiman H. Al-Solai	Director General Industrial Cities Department	477 5038	
Mr. Salih A. Abalkhail	International Relations	477 6666	477 3973
MINISTRY OF COMMERCE:			
Dr. Abdel Rahman al Zamil	Deputy Minister of Trade	401 2222	
Dr. Hamad A. Al-Awfy	Director General for Quality Control & Inspection Dept.	401 3265	402 2539
Dr. Abdula'y al Abdula'y		401 2222	402 2539
Dr. Jamil M.A. Nazer	Director General Jeddah Quality Control Lab	647 3188	647 6310
MINISTRY OF AGRICULTURE:			
Mr. Abdul Karim Al Ghamdi	Director General Agricultural Research	401 2777 ext 2060	
Mr. Obaid Allah Moh. Al-Ajmah	Specialist	401 2777	
Mr. Ibrahim Al-Hasoon	Specialist	401 2777 ext 2060	
MINISTRY OF HEALTH:			
Dr. Mohammed Ali Al Zahrnani	Director General Ministry of Health	478 7411	473 1544
Mr. Suleiman M. Al-Seghayer	Ass. Director General for Parasitic Diseases	402 0177	
MINISTRY OF ENVIRONMENT:			
- MEPA - Meteorology & Environmental Protection Administration in JEDDAH			
Dr. Abdulbar A. al-Gain	President of MEPA	(02) 651 8676	651 1424
Dr. Abdullah D. Al-Fawaz	Director Pollution Control	(02) 651 2312 ext 2663	
Mr. Naif S. M. Shalhoub	Env. Information Manager	(02) 651 2312 ext 2910	

REPRESENTATIVES OF INDUSTRY:

Mr. Ali Basameh	Entrepreneur Jeddah Johnson Plant	(02) 660 6668 (02) 637 8402	

FAO:

Dr. Mohamed M. El-Zayat	FAO Senior Plant Pathologist	401 2777	403 3563

WHO:

Mr. Jamal Y. Abu Issa	Administration Officer	462 7620	465 2104

UNDP/ UNIDO:

Mr. Yves de San	Resident Representative	465 3022	465 2087
Mr. Youssef Rashad	Deputy Resident Representative	465 3022	465 2087
Mrs. Khawla Tabaqchali	Programme Officer	465 3157	
Mr. Ali A. Farwana	Liaison and Public Relation Officer	465 3077	

OTHER INSTITUTIONS:

Dr. Abdullah O. Al-Musa	Director General, Information Systems King Abdulaziz City for Science & Technology	488 3069	488 3118
Mr. Usamah M. Al-Kurdi	Assistant Secretary General Council of Saudi Chambers of Commerce & Industry	405 3200	402 4747
Mr. Omar Abdullah	Virologist Plant Protection Department Faculty of Agriculture King Saud University	467 8435	
Mr. Hamdy Hossein	Specialist Toxicology Section Plant Protection Department Faculty of Agriculture King Saud University	467 8435	

ANNOTATIONS

[1] Bayer has an incinerator unit.

[2] Country paper presented at Expert Group Meeting on Safety Guidelines, Brussels, 1992.

[3] According to the country report presented at Expert Group Meeting on Safety Guidelines in Brussels (1992), there are 4 other (small) formulation plants i.e.

- MISR Petroleum Co (governmental) : EC and oil emulsion : 1,100 t/y.
- Co Operative Society of Petroleum (governmental) : oil emulsion : 1,000 t/y
- Ciba Geigy (private) : pilot plant for EC : 100 t/y.
- Two small private companies with facilities for EC formulations

A new formulation plant for liquids and powders —Helbe Co— would have opened recently in Damietta.

[4] A separate note is addressed to UNIDO for its perusal.

[5] INVESTORS GUIDE, Lebanon 1994

[6] World Bank Report 1995

[7] 1988 figures of CEHA Special Studies No.1

[8] 1994 figures of Department of Economic Studies & Statistics

Addendum

West Bank and Gaza Strip

The Mission did not visit West Bank and Gaza Strip. However at the special request of the UNDP office and the information given, it is also included in the Afro-Arab Network.

A. Agricultural Profile:

Population:	
Active Population in Agriculture:	30%
Proportion of Women in Agriculture	50%
GDP per capita	
Contribution of agriculture to GDP	30%

The major crops are vegetables and fruits mainly for export.

Agriculture plays a vital role in the life of Palestinian people. A survey and analysis of the situation in the Palestinian territories with regard to use of pesticides was carried out by UNDP/PAPP in Jerusalem in March- April 1995 revealing widespread problems affecting not only agriculture, but also other sectors such as health, environment and trade

B. Supply and use of Pesticide.

Total consumption of pesticides in 1995 in West bank was around 700 tons at a cost of US $ 15 million. Methyl bromide(implicated in ozone depletion) alone amounted to 40.5 %. In the Gaza Strip around 100 tons of formulated pesticides were used.

Among 123 pesticides used in the West bank around fourteen were either banned or restricted in use internationally. According to the survey the use of pesticides in the region has bean one of the highest and many of them belong to highly toxic and persistent category.

Distribution of use of pesticides.

Field vegetables:	53%
Tree crops	34%
Plastic Houses	07%
Other Crops	06%

Added to agriculture pesticides ar also used in household, public health and veterinary outlets.

There is no legislation in the country regarding sale and use of pesticides. Indiscriminate use of pesticides is causing unacceptable pesticide exposure. There are no quality control by regulatory authorities.

Clear and comprehensive policies concerning pesticide registration, import and local formulation, trade and use, Good Agricultural Practice and Maximum Residue Limits for pesticide as well as for export regulation have to be formulated.

C. Institutions involved in Pesticides:

The Center for Environmental and occupational Health Science (CEOHS) of the Birzeit University and Applied Research Institute of Jerusalem(ARIJ) have been involved in doing a survey of the pesticide use and assess the problems. ARIJ recently released a paper analyzing 'farmer Practices, Knowledge, Attitude and Safety Precautions (1995) '

Agricultural extension services are carried out by governmental, semi-governmental and non.governmental organizations.

Institutions such as Environmental protection and Research Institute (EPRI) conducts workshops to minimize the use of pesticides. CEOHS is doing workshops on safe use of pesticides. Agricultural corporate Union, the American Near East Refugee Aid have all programmes related to improving safety on pesticides.

D. Institutions that could be involved in the Network.

Ministry of Agriculture along with organizations mentioned above could play a role in the proposed network. Emphasis will be on legislation, occupational health and safety and quality control.

KUWAIT

The Mission did not visit Kuwait but its inclusion in the network is important due to its capacity and expertise in the area of ecotoxicology/Environmetal Monitoring. It could play a key role for the Afro-Arab Region. UNIDO is assiting the Kuwait Institute for Scientific Research(KISR) in establishing a state of the art laboratory for ecotoxicity and environmental monitoring of industrial pollutants including the petroleum industry. This institute could play an important role of assisting the network in matters related to Ecotocxicology and Environmetal Monintoring.