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REGIONAL NETWORK ON PESTICIDES FOR ASIA AND THE PACIFIC

DP/RAS/88/031

Technical report: Workshop on Industrial Hygiene and Occupational Health Safety and Their Environmental Concerns
Metro Manila, Philippines, 15-19 April 1991*

Prepared for the Governments of the Member States of the Regional Network (Afghanistan, Bangladesh, China, India, Indonesia, Iran, Myanmar, Malaysia, Pakistan, Philippines, Republic of Korea, Sri Lanka and Thailand) by the United Nations Industrial Development Organization acting as executing agency in association with the Ministry of Agriculture and the Fertilizer and Pesticide Industry of the Rep. of the Philippines for the United Nations Development Programme

Based on the work of Ms. Nelia C. Maramba and Mr. W.R. de Alwis and adopted by the participants of the workshop on 19 April 1991

Backstopping officer: B. Sugavanam, Chemical Industries Branch

United Nations Industrial Development Organization Vienna

* This document has not been edited.

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I. INTRODUCTION

1. The seminar/workshop on Industrial Hygiene, Occupational Health Safety and their Environmental Concerns in Pesticide Production Plants, one of the RENPAP programmes, was held in Manila, Philippines, from 15-19 April 1991.

2. This seminar/workshop was attended by representatives of the member countries from Afghanistan, Bangladesh, Peoples Republic of China, Indonesia, India, Republic of Korea, Malaysia, Myanmar, Pakistan, Thailand, Philippines and Sri Lanka and from United Nations Agency i.e. UNIDO.

3. This seminar/workshop was organized by the Fertilizer and Pesticide Authority of the Department of Agriculture, Republic of the Philippines for RENPAP. The list of participants is attached as Annex of the report.

II. OPENING CEREMONY

4. An invocation was delivered by Mr. Ruben de Leon.

5. The welcome address was delivered by Hon. Senen L. Lacam, Secretary of the Department of Agriculture. He emphasized that this workshop should serve as a regional forum to assess each country's capabilities, and to enable these countries to help each other in improving the industrial capabilities of the region. He wished that this forum would bear fruitful results.

6. Respective sponsoring agencies then gave their messages: Mr. Christian Newman, UNIDO Country Director conveyed the greetings of Mr. Domingo Siason, Jr., UNIDO Director General and the regrets of Mr. Kevin Macorath, UNDF Resident Representative for not being able to attend. He pointed out that the Philippines has greatly contributed to UNIDO, the objective of which is to raise the standards of occupational safety.

7. Representative of UNIDO, Vienna conveyed greetings of the Director General of UNIDO. He commended the Philippines for having a strong pesticide program. RENPAP has 17 member-states in the Asia-Pacific region which represent 1/2 of the world's population. This Philippine workshop is the completion of an initial workshop held in Indonesia last year involving industrial safety, waste management, and effluent control. This present workshop aims to demonstrate the real problems of pesticide development and use. He hopes realistic views would be developed for proper guidelines for the protection of workers and the end users.
8. Dr. S. F. Dhua, RENPAP Regional Coordinator extended his congratulations to Mr. Luis T. Villa-Real, Jr., overall Chairman and his staff for preparing the workshop seminar that addresses the occupational problems relating to agricultural pesticides.

A workshop held in China, 1990 concluded that the industry is responsible for developing and choosing safer chemicals that are environmental friendly. For example, pesticides started with organo-chlorines followed by the development of organo-phosphates and carbamates and recently the synthesized pyrethroids.

Both the scientific and industrial sectors have to address side-by-side the following issues: 1: revamping of old plants; 2: protecting the workers; and 3: preserving the environment.

The first series of RENPAP Workshop is now in the Philippines particularly addressing the issues of health of workers in pesticide production plants.

9. Prof. Elma B. Torres was tasked with the introduction of the speaker, Dr. Alfredo Benzon, Secretary of Department of Health.

10. The inspirational message of Dr. Benzon was a signal and affirmation of the desire and capabilities of the Philippines to deal with three (3) areas:

1) Training in the safe use of pesticides brought down more effectively to the level of workers and farmers;

2) Research and implementation to suit the local situation;

3) Reexamination of government programmes concerning the following:

- issues on lower costs and greater safety and,
- fewer chemicals or the development of other substitutes.

11. Mr. Luis T. Villa-Real, Jr., FPA Executive Director thanked the different guests and sponsors of the Workshop (i.e. Agricultural Pesticide Institute of the Philippines) and declared the conference officially opened.
III. ELECTION OF CHAIRPERSON AND APPOINTMENT OF RAPPORTEUR:

12. Mr. Luis T. Villa-Real, Jr., was elected overall Chairman while Dr. Ranjit de Alwis (Sri Lanka) was appointed General Rapporteur.

13. It was proposed and unanimously approved by the Assembly to have daily chairpersons and rapporteur. They were as follows:

<table>
<thead>
<tr>
<th>Chairperson</th>
<th>Rapporteur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luis T. Villa-Real, Jr.</td>
<td>Ranjit de Alwis</td>
</tr>
<tr>
<td>Nella C. Maramba</td>
<td>Joselito Capas</td>
</tr>
<tr>
<td>Elma B. Torres</td>
<td>Aida V. Ordas</td>
</tr>
<tr>
<td>Carmen P. Castaneda</td>
<td>Norman Slagen</td>
</tr>
<tr>
<td></td>
<td>Marivic Garcia</td>
</tr>
<tr>
<td>Luis T. Villa-Real, Jr.</td>
<td>Ranjit de Alwis</td>
</tr>
</tbody>
</table>

14. Responsibilities of the chairpersons and rapporteurs were as follows:

The Chairperson of the day should be familiar with the proceedings of the day in order to direct timing of events, to highlight important issues, and to keep sessions in order. The rapporteur would be responsible for the minutes of the proceedings of that day.

IV. ADOPTION OF AGENDA

15. The Agenda was presented and adopted unanimously. UNIDO Representative suggested that the recommendations of the Indonesian meeting held last year be taken up here and together with the outputs and recommendations of the Philippine meeting come up with a package for the region.

V. COUNTRY PAPERS

16. The delegates of member countries submitted their country papers. The following are their abstracts:

16.1 Afghanistan

A. Authorities and Agencies Responsible for Industrial Medicine
and Occupational Health and Safety.

Ministry of Health - responsible for public health, policies and guidelines.

Ministry of Agriculture - responsible for control of diseases and pests.

Fertilizer and Pesticide Authority Departments - responsible for regulation of fertilizer and pesticide users.

Afghan Fertilizer and Agricultural Services Company - responsible for importation and distribution of pesticide.

B. Fungicides Used:

1. Insecticides
2. Nematicides
3. Fungicides
4. Rodenticides

2. Pesticides Produced: none

3. Hazard Category: not mentioned

4. There are no formulating plants

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety.

The government believes in the promotion of the health, safety and welfare of the workers and has promulgated laws to set standards for such.

D. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. Inadequate data collection and analysis.
2. Lack of technical expertise.
3. Poor safety and hygienic standards in the workplace.

15. Bangladesh

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

1. Environmental Pollution Department
2. Ministry of Agriculture
   a. Pesticide Technical Advisory Committee
   b. Pesticide Technical Advisory Sub-Committee

3. Ministry of Industry

B. Pesticide Usage/Production/Hazard Category/Formulating Plants

1. Pesticide Used:

   Acaricide - Bromopropylate, Dicofol, Ethion, Sulfur, Propoxur.

   Fungicide - Bordeaux mixture and cuflaneb, Carbendazim + thiram, Copper Quinachloride, Edifenphos, Mancozeb, Tridemorph, Aluminium phosphide, Methyl bromide, Triadimenol, Triadimenol, Pirimiphos-methyl, Iprodiene, etc.

   Herbicide - 2,4-D Glyphosate, Dalapon, Dalapon, Sodium, Paraquat, Propanil, etc.

   Rodenticide - Zinc Phosphide, Cumatetralyl, Bromadiolone

   Wood Preservative - Cude of CCA type-C

   Insecticide - BPMC, Carbaryl, Carbofuran, Carbosulfan, Cartap, Chlordane, Cypermethrin, Chlorpyrifos, Diazinon, Deltamethrin, Dichlorvos, Dicrotophos, Dieldrin, Dimefox, Endosulfan, Fenitrothion, Fenthion, Fenvalerate, Formothion, Heptachlor, Isocarbophos, Isazophos, Malathion, Monocrotophos, Methiocarb, Methomyl, Methomyl methyl, PhenthoATE, Phosalon, Phosphamidon, Pirimicarb, Quinalphos, Trichlorphon, etc.

   Public Health

   Product - Chlorpyrifos, Chlorpyrifos ethyl, d-Allethrin, Pirimiphos-methyl, Esbitorrin, Fermithrin, Tetramethrin, Temephos.

2. Pesticide Produced: none mentioned
3. Hazard Category - (WHO) IB, 2.3 are used
4. Presence of formulating plants


Licensing from the Plant Protection Wing based on the recommendation of the Environmental Pollution Department of the Ministry of Environment and Forest is required for all formulating plants based on a set of standards. Pesticides classified under Category IA are banned from use.

D. Problem involved in Industrial Hygiene and Occupational Health and Safety.

1. Inadequate data collection - medical personnel are not obligated to report poisoning cases; no nationwide census.
2. No technical manufacturing plant.

16.3 China

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

1. Bureau of Health Inspection (BHI) under the Ministry of Public Health (MPH).
   - policy making, legislative body promoting occupational health and safety

Functions:

a) National standards for chemicals and dusts
b) Preventive measures for keeping of standards
c) Medical examination
d) Technical expertise
e) Rules and legislation
f) Monitoring of chemical concentrations in the workplace
g) Biological monitoring of chemicals and their metabolites

2. Institute of Occupational Medicine, Chinese Academy of Preventive Medicine - most important link in the system of BHI.

3. Chinese Environmental Protection Agency

4. Medical universities
5. Anti-epidemic sanitation stations
6. Local Institute of occupational medicine

B. Pesticide Usage/Production/Hazard Category/Formulating Plants

1. Pesticide Used/Produced:
   a. Organophosphates
   b. Organochlorines
   c. Methyl carbamates
   d. Pyrethroids
   e. Fumigants
   f. Insect growth regulators
   g. Biological insecticides
   h. Fungicides
   i. Herbicides
   j. Rodenticides
   k. Nematicides
   l. Plant growth regulator

2. Hazard Category: (WHO) 1A, 1B, 2, 3, 4 are used.

3. Presence of Formulating Plants.

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety.

Policies are oriented towards the establishment of hygienic services and preventive measures in the workplace and environment. MPH has passed laws and regulations, set safety standards and disseminated information regarding diagnostic parameters for occupational diseases.

II. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. Lack of knowledge regarding acute and chronic effects of pesticides.

2. For small scale industries, there is a lack of technical expertise, lack of medical services and poor health and safety standard in the workplace.

18.4 India

H. Authority and Agencies responsible for Industrial Hygiene and Occupational Health and Safety.

National Institute of Occupational Health,
B. Pesticide Usage/Production/Hazard Category/Formulating Plants.

1) Pesticide Used:
   a) Fungicide
   b) Insecticide
   c) Weedicide
   d) Rodenticide
   e) Fumigants

2) Pesticide Produced:
   a) Insecticides
      - DDT
      - BHC
      - Phosphide
      - Endosulfan
      - Malathion
      - Others
   b) Fungicides
      - Carbendazin
      - Dithiocarbamates
      - Copper Oxychloride
      - Others
   c) Herbicide
      - Butachlor
      - Isoptroturon
      - Others
   d) Rodenticides
      - Zinc Phosphide
      - Aluminium
      - Others
   e) Fumigants
      - Methyl Bromide

3) Hazard Category: (WHO)
4) Presence of Formulating Plants

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety:

1. Factories Act, 1948
2. Women's Compensation Act
3. ESI Act, 1948
4. Air (Prevention and Control of Pollution) Act, 1981
5. Atomic Energy Act, 1962
6. Coal Mines Amendment Act, 1970
7. Drugs and Cosmetics Act, 1940
8. Insecticide Act, 1968
   Insecticides Act, amended 1972
9. Water (Prevention and Control of Pollution) Act
11. Factories Act, Amended 1987 - gives the primary responsibility for prevention of occupational accidents and diseases to the manufacturer of the factory.
12. Indian Chemical Manufacturers Association 1987

III. Problems Involved in Industrial Hygiene and Occupational Health and Safety,

1. Majority of the small scale industrial units are not equipped with adequate safety and pollution control equipment.

2. Financial position of the small scale units do not permit installation of such equipment.

3. Government does not provide incentives to industries adhering to safety and health standards.

13.5 Indonesia

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

1. National Safety Council (NSC), 1982 - government body on policy and implementation for improvement of occupational health and safety.


Functions:

a) Conducts campaign on promotion of health and safety.
b) Offers incentives to industries - “Safety Awards.”

C. Ministry of Health - regulates and classifies hazardous materials controls production, circulation, packing and labeling of pesticides.

D. Ministry of Defence and Security - regulates use of explosive materials in government and industry.

E. Ministry of Industry - regulates use of poisonous materials in industry.

F. BIIH (Industrial Environment Forum - association composed of representatives from the industry, community and government.
Functions:

a) Disseminate information.
b) Sets up preventive measures.
c) Addresses environmental problems such as pollution and destruction of natural resources.

e) Ministry of Trade - controls importation and distribution of pesticides.

D. Pesticides Used at Production- Hazard Category Formulating Plant.

1. Pesticides Used:
   a) Procure
   b) Carbofuran
   c) BPMC
   d) Delapon
   e) Fenthoate
   f) Others

2. Pesticides Produced:
   a) Diazinon
   b) Carbofuran
   c) BPMC
   d) MIPC
   e) Glyphosate
   f) Normal phosphonomethyl glucine

3. Hazard Category - (WH0)
4. Presence of Formulating Plant


Adoption of a 5 year National Programme (Ministry of Manpower).

Objectives:

a) Occupational safety and health campaign.
b) Training and education on occupational safety and health.
c) Research through a safety and health laboratory.

d) Development of personal protective equipments.

e) Development and strengthening of occupational safety and health communities.

f) Implementation and strengthening of occupational safety and health policies.

D. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. More than 95% of industries are small and medium scale which have minimum knowledge, and awareness of cost-benefit returns of safety and health.

2. 87% of workers have only reached basic school education.

3. Low wages have significantly affected the workers health and productivity.

4. Industries are spread out in more than 16 provinces creating difficulties in inspection and transfer of information.

5. Limited number of government inspectors.

16.6 Korea

A. Authorities and Agencies responsible for Industrial Hygiene and Occupational Health and Safety.

Ministry of Labor - major administrative authority

Others:

1. Ministry of Agriculture, Forestry and Fisheries

2. Ministry of Health and Social Affairs

3. Ministry of Environment

b. Pesticide Usage/Production/Hazard Category/Formulating Plants

1. Pesticides Used/Produced:

   a) Fungicide

   b) Insecticide

   c) Herbicide

   d) Other

2. Hazard Category
Classification of Hazard according to Acute Toxicity of Formulated Products.

<table>
<thead>
<tr>
<th>Class</th>
<th>Oral Acute LD50 (mg/kg body weight)</th>
<th>Dermal Acute LC50 (mg/L air, 4 hr)</th>
<th>Inhalation Acute LC50 (mg/L air, 24 hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solids</td>
<td>Liquids</td>
<td>Solids</td>
</tr>
<tr>
<td>Extremely Hazardous</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Highly Hazardous</td>
<td>5 - 50</td>
<td>10 - 200</td>
<td>10 - 100</td>
</tr>
<tr>
<td>Moderately Hazardous</td>
<td>50</td>
<td>200</td>
<td>100 - 400</td>
</tr>
</tbody>
</table>

Note:

1. The classification is based on the acute toxicity data which are obtained by the toxicity tests for pesticides item notification.

2. The classification by acute inhalation toxicity is limited to the products which are volatile.

3. The terms "solids", "liquids" and "gases" refer to the physical state of the formulation when to be used.

Classification of Fish Toxicity

<table>
<thead>
<tr>
<th>Rank</th>
<th>TLM 48 hrs, ppm: for Carp</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.5</td>
</tr>
<tr>
<td>II</td>
<td>0.5 - 2</td>
</tr>
<tr>
<td>III</td>
<td>2</td>
</tr>
</tbody>
</table>

Note:

1. The rank of each formulation is determined by the toxicity to carp of its active ingredient which is obtained by fish toxicity test for pesticides item notification.
1. Industrial Safety and Health Laws - major law associated with industrial hygiene and occupational health safety.

Functions:

a) Formulates, executes and regulates industrial safety and health policies.

b) Insures safety and improvement of facilities in the workplace.

c) Disseminates instructions to the public regarding health and safety.

d) Coordinates, investigates and manages anti-disaster movement.

e) Supports, guides and controls health-related organizations.

2. Other related policies

a) Toxic Substances Control Laws - authorizes the Ministry of Environment to evaluate regarding new toxic chemicals prior to their manufacture, and to regulate production, use and disposal of toxic chemicals.

b) Water Conservation Laws - authorizes the Ministry of Environment to establish list of toxic water pollutants and set standards.

c) Air Conservation Laws - authorizes the Ministry of Environment to set emission standards of hazardous air pollutants.

d) Agro-Chemical Management Laws - authorizes the Ministry of Agriculture, Forestry, and Fisheries to regulate registration, production sale and use of agricultural chemicals; and to promote environmental conservation.


D. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. Poor working conditions in the plant
   - inadequate ventilation
inadequate personal protective equipment

16.7 Malaysia

2. Authority and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

- Ministry of Health
- Ministry of Human Resources
- Ministry of Agriculture
B. Pesticides Usage/Production Hazard Category, Presence of Formulating Plants.

1. Pesticide Used:
   a. Insecticide
   b. Fungicide/bactericide
   c. Herbicide
   d. Rodenticide
   e. Others

2. Pesticide Produced

List is not available.

3. Hazard Category — (WHO): IA, IB, I, II, 4, are used.

4. Presence of Formulating Plants

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety.

Factories and Machinery Act 1967 — for notification
Employee Social Security Act 1969 — for compensation

D. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. Lack of national policy.
2. Inadequate data collection and analysis.
3. Lack of expertise.
4. Lack of coordination.

16.3 Myanmar

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

1. Department of Health
2. Factories and General Labor Law Inspection Department,
   Ministry of Labor
3. Others
   Myanmar Agriculture Service, Ministry of Agriculture and Forests

B. Pesticide Usage/Production/Hazard Category/Formulating Plants.

1. Pesticide Used:
a) Insecticides

- Aldrin 5% dust
- DDT
- Dimethoate
- Monocrotophos 40 EC
- Fadan 4 G
- Fadan 50 S.F.
- Sumicidin 5 E.C.
- Sumicidin 20 E.C.

b) Fungicides

- Vitexin 17 G
- Vitexin 48 E.C.
- Daconil
- Tacesin

c) Herbicides

- Atrazine 80 W.P.
- Satumil 60 E.C.
- Herbit

2. Pesticides Produced

a) Fenitrothion 50 E.C. Organophosphate
b) Cypermethrin 10 E.C. Synthetic pyrethroid
c) Diazinon 40 E.C. Organophosphate
d) Phenthoate 40 E.C. Organophosphate
e) Endosulfan 25 E.C. Organochlorine

3. Hazard Categories: WHO: IA, IB, I are used.

4. Presence of Formulating Plants.

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety.

1. Factories Act, 1951
2. Workmen's Compensation Act, 1923
4. Mines Act, 1924
5. Boilers Act, 1924
6. Electricity Act, 1924
7. Pesticide Law, 1945 - regulates pesticide production and marketing.
8. Private Industrial Enterprise Law, 1929 - encourage private sector participation in production and marketing of pesticides.

D. Problems involved in Industrial Hygiene and Occupational
Health and Safety:

1. Inefficient labor inspection service.
2. Lack of training facilities for health inspectors.
3. Absence of specialized consulting services.
4. Need for establishment of laws and regulations regarding environments concern together with their enforcement procedures.

16.9 Pakistan

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

There is a orders. Law and an Environment Protection Council already in place. However, the provincial government of Punjab and Sindh, enforces their own respective legislation. Presently, active steps are being taken by the Environment Protection Councils to put into practical effect the provisions of law.


1. Pesticide Used

   - Acaricides
   - Fungicides
   - Herbicides
   - Insecticides
   - Nematicides
   - Rodenticides
   - Fumigants
   - Synthetic Pyrethroids

2. Pesticides Produced

   - DDT - presently banned
   - EHC - presently banned

3. Hazard Category: (WHO) 1B, 2, 3, 4 are used

   A process has been started to register products falling in category 4 and proceedings are currently under against several toxic products.

4. Presence of Formulation Plants


1) Environmental Protection Ordinance (1980): - enforces
provisions set up by the Federal Government.


9. Environmental Impact Assessment Standards (EIAs):

   1. Inadequate data collection.
   2. Ineffective enforcement agency.

10. Philippines

A. Authorities and Agencies Responsible for Industrial Medicine and Occupational Health and Safety.

1. Fertilizer and Pesticide Authority (FPA), Department of Agriculture.
   - Regulatory agency for all aspects related to pesticide production, use and importation.

2. Bureau of Working Conditions, Department of Labor and Employment (DOLE) - coordinates with the FPA; takes care of workers and oversees the working condition in the industry.

3. Department of Health - cooperates in the formulation of policies and guidelines.

4. Agricultural Pesticide Institute - association of companies handling pesticides tasked to assist in the implementation of the different programmes.

K. Pesticide Usage Production Hazard Category/ Formulating Plants.

1. Pesticides Used:

   Organophosphate
   Carbamates
   Organochlorine
   Pyrethroids
OP + Carbamates
OC + Carbamates
OC + Pyrethroids
Herbicides
Fungicides
Growth Regulator
Others

2. Pesticides Produced - not specified

3. Hazard Category (WHO):

<table>
<thead>
<tr>
<th>Category</th>
<th>Insecticide</th>
<th>Fungicide</th>
<th>Herbicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>18</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>III</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IV</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>

4. Presence of Formulating Plants.

C. Government Policies Towards Industrial Hygiene and Occupational Health and Safety:


2. Checking of Standards by FPA Audit Team is done during planned and spot investigations.

3. Compliance by industries is a mandatory prerequisite prior to granting of license to operate.

4. Violation of standards are met with cessation of work operations and revoking of granted license.

D. Problems involved in Industrial Hygiene and Occupational Health and Safety:

1. Organizational Aspects

   - Ineffective organizational set-up in terms of delegation of duties and responsibilities to subordinates.

   - Lack of functional safety committee.

   - Inefficiency of routine auditing.

   - Lack of training programmes for proper handling of pesticide chemicals.
2. Occupational Health Programs (OHP):
   - Establishment and implementation of an effective OHP.
   - Training of medical and paramedical personnel.
   - Compliance to periodic medical examination.
   - Lack or absence of local medical centers.
   - Under reporting of pesticide poisoning cases.

3. Industrial Hygiene
   - Lack of adequate ventilation and a health writer.
   - Improper method of washing of contaminated clothing and equipment.
   - Poor housekeeping practices.

4. Safety and Security
   - Inadequate or improperly placed emergency showers and eyewash facilities.
   - Inadequate training and facilities for fire fighting.

5. Environmental Protection
   - Improper manner of containment disposal and clean-up of pesticide spillage.

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Sri Lanka

A. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety.

Department of Labor

1. Factory Act division
2. Division of Occupational Hygiene

Others:

1. Department of Health
2. Faculty of Medicine, Colombo
3. Central Environmental Authority
4. Department of Agriculture
Registration of Pesticides - licensing authority

5. Pesticide association
6. Industrial Health and Safety Association

B. Pesticide Usage/Production Hazard Category - Formulating Plant.

1. Pesticides Used
Organophosphate
Organochlorine
Carbamate
Pyridazinone
Pyrethroid
Growth Regulator
Chlorophenoxy
Propionic Acid
Kainic Acid
Acetamide
Coumarin
Others

2. Pesticides Produced: none

3. Hazard Category - (WHO) 14, 18, 2, 3, 4 are used.

4. Presence of Formulating Plant
C. Government Policies towards Industrial Hygiene and Occupational Health and Safety.

1. Factories Ordinance No. 45, 1942 - covers workers' safety, health and welfare.
2. Control of Pesticide Act No. 22, 1980 - compulsory registration of all pesticide materials; regulates the importation, formulation, packing, labelling, storage, transport, sale and use of pesticide.

D. Problems involved in Industrial Hygiene and Occupational Health and Safety.

1. Sites of pesticide factories are not well planned.
2. Activities involving pesticides are performed manually.
3. Medical examination of workers are not regularly done.
4. Lack of Personal Protective Equipments and strict supervision in their usage.
5. Poor waste disposal:
   - reusing of containers
   - no pre-treatment of effluent water
6. Government priority for health and safety in industries is low.
7. No uniform health and safety standards for pesticide factories.
8. Lack of expertise.
10. Pesticide poisoning is the 6th leading cause of death.

II. Thailand

4. Authorities and Agencies Responsible for Industrial Hygiene and Occupational Health and Safety:

1. National Institute for the Improvement of Working Conditions and Environment (NICE), Department of Labor - promotes the improvement of working conditions of workers and their protection from occupational injuries and diseases; governs over NICE and 3 Regional Units.
2. National Occupational Safety and Health Information Center of Thailand (NOCIS) - collects and disseminates information on occupational safety and health.
3. **Industrial Safety and Hygiene Division, Department of Industrial Works (M.I.W):** responsible for keeping the factories safe.

**Functions:**

a) Approves the license applications of factories.
b) Sets industrial safety and hygiene standards.
c) Evaluates safety and health hazards.
d) Provides training services and dissemination of health information.
e) Conducts safety inspections.

4. **Occupational Health Division, Department of Health**
   - WHO Collaborating Center

**Functions:**

a) Evaluates worker's health problems.
b) Conducts feasibility studies on primary health care.
c) Undertakes training programs (WHO) in occupational medicine and toxicology.
d) Exchanges information with WHO on occupational health matters.

5. **Educational Institutions**

a) Occupational Health and Safety Department, Faculty of Public Health, Mahidol University (OMSH).

b) Occupational Health Division, Health Sciences Department, Suranaree Thammasart Open University (OHS).

c) Industrial Engineering Department, School of Engineering, Chulalongkorn University (EIC).

6. **Pesticides Usage/Production: Hazard Category Formulation Plant.**

**I. Pesticides Used**

a) Insecticides
b) Herbicides
c) Fungicides
d) Rodenticides
e) Fumigants
2. Pesticide Produced
   a. Organic
      a.1 Organophosphates - Parathion, Foliox, Malathion, Dimethoate, Mepronex
      a.2 Carbamates - Carbanil
      a.3 Organochlorines - DDT, Aldrin
      a.4 Pyrethrums - Permethrin
   b. Inorganic Chemicals
      a. Arsenic
      b. Thallium
   c. Biological Insecticide
      a. Dipel

3. Hazard Category: (WHO)

4. Presence of Formulating Plants

C. Government Policies towards Industrial Hygiene and Occupational Health and Safety
   - Government supported.
   - Follows policies provided by National Economic and Social Development Plan (1991-1998).

Objectives:

a) To establish regional institute to monitor safety conditions, and to supervise and train personnel in the provincial areas regarding work safety and occupational health.

b) To inform agricultural sectors regarding usage of chemical substances.

c) To develop safety inspection and occupational health system emphasizing on a tripartite system.

d) To develop a major Hazards Control System to ensure safety in the workplace.
e) To conduct technical training and continuing education health and safety personnel.

f) To encourage the public and private agencies regarding safety promotion.

D. Problems involved in Industrial Hygiene and Occupational Health and Safety:

1) Workers' lack of previous industrial experience.

2) Poor working conditions
   a) hygiene and safety practices
   b) ventilation
   c) worker's reluctance to use PPEs

2) Inadequate number of inspectors.

VI. AGENCIES REPORT

17.1 FAO's Activities on Distribution and Use of Pesticides:

Since more than 90% of pesticide produced in the world are used in agriculture, FAO has maintained an extensive programme covering all aspects of pesticide registration, use and control. The main thrust of the FAO programme in recent years has been the development of the International Code of Conduct on the Distribution and Use of Pesticides and in assisting countries in their implementation and in the application of its comprehensive subsidiary set of technical guidelines.

In order to ensure the effective implementation of the Code, FAO developed and currently executed several regional projects aimed at assisting member countries in promoting the safe and efficient use of pesticides. One of these is the FAO Regional Project on the Implementation of the International Code of Conduct on the Distribution and Use of Pesticides funded by the Government of Japan which covers 27 member countries in the Asia and Pacific region and by next year, will include another thirteen member countries in Latin America and the Caribbean. The project has been in operation since 1985. It concentrates on the promoting of safe and efficient use of pesticides through the provision of technical assistance in establishing and operating registration and control schemes among the participating countries and by conducting various training programmes on different provisions of the Code.
An important element of the Code refers to the responsibilities of government and industry in instituting measures to reduce health hazards and poisoning due to pesticide misuse, particularly in pesticide formulation and manufacturing plants. FAO is pleased to note that this workshop addresses this important issue and wishes the organizers and the participants success in their endeavor to promote industrial hygiene and occupational health safety standards for the region.

VII. LECTURES

15. General Information on Pesticides

15.1 Classification as to type, chemical groups, toxicity and hazards.

This area was discussed by Dr. Carmen F. Castaneda from the Department of Pharmacology, U.P. College of Medicine. Discussions involved the following topics: Pest and Pesticide Definition, Toxicity vs. Hazard Differentiation, LD50, and Pesticide Classification by type and chemical grouping.

Derivation of LD50 for formulated single or combination pesticides from the LD50 of the technical materials was explained. Types of pesticides (EL, Powder, Granules, etc.) were discussed including their applications. Classification of pesticides based on WHO guidelines was covered including modifications applicable to the country.

15.2 Acute and Chronic Effects of Pesticide Health

Dr. Nelia F. Cortes-Maramba of the Department of Pharmacology, UP College of Medicine, shared her views on the above topics including: No observable effect levels (NOEL), contributory factors affecting pesticide susceptibility of exposed workers, exposure circumstances, genetics, and other human characteristics, and the epidemiological pyramid of pesticide intoxication composed of acute, high and low level long term exposures. Chronic effects of pesticide exposure were discussed including enzymatic changes, neurotoxicity, behavioral changes and other effects. Acute effects and diagnosis based on toxidromes were discussed.
Open Forum

Questions centered mainly on the recommendation for a universal classification of pesticide applicable to participating countries and the neurotoxic effects of chronic exposure to parathyroids.

Principles and guidelines on Occupational Health Safety being Adopted Including Innovations.

Viewpoints of a developed country:

Historical and legal backgrounds were given concerning and the evolution of occupational health and safety in the United States. Responsibilities, objectives, and areas of operation of each agency and institutions such as NIOSH, OSHA and EPA were discussed.

The principle of air sampling and sampling techniques and procedures were covered at the later half of the presentation.

Viewpoints of a developing country was delivered by Dr. B. Sugavanam. A book entitled "Formulation of Pesticides in Developing Countries" by UNIDO was presented by the Speaker. Dr. Sugavanam discussed possible areas of exposure to pesticide in the developing country which include production, application, food residues, and environmental procedures.

Open Forum:

Questions in the open forum covered the areas of implementation of the Occupational Health and safety laws in the U.S. and the legal modification to existing U.S. labor laws. Some questions were on the field monitoring of pesticide and inert materials in the pesticide.

Implementation of Occupational Health and Safety

Viewpoints of a government agency in a developing country (Philippines) Fertilizer and Pesticide Authority.

Dr. Nella C. Maramba, in behalf of FPA, gave the presentation which covered three major areas: historical and legislative accounts leading to the creation of the Fertilizer and Pesticide Authority (FPA); FPA's objectives, functions, and areas of responsibility, and the approach FPA has taken in improving the Occupational Health and Safety.
situation of the industry. It was noted that FPA not only takes care of agricultural pesticide but also takes care of household pesticides.

20.2 Viewpoints from Department of Labor and Employment

The Bureau of Working Conditions under the Department of Labor and Employment was presented by Dr. Wilson Estrada. Topics covered were: the historical and legislative actions that led to the creation of existing agencies within the Department of Labor involved in Occupational Health and Safety; the manner by which Occupational Health and Safety Programs are being administered; the Bureau of Working Conditions and its activities which include Enforcement of Health and Safety Standards, Training and Public Information, Research and Technical Services.

20.3 Viewpoints from the Department of Health

Dr. Aida V. Alvarez of the Department of Health Malaria Services control Program presented a working framework regarding the approach of the Department of Health on Occupational Health and Safety. Information was given on the Malaria Control Program, pesticide use and related problems as well as future plans.

20.4 Open Forum

The questions asked covered the areas of monitoring and evaluation of small pesticide formulators, strategies ensuring proper handling at the farmer's level, and application of pesticides through certified pesticide applicators. The education and training strategies were also discussed.

20.5 Industry

The occupational health and safety program of Shell Chemical Company of the Philippines was discussed by Macodela Cobin, Operations Manager. The company's safety policy was presented. The basic approach in hazard identification, risk assessment, and control measures undertaken by the company were presented. Action goals were enumerated covering areas such as those of Health, Safety, Environment and Quality Assurance.

20.6 Open Forum

Questions asked of Mr. Cobin covered areas of product stewardship specifically companies subcontracted to
formulate Shell products and disaster planning for communities residing around the formulating plant.


21.1 Dr. Nelia F. Cortes-Maramba from the Department of Pharmacology, UP College of Medicine talked on To 100%uance in Occupational Health Safety. She stated here that multifactorial forces are at work that are bearing on work-related accidents and diseases. These causal factors involve human, environmental, and social factors as well as occupational and environmental aspects. Thus, in cases of accidents, the worker is not solely responsible. To accoutance on the other hand involves the active investigations and proper actions on different toxicological risks with the view of minimizing these risks. In line with pesticide industry, there are still many things to be done in improving the reporting and investigations as part of toxico vigilance as well as the determinations of causal or direct effects of chemicals involved in work-accidents and injuries.

It was commented by a local participant that occupational injuries reached 1 million per year in the Asia-Pacific Region and that the reporting scheme in the Philippines is bad.

It was pointed out by another participant that community involvement in industrial chemical disaster preparedness is a crucial concern.

21.2 Emergence Management of Pesticide Poisoning was delivered by Dr. Kenneth Hartigan-Go from the Department of Pharmacology, UP College of Medicine. This was a lecture to educate the participants in establishing basic first aid standard operating procedures and principles, with the view that it be adapted in local situations. The importance of prevention and the rapid recognition and appropriate treatment were emphasized. Practical pointers in first aid management were discussed. Emphasis was given to the provision of basic life support such as airway, breathing, and circulation as a necessary component of poisoning management. All the first aid instructions may look simple and practical on the surface, however, to ensure its applicability, industry must create regular training skills for all concerned.
22. Industrial Hygiene and Environmental Concerns as these Relate to Worker's Health.

22.1 The first of this series was delivered by Mr. Dennis Gibbons, UNIDO Consultant. He highlighted the Principles and Guidelines in Industrial Hygiene in the Pesticide Industry. These are basically: recognition, evaluation and control of hazards. Evaluation refers to analysis of levels of exposures such as calculating average daily and peak exposure and comparing these with set standards. Control means engineering, administrative controls, and the utilization of personal protective equipment and clothing. Specifically, with application to pesticides, the following measures may be done: such as that of having written instructions on product labels, substituting to a lesser hazardous pesticide, a closed system with ventilation and personal protection only if and when indicated. He pointed that although there are many standards to follow, they are not always observed. Many workplaces are not always monitored even in the United states.

22.2 Ergonomics in the Pesticide Industry

Ergonomics in the Pesticide Industry was given by Dr. Joselito Gapas. He stated that ergonomics is not a separate scientific identity but a combination of many professional groups like chemist, engineers, the medical field, etc. The Principles of Ergonomics involve analysis and modification of tools, tasks and the environment or work station. Personal Protective Equipment clothing was considered as a last resort for protecting workers against pesticide chemicals. Emphasis was placed on the use of practical local solutions instead of being dependent on advanced and sophisticated western technology.

23. Good Manufacturing Practice

23.1 The Role of UNIDO was given by UNIDO Secretariat. The objective of UNIDO has been to assist developing countries to industrialize with the chemical industry. To date supporting 120 projects with the assistance of $100 million sourced from UNIDO, UNICEF, SIS, trust fund and cost sharing. The projects are focused on the least developed and the landlocked developing countries with the assistance varying depending upon the status and type of economy. Activities, varies from conducting feasibility studies to assisting in procurement, construction, quality control, and training. Quality and safety are promoted for products that are consistent and effective biological control, are safe and easy to handle, conform to registration and
established specifications and are properly packaged and labelled. Environmental and occupational safety are high priorities including vertical and horizontal safety awareness and management of discharges. The strategy is to replace the subsidy on pesticides by subsidizing cleaner technology, safer products and formulations, plant modernization, monitoring systems and waste management.

23. The Role of Industry was delivered by Dr. Vicente A. Guzman. The major asset to an industry is the employee whose protection is essential. Since Category I technical are being formulated, it is imperative to follow OSHA and develop processes to protect both the employee and the environment. Good engineering control of a factor can prevent into accidents but clean-up and decontamination of spills must be tended to immediately and also housekeeping, including waste disposal practices, in order to meet the safer working environment. Employee selection criteria have been established including educational attainment, family and social history and physical and medical examination. Before assignments are assumed, employees are trained in occupational health and safety providing time for acclimatization to protective equipment which is especially important in hot, humid countries. In these climates, timing of operation to the coolest periods and good ventilation are important in addition to reducing the occupational exposure period. Pre-formulation checks of operational safety and emergency equipment is essential. A supplemental power source is recommended if shortages are habitual. Monitoring of equipment and employee is required to maintain safety.

24. Good Laboratory Practice

24.1 Dr. Modesto Chua from the Philippine Institute of Pure and Applied Chemistry Laboratory talked on Good Laboratory Practice. GLP involves practices used by laboratories that will ensure the production of accurate and reliable test data which serve as basis for critical decisions that have financial, health and safety, and environmental consequences. Good laboratory practice involves good laboratory management in establishing proper sampling procedures, test methods, reporting systems, assurance of integrity of samples after testing, record keeping, staff management and quality control systems. In sampling procedures, proper handling, transport, storage and identification of samples are of utmost consideration. Test methods require interlaboratory proficiency, other testing trials and calibration of equipment.
Reporting of results should include control ID, authorize signature, test carried out on and modifications and description of test materials.

Management of laboratory staff should include and ensure that staff are competent and qualified to carry out particular tests and setting up of training programs for all members of each staff.

Importance of establishing quality control systems ensure that test results are accurate and reliable.

24.2 Prof. Elma R. Torres of the UP College of Public Health spoke on the Laboratory: Aspects of Health Monitoring. The monitoring of health involves two areas: the continuous monitoring of the work environment and biologic monitoring of workers. There are constraints, however, in health monitoring such as lack of trained technicians or analysts, limited laboratory equipment available for monitoring, high cost of chemical and equipment and the lack of quality assurance of laboratory data. Factors that must be considered in health monitoring are the required accuracy and sensitivity of equipment used in sampling and analyses, reliability of laboratory techniques and cost monitoring. The basic activities in conducting health monitoring are the review of workplace environmental conditions through walk through surveys, chemical inventory and process equipment review, the actual exposure measurement and the health monitoring.

25. Information Networking

Dr. S. P. Dhue conducted this session. RENPAP is an Asian regional project bringing together 12 countries having similar problems with the aim to exchange knowledge and know how to benefit production, marketing and legislation for pesticides. The objective is to promote regional cooperation in agricultural output through the safe use of pesticides and exchange expertise, information and development with the focus on the industrial aspects of production, control and handling. Six technical coordinating units have been established including formulation technology, quality assurance, specifications and impurities, regulations and bio botanicals, industrial safety, ecotoxicology, and waste disposal.

The RENPAP Gazette, a journal for industry and government to exchange information was first issued in October 1990.
An informative documentary video was presented by Dr. B. Sudavanam concerning problems encountered in pesticide production plants.

VIII. PLANT VISIT

27. Dr. Carmen Castaneda briefed the participants on the procedures for plant visits and the use of the PHA inspection checklist. The participants were divided into two groups (see Annex: Plant Visits) for the plant visits to Baker Philippines in Canlubang and Shell Chemicals Company in Pandanca. Facilitators for 1st group were Mr. Dennis Ubbons and Dr. Wilson Estrada and for the 2nd group, Dr. Joselito Gaya and Dr. Carmen F. Castaneda. Two buses were provided to transport the participants to the formulating plants. These plant visits were exercises in standardizing and harmonizing a method for evaluation of pesticide production plants.

IX. WORKSHOP

28. The participants were divided into three small groups which discussed common areas of concern and gave workable suggestions and solutions to perceived problems arising from this seminar workshop.

The recommendations of these small groups were presented in a plenary session.

X. CONCLUSIONS

29. After all the country reports and workshop discussions, it was found out that each country was their own problems ranging from regulatory programmes relating to Occupational Health Safety and Industrial Hygiene to the absence of standardize guidelines on the evaluation and assessment of pesticide production plants. Some countries do not have a common way based on WHO criteria hazard category to classify pesticides. There was also an awareness that a system of collecting data reporting occupational illness and accidents is wanting among pesticide production plants.

30. It also became evident that physicians and nurses involved in pesticide industry and government agencies have very little exposure and training as regards to occupational safety and health in pesticide production and use. There was difficulty in identifying the responsible people to assist in this training and standardization.
XI. RECOMMENDATIONS

Establishment/Strengthening of a Regulatory Programme in Occupational Health Safety and Industrial Hygiene and their Environmental Concerns in Pesticide Production Plants.

The Workshop

Acknowledging the valuable technical and financial assistance of UNDP/UNIDO REMAP and the participation of nineteen member countries in holding this workshop on Occupational Health Safety and Industrial Hygiene and their Environmental Concerns:

Recognizing the impact of a well-implemented occupational health safety and industrial hygiene programmes in pesticide production plants on the health, economy and ecology of the nation:

Noting that a number of member countries in the region still do not have such a regulatory programme:

And noting further that some countries in the region with established regulatory programmes experience some difficulties in enforcing their regulations either due to lack of expertise, institutional support, limited resources or inherent problems in their legislation:

Recommends

That in countries that have not yet established regulatory occupational health safety programmes take action to initiate the needed measures:

To those countries with regulatory programmes strengthen these programmes:

To that technical expertise be shared among countries in the Region through technical cooperation among developing
Harmonization Among Member Countries in Classifying Pesticide and their Formulations According to WHO Hazard Category.

Recognizing that pesticides have inherent toxicity and hazards;

Noting that the World Assembly through WHO has classified pesticides according to hazards to promote safety in use;

And further noting that not all member countries have adopted this classification of pesticides;

Recommends

That all member countries adopt the WHO classification of pesticides according to hazards thus harmonizing pesticide classification in the region.

Standard Guideline for Inspection of Pesticide Production and Formulation Plants

The Workshop

Recognizing a need for a standardized guideline for the evaluation of workplaces where pesticides are manufactured, formulated, or packaged;

Recommends

That UNIDO/RENAPF consider adoption of the guidelines for inspection developed for the conference and that this form be available to member countries for inspection purposes and pesticide production plants for suitable adoption.

Standard Form for Accident Investigation

The Workshop

Recognizing present lack of uniform reporting of occupational accident and illness data in member countries, and with special interest in pesticide-related occupational illnesses and injuries;

Recognizing a need to compile and document statistics about pesticide-related occupational injuries and illnesses to develop a valuable regional data base.
Recommends

That UNIDO/RENAPF initiate actions for the development and adoption of a standardized accident and injury form, establish an appropriate system of monitoring among member countries and designate the technical coordinator unit as the focal point for documentation and dissemination of information.

Establishment/Strengthening Regional Biologic Monitoring and Standardization Program

Considering the importance of biologic monitoring of workers exposed to pesticides in the effective implementation of occupational health safety programs and the importance of accurate and comparable data for each country in the network:

Further noting that women in reproductive age are employed in significant numbers in pesticide manufacturing and formulating plants in the region and their special biologic monitoring needs:

Recognizing that many countries in the region do not have access to accurate and standardized biologic monitoring facilities or are unable, due to limited resources, to establish their own facilities:

Recommends

That UNIDO/RENAPF survey the current capability of pesticide monitoring facilities and standardization of laboratories within the region.

Establishing Regional Panel of Technical Experts

Considering the central role of physicians and nurses in implementing occupational health safety in pesticide production plants:

Recognizing the need for additional and continued specialized training of physicians and nurses in the region with regards to occupational health safety in manufacturing and formulation plants:

Recommends

That RENAPF, through technical cooperation among developing countries (TDIC), to maintain a roster for panels of technical experts to provide appropriate in-depth training to physicians
and nurses on occupational safety in pesticide production formulation plants.

Networking and Information Exchange

The Workshop

Recognizing the value of information exchange and networking;

Realizing the importance of obtaining current information on occupational health safety and industrial hygiene from other countries;

And further noting that UNIDO/RENAP has a gazette for member countries:

Recommends

That government and private sector in member countries actively contribute and subscribe to the UNIDO/RENAP gazette.

Support of "Toxicovigilance"

The Workshop

Recognizing a regional need for greater awareness of occupational hazards associated with pesticide production and formulation, and the necessity to ensure safety in pesticide handling through a pro-active and sustained effort:

Recommends

That member countries advocate "Toxicovigilance" to further the occupational health safety measures among member countries.

XII. CLOSING CEREMONIES

II. The closing remarks were first given by Mr. Luis T. Yulita-Feal, Jr., Chairman of the workshop. He began by reminding us of the perspective of this meeting as stated at the beginning of the seminar-workshop. He summarized the different activities that transpired among member nations and participant delegates during the course of the seminar-workshop. He underscored the Philippine experience which can serve as a good learning opportunity for other member-states of RENAP to emulate.
This was followed by responses from the different foreign delegates.

Mr. M. H. Hale of Pakistan commented that this workshop is an ideal opportunity to widen our knowledge on industrial hygiene, occupational health and safety, and pesticide concerns. There is the need to implement these recommendations immediately. As a pertinent note, he thanked the supporting agencies and UNIDO RENPAC.

Mr. Lee Han Young of Korea thought of the usefulness of this seminar workshop. He intends to work for the establishment of poison centers in Korea to address the pesticide poisoning problems in his country.

Mr. Pradeep Cheepi of Thailand thanked the organizers of this meeting and commended the Philippines for its work in occupational health and safety in the pesticide industry. In this regard, he gave a brief situation in Thailand. He plans to create awareness on the issues of pesticide industry among occupational health and safety practitioners in his country.

Mr. E. F. Dhus, RENPAC Regional Coordinator, summed up the seminar-workshop proceedings and thanked the organizers and the sponsors of the workshop.

Mr. B. Suganathan, UNIDO Representative, gave his closing message that there is a need to harmonize the approach to promote occupational health, safety, and industrial hygiene in pesticide production. Inviting international agencies and regional local experts to promote technical cooperation, he commended the Philippines and local to other member states.

Mr. E. F. Dhus officially closed the workshop.
LIST OF DELEGATES

COUNTRY REPRESENTATIVES

AFGHANISTAN
Abdul Seboor Qadumi
General Manager, Supply and Distribution
Afghan Fertilizer Company
Kabul
Tel. No. 21528

BANGLADESH
Walju Rahman
Aerial Pest Control Officer
Plant Protection Wing
Department of Agriculture Extension
Ministry of Agriculture
Khamarbari Farmgate, Dhaka-1215

CHINA
Feipei Yao
Deputy Director
Institute of Occupational Medicine, CAPM
29 Nan Wei Road, Beijing 100050
Tel. No. 314145; 3016891; Fax No. 3014322

INDIA
Abhir Singh
Deputy Secretary
Ministry of Petroleum and Chemicals
New Delhi
Tel. No. 384209

INDONESIA
Agus Wahyudi
Head, Subdirectorate for Production,
Directorate for Aromatic Industry
Ministry of Industry
Jalan Gatot Subroto 52-53
Jakarta
Tel. No. 021-515509 Ext. 2448,
021-515260

MALAYSIA
Mohd. Yusoff Adon
Head of Occupational Unit
Health Services Division
Ministry of Health
Block E Pejabat Kerajaan, Jalan Dungun
Kuala Lumpur
Tel. No. 2540028
MYANMAR

U. Htun Hkun Thwin
Deputy Director
Industrial Planning Department
Ministry of Industry

PAKISTAN

M. H. Reo-
Director, Pakistan Rice Res. Council
Tropical Agricultural Research Institute
Karachi University Campus
Karachi
Tel. No. 47408

KOREA

Lee Hae Keun
Chief in Toxicol... Lab.
Agricultural Chemicals Research Institute
Buweon City, Republic of Korea
Tel. No. 292-7001

PHILIPPINES

Nicholas R. Deen
Deputy Executive Director II,
Fertilizer and Pesticide Authority
Rana Sulaman Building, Benoides Street
Malatai, Metro Manila
Tel. No. 818-51-15

SRI LANKA

W. Ranjit De Alwis
Deputy Commissioner of Labor
Division of Occupational Health
No. Jawatte Road, Colombo 5

THAILAND

Krissada Chadjul
Safety Professional
Industrial Safety and Hygiene Division
Department of Industrial Works
Banglampoo, Bangkok 10290
Tel. No. 281-7531
### LOCAL DELEGATES

<table>
<thead>
<tr>
<th>Company</th>
<th>Delegate(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AICHEM MANUFACTURING CORP., 8th Flr., Libert: Bldg., Paseo Road, Malati, Metro Manila Tel. No. 816-11-84</td>
<td>Jose J. Cruz General Manager</td>
</tr>
<tr>
<td>ALDI INCORPORATED, 3rd Flr., Phipinance Bldg., Benavidez St., Legaspi Village, Malati, Metro Manila Tel. No. 817-22-41</td>
<td>Noe Antonio D. Escueta Production Supervisor</td>
</tr>
<tr>
<td>ARCH-VEL INDUSTRIES, Suite F 5 Verdana I, 120 Amorsolo Street, Legaspi Village, Malati, Metro Manila Tel. No. 815-47-46, 88-37-12</td>
<td>Raulito R. Mendez Vice President</td>
</tr>
<tr>
<td>APO AGRO CHEMICAL ENT., INC., Biote, Norzagaray, Bulacan</td>
<td>Luz D. Manalo Company-House</td>
</tr>
<tr>
<td></td>
<td>Roberto M. Mariano Assistant Foreman</td>
</tr>
<tr>
<td></td>
<td>Pacquito V. Oris Administrative Assistant</td>
</tr>
<tr>
<td></td>
<td>Eusebio P. Velizos, Jr.</td>
</tr>
<tr>
<td>BAYER PHILIPPINES, INC., Equitable Bank Building, Ortigas Ave., Greenhills, San Juan, Metro Manila Tel. No. 721-60-11</td>
<td>Leonardo Almasan Market Development Manager</td>
</tr>
<tr>
<td></td>
<td>Marivic A. Garcia Asst. Plant Manager and Production Officer</td>
</tr>
<tr>
<td></td>
<td>Heinrich Feistmann Plant Manager</td>
</tr>
<tr>
<td></td>
<td>Fiorente F. Pasquel Registration Assistant</td>
</tr>
<tr>
<td></td>
<td>Anastacia E. Villacenc Company Nurse</td>
</tr>
</tbody>
</table>
BENSON INDUSTRIES
Hernan Cortes Street
Mandaue, Cebu City
Tel. No. 814-74

CHEMICAL APPLICATORS
T. Maril Road
United Paranaque Subd. II
East Sucat Road
South Super Highway
Paranaque, Metro Manila

CISH-SEIGY (PHILS.) INC.
3rd Flr, Asian Reinsurance
Building, Makati Metro Manila
Tel. No. 815-20-71 to 85

CITANID PHILS. INC.
6728 Paseo de Roxas
cor. Buendia Avenue
Makati, Metro Manila
Tel. No. 88-19-76

DOLE PHILIPPINES, INC.
8th Flr., Madrigal Building
Avala Avenue, Makati
Metro Manila
Tel. No. 88-13-11 to 18

DOW ELanco B.V.
7th Flr., Solid Bank Bldg.,
Paseo de Roxas, Makati
Metro Manila
Tel. No. 819-19-89 to 90
819-19-44 to 98

DU PONT FAR EAST, INC.
5th Flr., Solid Bank Bldg.,
Paseo de Roxas, Makati
Metro Manila
Tel. No. 87-07-11

Dutch Boy PHILIPPINES INC.
2245 Paseo Tino, Makati
Tel. No. 87-37-11

James C. Faw
Company Physician

Catalino S. Gebara
General Manager

Jose L. Leideron
Vp Technical Department

Rowena M. Hubo
Registration and Safety Mst.

Marina B. Ongser
Technical Manager

Anastacio B. Melendez, Jr.
Industrial Relations
Superintendent

Norberto E. Nenada
Research & Development Manager

Noli C. Arandure
Plant Supervisor

Benjamin C. Vitasa, MD, PHD
Consultant

Heda V. Fabeni
Company Nurse

Dulce S. Gill
Technical Manager

Catherine Hansen Bedovia
Brand Supervisor
FMC INTERNATIONAL, S.A.
4th Flr., Interbank Bldg.,
Paseo de Roxas, Makati
Metro Manila
Tel. No. 817-55-43

Hoechst Philippines, Inc.
Pioneer St., Mandaluyong
Metro Manila
Tel. No. 631-89-50

Jardine Davies, Inc.
222 Gen. Gil J. Puyat Ave.
Makati, Metro Manila
Tel. No. 315-82-81

Hoechst-Recitti & Colman, Inc.
2720 Pasong Tamo, Makati
Metro Manila
Tel. No. 810-07-01

Marsman & Company, Inc.
2246 Pasong Tamo Street
Makati, Metro Manila
Tel. No. 87-20-31; 88-97-01

Marsman Estate Plantation, Inc.
Sto. Tomas, Davao del Norte

Norman H. Sladen
Area Development Manager

Elenita R. Telesforo
F & I Administrator, HS

Myrna M. Namalisan
Production Manager

General Manager

Fausto L. Andres
Product Development Manager

Enrico F. de Guzman
Operations Manager

Eldio C. metals
Production Leadman

Ma. Biesta de E. Medina
Quality Control & Product Research Supervisor

Ma. Orchid E. Pereorino
Resident Nurse

Leonardo Lim Roa
Technical Manager

Maria Liza F. Francisco
Product Development Supervisor

Josefino C. Hono
Product Development Manager

Larry M. Rocodillo
Superintendent Research Department
MONSANTO PHILIPPINES, INC.
ARMC Bldg., SM. B-4
159 Amorsolo St., Legazpi Village
Makati Metro Manila
Tel. No. 818-39-30

Ruben L. de Leon
Country Director

Lita P. Endeta
Sr. QC Supervisor

Ponciano M. Halos
Product Dev. Manager

NIKICHIM CORPORATION
Makati Branch
Makati Metro Manila
Tel. No. 88-57-91

Gene Enriquez
Consultant

PHILIPPINE INDCOIL CORP.
3rd Flr., Metro House Bldg.
345 Sen. Gil Puyat Ave.
Makati Metro Manila
Tel. No. 815-17-12

Eunice Virginia R. Clarin
Nurse

Daniel C. De Vera
Production Manager

Jose C. Fernandez, Jr.
EVP & General Manager

Juan Crisostomo O. Rosero
DD Sup.

PIONEER TRADING & SUPPLY INC.
411 Quirino Ave., Paranaque
Metro Manila
Tel. No. 673-88-15

Luzviminda T. Asilo
Company Nurse

Jose M. Esperochoa, Jr.
Plant Manager

Necito C. Gumapac
Consultant

Victor Sumakote
Exec. Vice Pres.-Staff

Pascualitas B. Lazo, M.D.
Company Physician

PLANTERS PRODUCTS, INC.
PPI Building, Esteban St.,
Legazpi Village, Makati
Metro Manila
Tel. No. 316-20-57

Edwin P. Benavides
Prod. Supervisor

Marissa S. Jarin
Company Nurse Personnel Hst.
RHONE-POULENC AGROCHEMICAL PHILIPPINES INC. (FPAPI)
J.F. Rizal St., Brgy. Namaan
Mandaluyong, Metro Manila
Tel. No. 73-94-71

Leon M. Arceo
Plant Operations Manager

Damaso L. Cruz, Jr.
Quality Assistant and Safety Manager

Divina C. Juan
Company Nurse-Benefits Clerk

S. C. JOHNSON & SON, INC.
3379 Estrella Street
Makati, Metro Manila
Tel. No. 85-35-81

Carine B. Travin
Product Development Chemist

SUMITOMO CORPORATION
16th Flr., BPI M. O. Bldg.
A. ale Avenue, Makati
Metro Manila
Tel. No. 910-00-51

Roderico P. Bioco
Marketing Representative

TAUCHO CORPORATION
227 B. Padilla Street
San Juan, Metro Manila
Tel. No. 70-12-05: 70-31-25

Virginia Valdez-Chan
Chemical Engineer

THE SHELL CHEMICAL COMPANY
PHILIPPINES INC.
3rd Flr., Shell House
15 Valero St., Salcedo Village
Makati, Metro Manila
Tel. No. 816-65-01

Marites D. Padayatan
Company Nurse

Salvador E. Fernandez
Agrochem Research Manager

Cesar F. Goullan
Agricultural Dev. Manager

Jose D. Tianoco
Production Head

Nicanor L. Soriano
Safety Officer

TRANSWORLD TRADING
Don Fabio Bldg., Amorsolo St.
Makati, Metro Manila
Tel. No. 88-13-28

Ethelwaldo E. Lapiz
Market Development Asst.

WELLCOME PHILIPPINES, INC.
Don Fabio Bldg., Amorsolo St.
Salcedo Village, Makati
Metro Manila
Tel. No. 815-90-88

Jesus A. Fernandez
Manager, Environmental Health
OBSERVERS

CIBA-GEIGY SERVICES
Thailand
Tel. No. 551-1946

FERTILIZER AND PESTICIDE AUTHORITY
4th Flr., Rana Sulayman Bldg.
Benavidez St., Malate
Metro Manila
Tel. No. 85-55-01 to 05

RESOURCE PERSONS

DEPARTMENT OF INDUSTRIAL OPERATION
UNIDO, P.O. Box 700, A-1400
Vienna, Austria
Tel. No. 21135940 Telex: 125612
Telefax: 222156

FENFAP (UNIDO/UNDP):
United Nations Development Programme
7, Lodi Estate, New Delhi-110003
Cable: UNDEVFRO, NEW DELHI
Telex: 251-6661 UNDP IN,
Telefax: 29-11-697496

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE
1200 N Street, Room 315
Worker Health & Safety Branch
Sacramento, California USA 95814
Tel: (916) 445-8474

DEPARTMENT OF PHARMACOLOGY
UP College of Medicine
547 Peoro Gil Street
Manila
Tel. No. 521-92-51

Peter Francis Martin
Regional O. E. Manager

Benjamin F. Angeles
Consultant

Ephraim B. Gonzalez
Regional Coordinator
Region T, Cebu City

Dr. E. Sugavanam
Chief, Agro Industries Unit.
Chemical Industries Branch

Dr. B. F. Dhasa
Regional Coordinator

Mr. Dennis B. Gibbons
Sr. Industrial Hygienist

Dr. Nelia F. Cortes-Maramba
Professor
DEPT. OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH
College of Public Health
University of the Philippines
P.O. Box: EA 460
Ermida, Manila
Tel. No. 59-71-02

DEPARTMENT OF PHARMACOLOGY
UF College of Medicine
547 Pedro Gil Street
Manila
Tel. No. 521-82-51

DEPARTMENT OF PHARMACOLOGY
UF College of Medicine
547 Pedro Gil Street, Manila
Tel. No. 521-82-51

DEPT. OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH
College of Public Health
University of the Philippines
P.O. Box: EA 460
Ermida, Manila
Tel. No. 59-71-02

PHILIPPINE INSTITUTE FOR PURE & APPLIED CHEMISTRY (PIPC)
Loyola Heights, Quezon City
Tel. No. 96-73-64

BUREAU OF WORKING CONDITION
Dept. of Labor and Employment
Phoenix Building
Intramuros, Manila
Tel. No. 49-31-91; 49-65-74

DAVAO AGFITECH, INC.
Tandag, Davao Norte

THE SHELL CHEMICAL COMPANY (PHILIPPINES), INC.
Pandacan Installation
Pandacan, Manila

Prof. Elma B. Torres
Associate Professor

Dr. Carmen F. Castaneda
Assistant Professor

Dr. Kenneth Y. Hartigan-Go
Assistant Professor

Dr. Jocelito L. Gapes
Assistant Professor

Dr. Modesto T. Chua
Executive Director

Dr. Manuel Wilson O. Estrada
Chief L S R D

Dr. Vivencio L. Quinon
Vice President for Technical

Mr. Diosdozo F. Calin
Chemical Operation Manager
DEPARTMENT OF HEALTH
San Lazaro Compound
Sta. Cruz, Manila

FERTILIZER AND PESTICIDE
AUTHORITY (FPA)
4th Flr., Pasong Tamo Bldg.
Benavidez St., Makati
Metro Manila
Tel. No. 813-51-15, 85-50-01 to 04
Tele.: No. 23176 FPA Ph

Dr. Aida E. Alvarez
Medical Officer V
Malaria Control Service

Mr. Luis T. Villa-Real, Jr.
Executive Director III

Ms. Hilda W. Ongas
Chief, Trade & Industry
Development Specialist
AGENDA

REGIONAL WORKSHOP ON INDUSTRIAL HYGIENE
AND OCCUPATIONAL HEALTH SAFETY
AND THEIR ENVIRONMENTAL CONCERNS

The Manila Peninsula Hotel
Balagtas-Balmori Room
April 15-20, 1991

Sunday, April 14, 1991

Arrival of participants in Manila.

EMCEE/Moderator: Mr. Cesar F. Quillan

Day 1 – Monday, April 15, 1991

8:00 – 9:00 – Registration of Participants

9:00 – 10:30 – Opening Ceremony

Philippine National Anthem

Invocation

Mr. Ruben De Leon
Country Manager
Monsanto Philippines

Welcome Address

Hon. Senen C. Bacani
Secretary, Department of Agriculture

Message

Mr. Kevin McGrath
UNDP Resident Representative

Message

Mr. Christian A. Newman
UNIDO Country Director

Message

Dr. R. Sugavanam
UNIDO, Vienna

Message

Dr. S. F. Dhua
Regional Coordinator
RENFAF Project

Introduction of the Guest Speaker

Prof. Elma E. Torres
Dept. of Environmental & Occupational Health
10:30 – 11:00 —  E A T

11:00 – 11:30 — a. Election of Chairpersons and appointment of Rapporteurs
   1) Over-all Chairperson
   2) Daily Chairperson
   3) General Rapporteur
   4) Rapporteur per Topic
   b. Adoption of Agenda

11:30 – 12:30 — COUNTRY REPORTS
   * Afghanistan
   * Bangladesh
   * China

12:30 – 13:30 — LUNCH BREAK

13:30 – 15:40 — COUNTRY REPORTS
   * India
   * Indonesia
   * Islamic Republic of Iran
   * Republic of Korea
   * Malaysia

15:40 – 16:10 —  E A T

15:40 – 17:45 —  * Myanmar
   * Pakistan
   * Philippines
   * Sri Lanka
   * Thailand

Welcome Dinner
EMCEE/Moderator: Dr. Fonciano N. Halos

Day 2 - Tuesday, April 16, 1991

Topic: General Information on Pesticide

8:00 - 9:30
a) Classification as to Type, Chemical Groups and Toxicity and Hazard
b) Acute and Chronic Effects of Pesticide on Health

- Dr. Carmen F. Castaneda
  UP College of Medicine, Manila

8:30 - 9:00 BREAK

Topic: Principles and Guidelines on Occupational Health Safety Being Adopted, Including Innovations

9:45 - 11:00 Developed Country (OSHA/NIOSH/EPA)
- OSHA (USA) Representative

11:00 - 11:45 Developing Country
- UNIDO Representative, Vienna

11:45 - 12:30 OPEN FORUM

12:30 - 13:15 LUNCH BREAK

Topic: Implementation of Occupational Health Safety

Government - Developing Country
- Philippine Representatives

13:15 - 13:45 Fertilizer and Pesticide Authority

13:45 - 14:15 Dept. of Labor and Employment

14:15 - 14:45 Department of Health

14:45 - 15:15 OPEN FORUM

15:15 - 15:45 BREAK

15:45 - 16:15 Government - Developed Country
- Representative, Japan

16:15 - 16:45 Industry
- Mr. Deodado Caban

16:45 - 17:00 OPEN FORUM
Day 3 - Wednesday, April 17, 1991

**Topic:** Occupational Health Safety and Management of Poisoning

8:00 - 9:00 - Toxico vigilance in Occupational Health Safety
- Dr. Nelia C. Maramba
  UP College of Medicine, Manila

9:00 - 9:45 - Emergency Management of Pesticide Poisoning
- Dr. Kenneth E. Hartigan-Go
  UP College of Medicine, Manila

9:45 - 10:15 - OPEN FORUM

10:15 - 10:30 - BREAK

**Topic:** Industrial Hygiene and Environmental Concerns As These Relate To Worker's Health

10:30 - 11:15 - Ergonomics in the Pesticide Industry
- Dr. Joselito Gapas
  UP College of Public Health

11:15 - 12:00 - Principles/Guidelines on Industrial Hygiene in the Pesticide Industry Including New Innovations
- Mr. Dennis Gibbons
  UNIDO Consultant

12:00 - 12:30 - OPEN FORUM

12:30 - 13:30 - LUNCH BREAK

13:30 - 13:45 - Briefing on Plant Visits
- Dr. Carmen E. Estaneda
  UP College of Medicine

13:45 - 17:00 - Plant Visit
  Shell Chemical Plant
  Niver Chemical Plant

Dinner AFIP
EMCEE/Moderator: Mr. Jose I. Caloeran

Day 4 – Thursday, April 18, 1991

Topic: Standards For Quality Assurance

8:00 - 9:00 – Good Manufacturing Practice (GMP)

8:00 - 8:30 – Role of UNIDO
  - Dr. B. Sugavanam

8:30 - 9:00 – Role of Industry
  - Dr. Vivencio L. Duwon

9:00 - 10:00 – Good Laboratory Practice (GLP)

9:00 - 9:30 – Phil. Institute of Pure & Applied Chemistry Laboratory
  - Dr. Modesto Chua

9:30 - 10:00 – Laboratory Aspects of Health Monitoring
  - Prof. Elma B. Torres
  College of Public Health

10:00 - 10:30 – OPEN FORUM

10:30 - 10:45 – BREAK

Topic: Information Networking

10:45 - 11:30 – Information Exchange

11:30 - 11:45 – OPEN FORUM

11:45 - 12:00 – Group Reports on Plant Visits

12:00 - 12:30 – LUNCH

12:30 - 14:30 – Statements of International Cooperating Agencies

14:30 - 15:00 – Workshop Assignments
  - Dr. Nella C. Moramba
  UP College of Medicine

15:00 – FREE
EMCEE/Moderator: Mr. Norberto S. Mendoza

Day 5 - Friday, April 19, 1991

8:00 - 9:00 - Group Workshop
9:00 - 9:15 - BREAK
9:15 - 10:30 - Presentation/Discussion of Workshop Recommendations
10:30 - 11:30 - BREAK FOR PARTICIPANTS

Meeting of Organizing and Documentation Committee

12:00 - 13:30 - LUNCH BREAK
13:30 - 14:30 - Adoption of Recommendations/Report
14:30 - 16:30 - Closing Ceremony

Closing Remarks:
- Chairperson of the Workshop
- Response from the Participants
  (Thailand, Pakistan, Korea)

Messages:
- RENPAP Regional Coordinator
  - Representative, UNIDO, Vienna

Introduction of the Guest Speaker:
- Atty. Nicholas R. Deen

Closing Address:
- Hon. Ruben D. Torres
  Secretary, Dept. of Labor and Employment

Distribution of Certificates
Merienda Cena
RECOMMENDATIONS
made in the Workshop on Industrial Safety Related
to Environment Protection and Effluent Control in
Pesticide Industry, Surabaya, Indonesia, 10-14, December 1990

The Workshop adopted the following recommendations.

i) Having considered the existing infrastructural facilities available in the Region, both in well-developed and relatively less developed countries;

and having taken into account the need for process modification and plant design upgrading requirements in respect to production of active ingredients and their formulations which are not subject to patent coverage;

and also, having felt the need for new formulation, packaging and application technologies; locating safer and cleaner technologies;

The Workshop recommends that:

UNIDO/RENPAP mechanism be used to provide the member countries with assistance for process modification, revamping of existing plants, and provide guidelines on plant designs meeting the basic minimum safety requirement, both for production of active ingredients and their formulation.

ii) Being concerned over the lack of facilities for exchange of information among the member countries of the Region in the areas of production, formulation, packaging and application technologies.

The Workshop recommends that:

UNIDO/RENPAP assist in strengthening the existing National facilities for data collection and dissemination of information in these areas.

iii) The workshop having discussed the necessity for the member countries to have uniform minimum safety standards with respect to active ingredient production and their formulation;

and taking into account the need to identify appropriate protective clothing and equipment to be used in both active ingredient and formulation production plants; the need for assistance on safety audits/review of said plants.
and also, the need for advice on relocation or rezoning of existing pesticide plants;

The workshop recommends that:

UNIDO/RENPAP provide/develop information on minimum safety standards for pesticide production and formulation activities; provide guidance on identification of the appropriate protective clothing and equipment suitable for use in the Region; assist member countries in carrying out/implementing periodic safety audits/reviews in pesticide plants.

iv) Taking note of the problems of waste disposal and the hazards associated with it; and the general non-availability of practical guidelines on waste minimization, containment, waste inventory monitoring, and treatment and disposal systems; and also the need for laboratory equipped with the right manpower and facilities to identify and quantify waste material;

The workshop recommends that:

- Each member country categorize waste from pesticide industry and consider to what extent these can be recycled/reused.
- UNIDO/RENPAP provide assistance in the establishment of methods by which non re-usable waste could be properly utilized/managed.
- UNIDO/RENPAP conduct a survey and draw out practical guidelines on waste minimization, containment, waste inventory monitoring, and treatment and disposal systems.
- UNIDO/RENPAP extend assistance in developing laboratory capability for waste identification and quantification by way of consultancy services and manpower training.
- UNIDO/RENPAP to consider the 1998 Jakarta meeting recommendations and speed up the setting of effluent standard limitations for pesticide industries in the region.

v) Realizing the need for making management and workers of medium and small scale industries aware of the hazards involved in plant operation;

The workshop recommends that:

- UNIDO/RENPAP assist in the development of suitable training modules directed towards creating awareness among management and workers of the potential hazards associated with plant operation.
- Member countries use RENPAP media for creating awareness among all concerned.
The report gives a detailed summary of the workshop proceedings on the important topic of Occupational Health and Safety in Industries dealing with pesticides. This workshop was preceded by another workshop in Indonesia in December 1990 covering Effluent Control and Waste Management in Pesticide Industries. Both the workshops together made a complete package for the promotion of safety in chemical industries especially those dealing with toxic chemicals and producing hazardous waste. For easy reference, recommendations of the Indonesian workshop is also included in this report as annex 3.

Both the workshops made use of local expertise to co-ordinate the workshops to provide high level technical inputs using local expertise and arrange field visits.

The recommendations made are very important and they should be followed up at the governmental level, industry level and the international agency level to promote safety in chemical production.

This UNIDO activity on safety in the pesticide industry along with FAO's Code of Conduct would go a long way in promoting overall safety in the management of pesticides both at the production and the user ends.