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REGIONAL NETWORK ON PESTICIDES FOR ASIA AND THE PACIFIC

DP/RAS/88/031

BANGLADESH

Technical report: Findings and recommendations*

Prepared for the Government of Bangladesh
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Jiri Dostal,
consultant in environmental toxicology

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Vienna

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Explanatory notes

During period of consultant mission in Dhaka, Bangladesh
1 US \$ = 38.38 TK.

Abstract

The report covers one month consultancy at the Plant Protection Wing of Department of Agricultural Extension in Dhaka, visits in Agricultural Pesticide Protection Factories and discussions with authorities in the field of pesticides application in Bangladesh in the frame of REGIONAL NETWORK ON PESTICIDES FOR ASIA AND PACIFIC DP/RAS/88/031.

In Bangladesh there is no facility for improve training of pesticide quality control, residue analysis and environmental toxicology.

A new Laboratory for Pesticide Control and Education should be set up. The Department on Agricultural Extension is unable to guarantee an education of experts of analytical chemistry of pesticides, their residues, and environmental toxicology. Recommendations for improving the situation are given in details.

Agricultural Pesticide Formulating Factories in Bangladesh are at good technical level and they don't threat environment excessively. To minimize their impact to environment they should be equipped with incinerators.

I. INTRODUCTION

This report was elaborated by Jiri Dostal, Consultant Environmental Toxicology during his mission at Plant Protection Wing, Department of Agricultural Extension Khamarbari, Dhaka, Bangladesh from 28-th February, 1992 to 26-th March, 1992. (Job description see Annex I). Programme for UNDP Consultant on Environmental Toxicology was drawn up by Plant Protection Wing, Department of Agricultural Extension, Khamarbari, Dhaka (see Annex II).

The objectives of the project were:

- 1/ to advise on the type of facilities that could be established in Bangladesh to provide training and carrying out experiments to follow the fate of chemicals in water, air and soil matrices,
- 2/ visitation of pesticides industries to assess the measure taken regarding effluents and disposal of spoiled pesticides,
- 3/ lecturing and participation in the discussions regarding environmental hazards related to pesticide export based on expert finding and recommendations.

The Programmes outlined in Annex I and Annex II were accomplished. There are another three technical reports concerning to a certain extend some objectives of this report. These are:

- 1/ Two technical reports which were done in the frame of UNDP/FAO Project Report BGD/80/003 Strengthening Plant Protection Services. Pesticide Quality Control. " Report on work carried out at the Pesticide Laboratory Plant Protection Division, Department of Agricultural Extension, Dhaka 1986.1987", Consultant Mr. Brian Crozier.
- 2/ Technical report " Consultation on pesticide residue analysis at Plant Protection Wing, Department of Agricultural Extension, Dhaka" (1987), Consultant Mr. Naresh Chandra Atreya.

Background

Of the total pesticide used in Asia and Pacific region 0,5 % is used in Bangladesh. In terms of Active Ingredient in 1989 - 90 total consumption of pesticides stood about 1000 M.T. (about 6253 M.T. formulated). In 1990 - 91 the consumption of pesticides

enlarged to about 1111 M.T. (about 6948 M.T. formulated). Of the total crop area (13, 360. 323 ha) only 4 - 5 % is treated with pesticide once a year. On an average 15 - 20 % crops are attacked by pest under normal situation causing annual crop losses worth TK 20 billion.

Bangladesh is primarily agricultural country. in which pesticides play a vital role. In Bangladesh at present there are about 250 No. of pesticide registered for Agricultural use and 53 No. for Public health pest control.

The total consumption of Insecticide in 1990 - 91 made 6418 M.T. (formulated), Herbicide 76 M.T. (formulated) and Public Health 115 M.T. (formulated).

Of pesticides used in Bangladesh Organophosphates and Carbamates play key role.

Organophosphorous insecticides act on nervous system by inhibition of acetylcholinesterase at the synapse. In this they share a common site with carbamates. Messages are transmitted across the nerve synapse by a transmitter substance, and acetylcholine serves that role in cholinergic junctions. Insecticides that act on the nervous system disrupt the normal transmission of stimuli, and when this is depressed beyond a certain critical level. involuntary processes such as heart beat and respiration are no longer controlled and the death results.

From the environmental point of view. pesticides are environmental chemicals with distinguish side effects. Side effects of pesticides in the environmental appear in the abiotic environment (as residues in soil. water. and air). in plants (e.g.phytotoxicity). in animal (e.g. physiological effects). in man (e.g. effects on exposure) and in target organism (e.g. development of resistance).

In Bangladesh at present there is no facility to detect the pesticide residue after spraying vegetables or any other crops with pesticides. Farmers are very much interested in using highly toxic pesticides on vegetables which are effective in killing pest. Protective clothing. respirators. gloves and other personal protective equipment for the users of pesticides are too expensive and farmers are not well trained to use these. The customers of pesticides in Bangladesh are mostly illiterate farmers.

II. PESTICIDE LABORATORY AT DEPARTMENT OF AGRICULTURAL EXTENSION AT KHAMARBARI

According to The Pesticide Rules 1985, chapter VI " Advisory Committee and Pesticide Laboratory " the Pesticide Laboratory was set up. This laboratory is due, among others:

- 1/ to analyse samples of materials for residue analysis,
- 2/ to determine the efficiency and toxicity of pesticides,
- 3/ to follow methods of Association of Official Agricultural Chemists USA (AOAC). methods of WHO specification of pesticides, methods of Collaborative International Pesticides Analytical Council (CIPAC) and others e.g. Environmental Protection Agency USA (EPA) etc.

The Pesticide Laboratory is the section of Plant Protection Wing of Department of Agricultural Extension at Khamarbari, Dhaka.

This laboratory is the only **Governmental Laboratory** of this kind in Bangladesh and at the time of set up, assistance both material and technical was given by German Technical Assistance Programme. The Pesticide Laboratory is engaged in:

- 1/ Pesticide analysis to check the declared specification before giving registration for marketing in the country
- 2/ Sudden collection of pesticide samples from formulation and repacking factories and check up the specification
- 3/ Analysis of pesticide samples sent by Inspectors collected from marketing places
- 4/ Inspection of pesticide formulation and repacking factories prior of permission their starts and also later on

Two GIC Instrument and one UV/Vis spectrophotometer is the heart of this laboratory. The laboratory is served by one Senior Chemist, two Chemists and three Technical Assistants. In 1987 Mr. H. C. Attreya gave the laboratory Staff some training on determining of chlorinated pesticide residue from soil and crop during his consultancy period for three weeks.

A small pesticide residue Analysis Laboratory are in initial position. One GC with both ECD and FID have established here. Now no body is involved in Pesticide residues analysis Laboratory.

Within Bangladesh there is at present no facility for improve training, or pesticide quality control, residue analysis in crops. food, water soil and environmental toxicology.

There is no fume-hood in this laboratory and in residue analysis it is essential to handle a large amount of volatile solvent during extraction and cleanup activities. When the vapour of solvent enters the atmosphere explosive condition can prevail. All electrical equipment used where flammable atmospheres exist, must be designed, installed and maintained so that it cannot create sufficient heat energy to cause fire or explosion. The Laboratory room should be classified as Zone II e.g. Zone in which a flammable atmosphere is not likely to occur in normal operation, and if it occurs it will only exist for a short time. In Laboratory there is no Emergency lighting, total ventilation and air conditioning to meet the standards. The floor doesn't meet safety standards. The laboratory benches also don't meet standards. The recommended lighting level for laboratory 300 - 500 Lux is not respected.

In order to evaluate the impact of the pesticides on food and environmental quality (water, soil and air), not only must metabolites be identified but the toxicity of metabolites must also be evaluated. For this purpose such procedures must be developed which detect toxic metabolites, parent toxicants as well as their quantities. To meet this goal a new analytical methods, procedures and technique must be introduced into analytical laboratory, especially modern capillary chromatography, high performance liquid chromatography (HPLC) and solid phase extraction technique (SPE). While modern capillary chromatography (GC) provides sufficient separation resolution, detection often involves using a variety of hyphenated technologies. Selective detectors focus on specific chemical and physical properties of molecules. If the molecules of interest contain characteristic heteroatoms such as chlorine or phosphorus. familiar two-dimensional GC detectors ECD (Electron Capture Detector) NPD (Nitrogen Phosphorus Detector). FPD (Flame Photometric Detector) are usually used. These detectors have very good sensitivity, but lack of three-dimensional information such as spectral data. Three-dimensional detectors, on the other hand, offer third dimension data that preclude artifacts. Such detectors are the results of successfully coupling existing, independent analytical techniques to chromatographic systems. The application of mass-selective detectors (MSD) and, more recently, infrared

detectors (IRD) are well known. The atomic emission detector (AED) is similar. In principle, a coupling of gas chromatography with atomic emission spectroscopy. For each point of the chromatogram (up to 10 Hz) a relevant part of the atomic emission spectrum is recorded, clearly verifying the presence of specific elements in the peak of interest. In this way it is possible to measure several element-selective chromatograms simultaneously, with considerable savings in time and labour. The direct, quantitative determination of elements in substance makes it possible to calculate total element content, elemental sumparameters and empirical formulae, as well as to perform component-independent calibration (CIC). Solid phase extraction (SPE) technique reduce procedural complexity, cleanup time, and solvent usage while providing acceptable reproducibility and analyte recoveries that are essential equivalent to traditional methods. There are many SPE systems available for sample extraction. Most of them have the capacity for multiple simultaneous extractions. All of these analytical methods can only run when they are supported by corresponding laboratory base, e.g. samples preparation laboratory, chemical stock, stock for apparatuses, glass, weighing room, washing room, staff check room etc.

III. AGRICULTURAL PESTICIDE FORMULATION FACTORIES IN BANGLADESH

Bangladesh has its own Agrochemical Formulation Industry in which process involving the physical modifying and/or mixing of the active ingredient with inert ingredients, such as solvents, mineral carriers, surface active agent or repacking can be realized.

At present in Bangladesh there is seven Pesticide Formulation Factories. These are:

- 1/ Ciba-Geigy (Bangladesh) Ltd., organophosphates formulator, Chittagong
- 2/ Padma Cil Co., Ltd., carbamates formulator, Chittagong
- 3/ ICI Bangladesh Manufacturers Ltd., herbicide Paraquat and sprayers formulator, Dhaka
- 4/ Rhône-Poulec Ltd.(Bangladesh),organophosphates formulator,Dhaka

- 5/ Shetu Pesticide Ltd., organophosphates formulator. Dhaka
- 6/ Limit Agroproducts Ltd., organophosphates formulator, Dhaka
- 7/ Data Enterprises Ltd., organophosphates formulator. Dhaka

There are a number of aspects related to the formulation of agro-chemicals. From the point of environmental protection the principal environmental threat is associated with the escape of contaminated water and pesticide waste disposal. Contamination from these sources can heavily pollute the area outside the site and is a particular threat to ground-water sources used for the supply of drinking water for human purposes. An effluent water from the formulation and filling operations must be chemically treated prior to discharge. The simplest recommended process is realized usually in three steps:

- 1/ Any solids contained in the effluent are first precipitated by the use of appropriate flocculating agents.
- 2/ Dissolved solids and organic liquids in the clear effluent are removed by treating with carbon.
- 3/ The sludges produced from flocculation and adsorption stages are run into air drying beds to be fully dried. When fully dried the sludges are transferred for subsequent disposal usually by incineration.

All pesticides of the organophosphorous, carbamates and pyrethroid types formulated in Bangladesh at present can be broken down by hydrolysis mixing with a 10 % solution of sodium carbamate or 5 % sodium hydroxide.

Four of the seven Agricultural Formulation Factories in Bangladesh were visited to find out if they meet general ecological demands and to compare these ecological demands with the present reality (see Annex 5).

All visited Agricultural Formulation Factories use hydrolysis procedure to break down pesticides in effluent. The treated effluent is discharged into the public sewers. The effluent quality control is carried out in laboratory by determining Chemical Oxygen Demands (COD). Biological Oxygen Demands (BOD) in Rhone-Poulec Ltd., Dhaka. Ciba-Geigy (Bangladesh) Ltd., Chittagong also check effluent quality

utilizing toxicological test based on International Standard (ISO) 7346 Water quality. " Determination of the lethal toxicity of substances to freshwater fish Hamilton Buchman ". The remaining two visited Agricultural Formulation Factories control effluents quality only by pH measuring.

Solid wastes with a high pesticide content require auxiliary maintenance of combustion. A suitable residence time at the temperature ranging at least at 900 °C to 1200 °C is necessary to achieve complete combustion and to prevent the source of such a chemicals that could be promoters of the cancerogenity. The suitable incinerators are not available in any of visited Agricultural Formulation Factories. Rhone-Poulec Ltd. intends to install modern type of incinerator by the end of 1992 year. This incinerator also allows liquid wastes to be completely combusted.

All Agricultural Formulating Factories producing granular pesticides are equipped with cyclone dust-separators to capture toxic dust and to prevent environmental pollution. Visited Agricultural Formulating Factories are well equipped for the case of emergency.

IV. LECTURING AND DISCUSSIONS WITH AUTHORITIES

During his stay at Department of Agricultural Extension in Dhaka consultant chaired seminars to discuss problems of pesticides production, formulation, application, fate and impact of pesticides to environmental balance. Seminars were attended by Officials of Plant Protection Wing. (see Annex 3). In the frame of panel discussion the acute problems of pesticides application and residues control were discussed in details. Consultant gave the Laboratory Staff lecturing on industrial toxicology, environmental toxicology and methodology how to trace the chemicals in environment (water, soil and air).

The meetings with the head of Department of Environment Dhaka and the head of Office of Pesticide Association of Bangladesh were

organised to exchange opinion on the problems associated with formulation, application and distribution of pesticides in Bangladesh (see Annex 4). The need to set up Laboratory Center to control pesticides and their metabolites in crop, food, vegetables, soil, water etc. was stressed.

V. CONCLUSIONS

In Bangladesh at present there is no facility to detect the pesticide residue after spraying vegetables or crops with pesticides. Within Bangladesh there is also no facility for improve training of pesticide quality control, residue analysis and environmental toxicology. Education of experts in the field of analytical chemistry of pesticides and their residues in Bangladesh is under these circumstances impossible.

At the Department of Agricultural Extension, Khamarbari, Dhaka there is the Pesticide Laboratory which is unable to carry out analysis and analytical procedures necessary to determine pesticides residues both in food, crop and environment. The Department of Agricultural Extension is unable to guarantee the education of experts on analytical chemistry of pesticides, their residue analysis and environmental toxicology.

A new Laboratory for Pesticide Control and Education should be set up as soon as possible in well planed building and equipped with upto date instrumentation, namely Gas Chromatograph, High Pressure Liquid Chromatograph and UV/Vis Spectrophotometer, audio-visual facilities and computers. Number of staff of this Laboratory should be increased by chemists and toxicologist. Laboratory should be supplied with adequate scientific literature.

Agricultural Pesticide Formulation Factories in Bangladesh are at good technical levels. They don't threat environment excessively. To minimize their impact to environment in case of disposal toxic pesticide wastes they should be equipped with incinerators.

RECOMMENDATIONS

A: Pesticide Laboratory

The consultant recommends the following recommendations to be realized as soon as possible in order to carry out pesticide and pesticide residues control in crops, food and environment (soil, water and air) and to provide education in this field of activity in Bangladesh:

1. Accomodation

To set up a new Laboratory for control pesticides and pesticide residues. This Laboratory shift in separate well planed building. (The existing Pesticide Laboratory at Department of Agricultural Extension at Khamarbari, Dhaka doesn't answer the technical demands on the laboratory at all, even being reconstructed).

2. Staff

Number of analytical chemists should be increased by chemists and environmental toxicologist.

3. Instrumentation

Purchase by Hewlett-Packard Company (H.P.):

1/ Hewlett Packard HP 5890 Series II Gas Chromatograph with MSD (mass-selective detector), IRD (infrared detector), AED (atomic emission detector).

2/ HP 7673 A Automatic Injector and Sampler

3/ Hewlett - Packard HP 1090 Series II Liquide Chromatograph

4/ Hewlett - Packard HP 8452 A UV/Vis Spectrophotometer with MS DOS control

Purchase by Varian Company:

Varian 300 Spectrophotometer with accessories

4. Equipment

Purchase of extra glassware for residual analysis

Purchase of following solvents:

Methanol, 1-Propanol, 2-Propanol (Isopropanol), 1-Butanol.

Isobutanol. Acetonitrile. Dimethylformamide. Acetone. Methyl

Ethyl Ketone, Tetrahydrofuran, Dioxane. Ethyl Acetate, Methylene Chloride, Chloroform, Carbon Tetrachloride. Carbon Disulfide,

Hexane. Benzene. Toluene. 1-chlorbutane.

Purchase by Hewlett-Packard Company columns and packings for Environmental Protection Agency (USA) methods. (EPA methods):

<u>EPA Method No.</u>	<u>Method title</u>	<u>H.P. Part No.</u>
505	Pesticides and PCBs	19091 S - 010
508.608	Organochlorine	19091 S - 010
	pesticides	19091 S - 011
515	Herbicides	09091 A - 102
		09091 B - 102
607	Nitrosamines	19095 J - 023
612	Chlorinated	19091 Z - 202
	hydrocarbons	
613	2,3,7,8 TCDF	-
8080	Organochlorine	19097 A - 006
	pesticides and PCBs	
8140	Organophosphorous	19097 A - 006
	pesticides	
8150	Chlorinated	19097 A - 006
	herbicides	
8280	PCDD. PCDFs	19091 B - 102

5. Personal Protective Equipment

Purchase of respirators. goggles. gloves and laboratory coats.

B: Agricultural Pesticide Formulation Factories

All Agricultural Pesticide Formulation Factories should dispose highly toxic pesticide wastes by incinerating or break down by hydrolysis carried out under controlled conditions.

Annex 1

JOB DESCRIPTION
DP/RAS/88/031/11 - 54

Post title	Consultant Environmental Toxicology
Duration	1.0 m/m
Date required	March 92
Duty station	Dhaka including travel within Bangladesh
Purpose of project	To provide a firm basis for the safe development of pesticides in the Asia and the Pacific region by mutual co-operation of the member countries of the Regional Pesticide Network.
Duties	The consultant, in collaboration with the National Coordinator of the project, is expected to discuss various aspects related to environmental toxicology with regards to the toxic chemicals used in Bangladesh. He should advise on the type of facilities that could be established in Bangladesh to provide training and carrying out experiments to follow the fate of chemicals in water, air and soil matrices. He would also visit pesticide industries to assess the measure taken regarding effluents and disposal of spoiled pesticides. He should also give lectures and participate in the discussions regarding environmental hazards related to pesticides export based on his findings and recommendations.
Qualifications	A chemist, chemical engineer, biologist, environmentalist or analytical chemist with extensive experience in environmental aspects related to the production and use of pesticides. Experience in developed countries would be an advantage.
Language	English

Annex 2

Programme for Dr.Jiri Dostal,UNDP Consultant on Environmental Toxicology. during his visit in Bangladesh from 28th February.1992 to 26th March.1992

D a t e	Time	Place	Programme	Arrangement of transport
28-2-1992	18.30	Arrival Zia Inter-national Airport Dhaka	Accomodation at Hotel Sonargaon	UNDP
29-2-1992	8 -14 hrs.	Plant Protection Wing,Khamarvari	Visit the Pesticide Laboratory	DAE
1-3-1992	8-14.30 hrs	UNDP Local Office Dhaka and Plant Protection Wing. Khamarbari.Dhaka	Call on UNDP Country Director and Director Plant Protection	DAE
2-3-1992	8-9 hrs	DAE. Khamarbari, Dhaka	Call on Director General.Deptt.of Agril.Extension	DAE
3-3-1992	9.30-14.30 hrs 8-14.30 hrs	Pesticide Laboratory,PFW.Khamarbari. Dhaka Plant Protection Wing	General Orienta-tion General Orientation and discussions on Laboratory safety and industrial hygiene	DAE
4-3-1992 and 5-3-1992	8.30-13 hrs	Plant Protection Wing,Khamarbari, Dhaka	Work at Pesticide Laboratory	DAE
6-3-1992		Holiday		
7-3-1992 and 8-3-1992 and 9-3-1992	9.30-13 hrs	Plant Protection Wing,Khamarbari, Dhaka	Analysis of hazardous chemicals by means of gas chromatography, UV/Vis spectrophotometer etc.	DAE
10-3-1992	6.30 hrs	Leave for Chittagong by air	Accomodation at Hotel	
	9 hrs 9.30-13 hrs	Arrival Chittagong Chittagong Sea Port	Visit storage and handling of pesticides in the Sea Port. Jamuna Repacking Plant Chittagong	

Date	Time	Place	Programme	Arrangement of transport
11-3-1992	9-12 hrs	Padma Oil Formulation & Repacking plant, Chittagong	Visit Agrochemical Formulation and Repacking Plant	DAE
	14-17	Ciba-Geigy Formulation & Repacking plant. Leave for Dhaka by train.	Visit Ciba-Geigy Formulation & Repacking plant.	
12-3-1992	9-13 hrs	Plant Protection Wing. Khamarbari. Dhaka	Discussion on finding with the Officials of Plant Protection.	DAE
13-3-1992		Holiday		
14-3-1992	9-13 hrs	Plant Protection Wing. Khamarbari. Dhaka	Discussion with the Officials of Plant Protection.	DAE
15-3-1992				
16-3-1992	9-13 hrs	Plant Protection Wing and Deptt. of Environment	Discussion with Officials of Deptt. of Environment.	DAE
17-3-1992	9-13 hrs	Visit Shetu Pesticide Plant Dhaka		DAE
		Visit Agrochemicals Formulation plant and Repacking plant		
18-3-1992	9-13 hrs	PPW and PAB	Discussion with the Chairman of PAB.	DAE
19-3-1992	9-13 hrs	Visit Rhone-Poulec Pesticide formulation plant, Dhaka		DAE
20-3-1992		Holiday		
21-3-1992	9-13 hrs	Plant Protection Wing, Khamarbari, Dhaka.	1. Preparation of report and other works.	DAE
25-3-1992			2. Call on Director Plant Protection, D.G., DAE & UNDP Country Director in Bangladesh.	
26-3-1992	20.40	Departure		UNDP

Annex 3

SENIOR COUNTERPART STAFF

Department of Agricultural Extension Khamabari, Dhaka

Mr. Shahidul Islam, Director General

Mr. S.A. Mumim, Director Plant Protection

Mr. Delwar Hossain, Deputy Director of Pesticide Administration
and Quality Control Section

Mr. Afiqur Rahman Khan, Chemist, Pesticide Administration and
Quality Control Section

Mr. Mahbub-Ur-Rahman Bhuiyan, Chemist Pesticide Administration
and Quality Control Section

Department of Agricultural Extension, Chittagong

Mr. Ibrahim Khalil, Deputy Director

Mr. Habibur Rahman, Quarantine Entomologist of Chittagong Sea Port

UNDP Office, Dhaka

Mr. C. Larsimont, Resident Representative

Mr. Jyri Kentala, Programme Officer

Annex 4

LIST OF PEOPLE MET

- Mr. Risalt Ahmed, Director General, Department of Environment, Dhaka
- Mr. Siraj A Chowduri. Technical Manager ICI Bangladesh Manufacturers Ltd.. Dhaka
- Mr. M.H. Kahn, Trial and Reg. Manager and Chairman Pesticide Association of Bangladesh. Dhaka
- Mr. M.A. Jalil. Ex-Chairman Pesticide Association of Bangladesh. Dhaka
- Mr. Chowduri Fazle Imam. Chief Chemist of Ciba-Geigy. Chittagong
- Mr. D. Cruze, Production Manager. Rect and Colman. Chittagong
- Mr. Kashem. Instalation Manager. Padma Oil Comp.. Chittagong
- Mr. M. Faizullah. Chemist Manager. Padma Oil Comp., Chittagong
- Mr. Ifzal Ahmed, Manager. Jamula Oil Comp., Chittagong
- Mr. Ratan Kumar Das. General Manager Shetu Pesticides Ltd. Shetu Marketing Comp. Semco, Dhaka
- Mr. M. Ansarali. Works Manager Rhône-Poulec Bangladesh Ltd.. Dhaka
- Mr. Chowdhuri M Nurallahah. Agrochemicals Development Manager. Rhône- Poulec Bangladesh Ltd.. Dhaka
- Dr. S. Mohammed Ullah. Associate Prof. Dept. of Science, Dhaka University
- Mr. M. Nuruzzaman, A student of Ph.D. Programme, Dhaka University

Annex 5

LIST OF COMPANY VISITS

Ciba-Geigy (Bangladesh) Ltd. Chittagong Pesticide Formulating
Factory

Padma Oil Company, Chittagong

Rhône-Poulec Bangladesh Ltd., Dhaka

Shetu Pesticide Ltd., Dhaka

UNIDO Substantive Comments

The report deals with the environmental aspects related to the use of pesticides in Bangladesh and regarding waste management in selected pesticide formulation plants.

The author clearly comes up with a proposal that the Quality Control and Residue Analysis Laboratories of the Plant Protection Wing needs upgrading to meet the requirements for safe pesticide development and management.

Despite earlier technical assistance provided to Bangladesh under BGD/80/003, there seems to be a need for additional assistance to Bangladesh.

Taking the recommendations into account, UNIDO is of the opinion that the Ministry of Agriculture and the Ministry of Industry should join hands to initiate a programme for the safe development and management of pesticide with respect to the safer formulation, quality control both at the production and user ends and final monitoring of the fate of pesticides in the ecosystem. UNIDO is willing to assist such a programme depending on a request from the Government and making available of IPF funds.