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**REGIONAL NETWORK ON PESTICIDES FOR ASIA
AND THE PACIFIC**

DE/RAS/85/023

TERMINAL REPORT

Prepared for the Governments of the Member States of the Regional Network (Afghanistan, Bangladesh, China, India, Indonesia, Pakistan, Philippines, Republic of Korea, Sri Lanka and Thailand)
by the United Nations Industrial Development Organisation,
acting as executing agency for the United Nations Development Programme
in co-operation with the Food and Agricultural Organisation of the United Nations,
the World Bank, the World Health Organisation and the Economical and Social Commission for Asia and the Pacific

Based on the work of Dr. S. P. Dhua, Regional Coordinator

United Nations Industrial Development Organisation

Vienna

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REPORT SUMMARY SHEET

1. Country	ASIA/PACIFIC REGION
2. Project title	REGIONAL NETWORK
3. Project No.	DP/RAS/85/023/0/01/037
4. Executing agency	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION.

1.0 BRIEF STATEMENT

1.1 Objectives and achievements

During the last six years, the project covered the entire spectrum of pesticides development in the region and some countries like India, Philippines and Thailand played a major role in the programme. The Regional approach to promote production, marketing and control of pesticides has been an innovative one with UNDP sponsored project which was executed in two phases - Phase I from 1982 to 1985 (DP/RAS/82/006) and Phase II from 1986 to 1989 (DP/RAS/85/023) with the assistance of international agencies, viz. UNIDO, FAO, WHO, ESCAP and the World Bank. The project activities covered 10 countries and executed regional consultations, workshops, expert group meetings on the following topics :

- Pesticide data collection systems (UNIDO/ESCAP)
- Formulation of Pesticides (UNIDO).
- Quality Control of Pesticides (UNIDO/FAO/WB).
- Harmonisation of pesticide registration requirements(FAO).
- Trade and tariff considerations (UNIDO).
- Pesticide residue analysis (UNIDO/FAO/WB)
- Toxicology forum (UNIDO/WHO).
- Environmental aspects of pesticide production and use (UNIDO).

The project succeeded in creating a spirit of regional cooperation in promoting an intimate understanding on the various aspects detailed earlier and also setting up of

an organisational structure to implement and monitor the various activities of the project. Both in the Phase I and Phase II, there has been increasing contribution from the member countries and at the end of the second phase, the contribution of the member countries was US\$ 894,000 as against the UNDP contribution of US\$ 848,644.

The immediate objectives of the project were :

1. To establish a regional information system for data on :

- a) Supply, production, marketing, distribution and use of pesticides;
- b) Trials on pesticide residues in food crops and soils;

2. To provide guidance on research and development activities conducted in the member countries, concerning pesticide production and utilisation.

3. To encourage the utilisation of local raw materials for the formulation of pesticides whenever suitable.

4. To harmonise pesticide registration requirements and control procedures to be observed among member countries of the Network.

5. To promote the understanding of toxic properties and effects of pesticides, and to provide guidance on human safety precautions and environmental protection measures.

6. To advise on pesticide residue trials to be conducted in accordance with international standards and methods.

7. To facilitate and utilise the effective and uniform quality control standards for the region, based on collaboratively tested analytical methods.

8. To continue the current exchange of information through publication of periodic bulletins by the Regional Network Unit, and mutual exchange or distribution of technical papers.

1.2 Outputs sought and produced

<u>Output sought</u>	<u>Output produced</u>
1) Information system	Expert group meeting on Data collection system was held in 1987 in Thailand. Most of the member countries submitted information based on the prescribed formats. Data received was collected, analysed and published in two special issues of RENPAP Gazette. Countries who could not respond to furnish information on the prescribed formats were assisted through experts in data collection based on PMC decision.
2) R&D on Formulation of Pesticides	<p>i) One fellow from Afghanistan was trained for one man month at PDPI Centre in 1988.</p> <p>ii) Two workshops on Pesticides Formulation Technology was organised in 1987 and 1989 in India. Thirty five fellows representing the participating countries of the region benefitted from this programme directly.</p>
3) Toxicology	A regional Forum on Pesticides Toxicology was held to consider a basis for Regional Harmonisation of Pesticides Toxicological requirements. The Expert group recommended the need for training on toxicology assessment and other related subjects. A consultant visited Pakistan and recommended establishment of a Eco-Toxicology Centre in Pakistan.
Occupational Health	A Consultant on Occupational Health Assessment visited Philippines and made valuable suggestions on health safety, etc.
Environmental Protection	A Seminar on Environment Aspect of Pesticide Production and use was held in Indonesia to allay undue fears of pesticides damages to environment and to bring out logical thinking and better understanding for promoting environmental safety in the manufacture and use of pesticides. Suggestion made regarding disposal of non-recoverable toxic wastes, etc.

4. Pesticide Residue

a) A Consultant on Pesticides Residue Analysis visited Bangladesh and provided training, suggested the need for instrumentation and manpower and creation of adequate facility to conduct residue analysis in Bangladesh.

b) Two Regional Workshops on Pesticides Residue Analysis was organised as a part of Pesticides Evaluation & Safety Testing (PEST) Programme of World Bank in co-operation with UNIDO/UNDP/FAO in Thailand in 1987 and 1989 with the basic aim to study new methods and procedures for monitoring the pesticides residue on food, human and animal tissues, soil and water. About 35 chemists participated from the region and directly benefitted by these programmes.

5. Quality Control

Two Workshops on Quality Control of Pesticides Formulation were organised in India as a part of PEST Programme of World Bank in cooperation with UNIDO/UNDP/FAO to upgrade the knowledge and skill in testing of pesticides and making new formulations and to create awareness among technicians about the potential hazard of various pesticides during chemical analysis and to undertake collaborative studies with international bodies like AOAC/CIPAC, etc. About 35 fellows for the RENPAP member countries were trained in the above two workshops.

Consultant on Quality Control was engaged for Thailand to provide training in Quality Control and specifications needed for the various pesticides and to provide guidelines to assess the quality of pesticides and their formulations.

Participation in CIPAC

Representatives from the RENPAP member countries, namely, Philippines, Pakistan, Srilanka, South Korea, China, India and Indonesia attended the two CIPAC meetings held in 1986 and 1989. It was proposed to give CIPAC award for a good collaborative study

or a well prepared presentation of report to express more clearly the CIPAC recognition of good work.

6. Use of local raw materials

i) Survey of local raw materials.

Study tours were undertaken by the officials from Govt. of India to Korea, Indonesia and Malaysia in October, 1988 and report submitted to UNIDO.

ii) Need of technology for utilisation of local raw materials.

The topics on needs for technology for the utilisation of local raw materials for formulation were covered in the Workshop on Pesticides Formulation Technology held in India and the participants were trained on the techniques and methodologies needed for selected local materials required in formulation.

iii) Packaging material for Pesticides

A Consultant from India visited Indonesia who drew up guidelines for use of local materials in packaging of pesticides.

7. Registration requirements

A Consultant from Newzealand was engaged for 3½ months who visited some selected member countries of the region to review and assist the individual country regarding the pesticides registration procedure and to assist in setting up registration schemes.

A Regional Expert Consultation was held in December, 1986 which was attended by 51 delegates representing 11 countries and associated UN agencies. Guidelines were issued for improvement of policies and regulation with effective enforcement of pesticides regulation in a harmonised way and to strengthen regulations, improve monitoring on quality control and residue, etc. The expert group recommended to promote in specific areas of good labelling practices for pesticides, guidelines for residue limits, development of protocols for low efficacy trials, etc. The expert group stressed to continue and implement FAO code of conduct for registration requirement.

8. Exchange of information

- i) Reports of Consultants and fellows submitted after accomplishment of missions are being sent to all member countries on regular basis.
- ii) RENPAP Gazette on Data collection system has been issued in October, 1988 and October, 1989 and sent to all member countries and other associated UN agencies.

1.3 Findings and recommendations

The project was evaluated by UNDP/UNIDO Evaluation Mission and the detailed recommendations are placed at Annexure I.

The Mission concluded that the project has been a success and based on their findings recommended that there is a need to continue the programme for another three years with a funding at a level higher than the current level of funding.

The Project Management Committee taking note of the recommendations made by the Evaluation Mission adopted the following resolutions :

- a) that the project should continue for another three years under a new phase.
- b) that it should concentrate on those areas which need consolidation and new areas which have not yet been covered during the first two phases.
- c) that the areas for consolidation are formulation technology and quality control and newer areas should cover occupational health and safety of workers, plant safety, environmental aspects, bio and botanical pesticides, data collection and dissemination.

1.4 Lessons learnt

The new innovative approach adopted in this network project has resulted in development of intimate technical cooperation between the participating countries for strengthening the pesticide industry through upgradation of knowledge and skill in the targetted areas. The linkages with the country programme, namely, the Pesticides Development Programme India with the Regional Network Programme has greatly benefitted the participating countries in upgrading knowledge and skill in the sphere of pesticides formulation technology and quality control. Pesticide

Development Programme India with the Regional Network Programme has greatly benefitted the participating countries in upgrading knowledge and skill in the sphere of pesticides formulation technology and quality control.

II INTRODUCTION

This report highlights the principal results of the Project as well as its finding and gives the justification for the project, the efforts made to attain the objectives, the activities undertaken and the achievement.

The Regional Pesticide Network is an unique set up in the area of Pesticides Development for the Asia Region and is almost 6 years old. All the activities except for short break of 8 months during 1986 have been very successful in bringing the network to a stage where the member countries can cooperate in various aspects related to the safe development, manufacture and usage of pesticides in the region. The project from its abnitio has gone through an evolutionary process covering areas of pesticides and other similar changes that have taken place in the developed world.

Emphasis is now being made on formulation technology, quality control, residue analysis, industrial, occupational and environmental safety and above all technical cooperation in the field of pesticide production, marketing and control among the member countries of the network.

During the 6 years of its existance two national laboratories have become the focal point to support some of its objectives. These are :

- i) Pesticides Development Programme India for formulation technology and Quality Control.
- ii) Laboratory of the division of Agricultural Toxic substances for Residue Analysis, Bangkok, Thailand.

Efforts are being made to create centres on effluent control and environmental safety and another on Industrial Safety in Pesticides manufacture and formulation by locating suitable countries who could offer to set up such laboratories to support the requisite activities of the Regional Pesticides Network.

Indepth evaluation of the project has been carried out by UNDP/UNIDO consultants and they have reported the benefits derived by member countries, shortcoming of the project and recommended remedial actions. They have also recommended continuation of the RENPAP. UNDP/UNIDO had approved six months extension of the project till June, 1989 in view of problems experienced and delay for non execution of activities during the shifting of the Regional Coordinating Unit from Philippines to India, in 1986.

2.1 Project Background

The Regional Network on Pesticides for Asia and the Pacific (RENPAP) under the project DP/RAS/85/023 is an inter-country project consisting of a Network of Participating National Institutes in the RENPAP with the India through the Hindustan Insecticides Limited (HIL) on behalf of Department of Chemicals & Petrochemicals, Ministry of Chemicals and Petrochemicals as the Regional Coordinating Unit.

It is a multi sectoral project executed by United Nations Development Programme in association with Food and Agricultural Organisation (FAO), Economic and Social Commission for Asia and the Pacific, ESCAP, World Health Organisation and World Bank. The project included Pesticide Evaluation and Safety Testing proposal of the World Bank under a sub-contract arrangement with the executing agency UNIDO.

The project during the phase - II was approved on 17th April 1986 with initial budget of US\$ 553,000 for 2 years and finally extended upto 30th June, 1989 with the revised budget of US\$ 848,644. Following countries are participating through their designated National Coordinating Units.

Afghanistan	Afghanistan Fertilizer Company
Bangladesh	Deptt.of Agricultural Extension.
China	Ministry of Agriculture
India.	Ministry of Industry, Deptt.of Chemicals & Petrochemicals, M/s Hindustan Insecticides Limited.
Indonesia	Agency for Industrial Research and Development.
South Korea	Agricultural Chemicals Research Institute,Office of Rural Development.
Pakistan	Pakistan Agri.Research Council.
Philippines	Fertilizer and Pesticides Authority.
Sri Lanka	Ministry of Agricultural and Research Development.
Thailand	Deptt.of Agriculture.

The project in principle is based on an innovative concept of UNDP supporting a regional, inter-governmental cooperative programme. The implementation of a project of this nature for the pesticides sector has been the first experience of the executing agency and the cooperating Govt. organisations involved under the guidance of the Executing Agency (UNIDO) and the Regional Network Coordinator, the work programme of the project has jointly been implemented by the National Network Coordinators.

FAO has participated as Associated Agency and has provided considerable back stopping on Harmonisation of pesticides registration requirement, on pesticides quality control and on pesticides residue and the World Bank contributed extensively to the Pesticides Evaluation and Safety Testing Programme under a sub-contract arranged with the executing agency UNIDO. The following programmes were sponsored by World Bank in collaboration with UNIDO/UNDP & FAO.

1) PEST Programme on Quality Control of Pesticides Formulation.

a) Oct./Nov., 1987 (5 W) at New Delhi.

b) Nov./Dec., 1988 (5 W) at New Delhi.

2) PEST Programme on Pesticides Residue Analysis, Bangkok, Thailand.

a) Nov./Dec., 1987 (5 W) at Bangkok.

b) Jan./Feb., 1989 (3 W) at Bangkok.

WHO contributed extensively to some of the technical aspects of the project, in particular to those dealing with toxicology and occupational health.

The institutional framework of the project consists of network of participating national institution of the region, with Hindustan Insecticides Ltd., of the Govt. of India assigned as the Regional Coordinator Unit. The National Coordinating Unit of the respective Govt. in the Project Management Committee assume responsibility for decision making, management and implementation of the project.

Assistance to the National Institutions participating in the project is rendered through experts to be exchanged among the member countries of the network and through external consultancy to be hired by the executing agency. UNIDO is responsible for the delivery of inputs such as expert services, equipments, fellowships and backstopping and the associated agencies provides necessary inputs particularly on areas of direct concern to them.

2.2 JUSTIFICATION OF THE PROJECT

Agriculture is the backbone of national economy of most of the countries of Asia and the Pacific. There has been a significant advancement in the development of pesticides during the last two decades and this has brought about a remarkable increase of agricultural output and a corresponding dependence on vital inputs materials namely fertilizers and pesticides. The requirement of the pesticides for public health and agricultural purposes is mostly met by the developing countries through imports

from the developed countries. Establishment of pesticides production and formulation industries in the developing countries are plagued by a number of factors like complexity of production technologies, lack of testing facilities and procedures for the evaluation of local raw materials, quality control in the factories, safety/hazard management in effective and nonregulatory practices, lack of basic technical information and data and effluent treatment and disposal.

The awareness of hazards connected with the ever growing use of pesticides has constantly increased. Further occupational health security and environmental protection measures have become an area of major concern not only to producers, traders and users of pesticides but also in general to the community outside the pesticides sector. To keep awareness among the society about the adverses of pesticide usage and to solve the inherent problems, expertise is needed to establish time schedule for phasing out the traditional products and replacing by those based on innovative technologies. It is also necessary to initiate effective control mechanism in all the countries of the region to strengthen the control of pesticides production and application so as to eliminate the adverse effects as far as possible.

Keeping in view the above issues, the participating countries supported the continuation of the RENPAP programme which aims at enhancing the development of the pesticides sector by strengthening technical cooperation among member countries specifically in the area of pesticides production, quality assurance, regulations marketing and control.

2.3 CONTRIBUTION

The Project RAS/85/85/023 was originally approved in April, 1986 for a period of 2 years at a cost of US\$ 5,53,000 with in kind contribution from the Govt. amounted to US\$ 8,94,740.

During the course of implementation of the project activities, the budget was revised (Project budget Code F to US\$ 6,95,644 and on July, 1988 Project Budget Code G to US\$ 8,48,644).

2.4 MONITORING AND EVALUATION REPORTS

2.4.1 The updated progress of implementation of the various activities as finalised in the work plan approved by the Project Management Committee at their 2nd meeting held in Nov./Dec.,1987 was submitted to UNDP/UNIDO as a Part of Project Performance Evaluation Report in 1988. Indepth evaluation of the various activities of the project was carried out by Dr.Mandava and Mr.Donnez, UNDP/UNIDO consultants and the recommendation/findings made by the consultants are given at Annexure I.

2.4.2 PMC MEETING

A report on the progress of the project implementation, the problems encountered and the proposed solution alongwith the recommendations/findings of the Evaluation Teams were discussed extensively during the 3rd PMC meeting held in Beijing,China in October,1988. The recommendations of the 3rd meeting are given at Annexure - II.

2.4.3 TPR MEETING

A Tripartite Review Meeting was held on 20th October,1988 in Beijing. This meeting was attended by National Coordinators from the member countries of the Network, representatives from UNDP/UNIDO and other UN Agencies including FAO, WHO, ESCAP and World Bank. The meeting was convened to review the progress of project implementation identifying problems and recommended solution. The salient points discussed are :

- i) Envisaged extension of the project.
- ii) Life of the Network beyond UNDP assistance.

The proceedings of the Tripartite Review meeting are given at Annexure - III.

Extension of the project as recommended by Evaluation Mission is fully justifiable for its sustainability beyond the life of the project and further UNDP support is necessary to enable the Network to stand on its own foot beyond the UNDP assistance.

III - THE PROJECT

Consequent upon India taking over the responsibility of Regional Coordinating Unit in April, 1987 following withdrawal by Govt. of Philippines, the implementation of the various activities as contained in the Workplan of the project document was delayed.

At the PMC meeting held in Nov./Dec., 1987 in New Delhi, India, the Workplan as contained in the project document under Phase II was revised and the activities were rescheduled so as to complete these by Dec., 1988 for achieving the desired output based on the objectives as laid down in the project within the stipulated period. The UNDP approved extension of the project for a period of six months upto 30th June, 1989 (Refer up-dated Workplan at Annexure IV). The project budget was revised in 1988 and rephased to reflect actual expenditure for the year 1987 and the consequential effect on the budget for future years. The revision allows for a six month extension of the project beyond Dec., 1988 only.

The change to the project budget is as follows UNDP Input

Previous UNDP input	-	
Project Code F		\$ 6,95,644
Revised UNDP input	-	\$ 8,48,644
Increase in UNDP input		\$ 1,53,000

3.1. DEVELOPMENT OBJECTIVES

Consolidation of achievements of the Regional Network on Pesticides for Asia and Pacific in order to expedite the development of the pesticide sector through strengthening the technical cooperation among the Network member countries of the Region specifically on issues relating to pesticide production and formulations, assurance of quality, to facilitate adoption of appropriate and most economical technologies for production in the region, and coordination of regulation, and control requirements relating to safe handling and application.

3.2. IMMEDIATE OBJECTIVES

3.2.1) To establish a regional information system for data on

3.2.1.a) Supply, production, marketing, distribution and use of pesticides and data of pests, crops and diseases.

3.2.1.b) Trials on pesticide residues in food crops and soils.

3.2.2) To provide guidance on research and development activities conducted in the member countries, concerning pesticide production and utilisation.

3.2.3) To encourage utilisation of local raw materials for the formulation of pesticides.

3.2.4) To harmonise pesticide registration requirements and control procedures to be observed by the member countries of the Network.

3.2.5) To promote understanding of toxic properties and effects of pesticides and to provide guidance on human safety precaution and environmental protection measures.

3.2.6) To advise on pesticide residue trials to be conducted in accordance with international standards and methods.

3.2.7) To formulate effective and uniform quality control standards for the region, based on collaboratively tested analytical methods and also to improve efficacy of pesticide materials manufactured and imported in Network Member countries and to establish current quality control resources and skills for pesticides analysis in these countries.

3.2.8) To continue the current exchange of information through publication of periodic bulletins by the Regional Network unit and mutual exchange or distribution of technical papers.

3.3. EXPECTED OUTPUTS

The following outputs at the end of project period of June, 1989 are expected :

3.3.1 Information system:

The operational scheme for regular collection of data on pesticide demand and supply, production, marketing, distribution and use in the region.

Data on residue trials conducted in some of the Network member countries, submitted in form of reports to the Joint meeting on Pesticide Residues for setting maximum limits of pesticide residues in selected commodities for the CODEX ALIMENTARIUS.

Annual reports on :

- a) Pesticide supply and production in Network Member countries.
- b) Basic pesticide registration data.
- c) Pesticide marketing, pricing, distribution and use.

3.3.2 R&D on Production

Report to Member Governments on ways to strengthen research and development facilities on Formulation Technology.

3.3.3 Local Raw materials

Survey of raw materials locally available in the member countries i.e. carriers, emulsifiers, surfactants, solvents, etc. for the formulation of pesticides.

Survey of the needs for technology for the utilisation of local materials for formulations.

Report of consultant containing recommendations on technology for the utilisation of local materials for packaging of pesticides.

3.3.4 Registration requirements

Improved national schemes for the registration and control of pesticides, including the adoption of Guidelines on Harmonisation of :

- a) Bioefficacy test protocol.
- b) Labelling, packaging, storage, transportation and safe disposal of pesticides,
- c) Evaluation of toxicity data,
- d) Residue trials.

3.3.5 Toxicology

Training on the toxic behaviour of pesticides, and on application of safety measures for humans and the environment.

3.3.6 Residue Trials

Procedures on standardisation of pesticides residue methodologies through workshops and individual fellowships.

3.3.7 Quality Control

Common procedures on standardisation of quality control through the use of collaboratively tested methods of analysis and training of participants in workshops on Quality Control of Pesticides Formulations and individual fellowship training.

3.3.8 Exchange of information

Regional documentation and information exchange service, providing the Network with :

- A) Biannual news letter on project activities,
- B) Technical bulletins on selected technical topics.
- C) Reports on Technical meetings.
- D) Reports of consultants and fellowship holders.
- E) Manual on Residue Analysis.

3.4. Description of inputs

3.4.1. UNDP Inputs

The project document provided for total UNDP inputs of (revised in 1988) US\$ 848,644 consisting of the following:

a) Experts - International Consultants as well as those from member countries limited to short-term assignments and selected on the basis of knowledge and experience	B-11	US\$ 182,000
b) Mission costs - covering estimated travel cost of UNDP, UNIDO and associated agencies participation in Network meetings.	B-16	US\$ 75,644
c) Regional Coordination Unit staff - consists of support extended to the Regional Coordination Unit for administrative, technical and professional staff.	B-20	US\$ 25,000
d) Training - including meetings, Workshops and seminars (organised to provide group trainings) and individual fellowship training and study tours, etc.	B-39	US\$ 500,000
e) Equipment	B-49	US\$ 38,000
f) Miscellaneous	B-59	US\$ 28,000
Project total	B-99	US\$ 848,644

3.4.2. Government inputs in kind

The participating governments contributed in kind in the form of existing resources and facilities of their national institutes. These were in the form of local counterpart experts, support staff, equipment, land, buildings and facilities etc. The total contribution of the member countries is estimated at US\$ 894,740.

3.5. Proposed activities

The project document contains the various activities (revised from time to time by PMC) to meet member countries requirements. The activities as contained in the updated workplan finalised by PMC in the meeting in Beijing, China, during October, 1988 have been achieved and is presented in Annexure IV.

3.6. **INSTITUTIONAL FRAMEWORK**

3.6.1 The Institutional framework as given in the project document consists of a Network of participating national institutions of the region with a regional nucleus coordinated by assigned staff of the Government hosting the Regional Coordination Unit. Each member country of the region nominates one of its existing national institutes to coordinate network activities locally.

The Project Management Committee is composed of the Regional and National Coordinators or experts holding senior positions in the National Institutes of the Network nominated by the Governments concerned. UNIDO, UNDP, ESCAP, FAO, WHO and World Bank are the ex-officio members and send their representatives at project expenses to participate in the deliberations of the PMC. The Project Management Committee is envisaged to meet once a year and review the progress, identify constraints in its implementation and prepare policy, work programme and recommend budget provision. The institutional framework of the Network and implementation procedures are also discussed to define the specific roles and responsibilities of Regional and National Coordinators and various UN agencies associated with the project.

IV. IMPLEMENTATION OF THE PROJECT

4.1 The activities of the Regional Network on Production, Marketing and Control of Pesticides in Asia and the Pacific under the Project RAS/82/006 which had been in operation since November, 1982 and ended on 31st December, 1984. The third TAC committee had strongly recommended that the project be extended for a phase II in order to continue some of the activities which need further consolidation and new areas which have not yet been covered. The Regional Network on Pesticides Project under Phase II (RAS/85/023) was approved in November 22, 1985 for two years and the project was approved by UNIDO/UNDP in April, 1986. The project activities were initiated with the convening of the first PMC meeting held in July, 1986. The activities and the accomplishment of the project were assessed against the workplan adopted by PMC and the project document. However, due to the withdrawal of Philippines as Regional Coordinator, there was discontinuation of hosting the Regional Coordinating Unit and the Project suffered a setback and was on the verge of disintegration. With India's taking over the role of Regional Coordinator in June, 1987 as per the sub-contract signed between UNIDO and the Regional Coordinator on behalf of Govt. of India and in spite of the delay of about one year in the implementation schedule due to the shifting of RCU from Philippines to India, it was possible to reinforce the commitment of the participating countries and the project activities progressed for achieving the goal of the project.

4.2 ESTABLISHMENT OF PRIORITY AREAS AND WORKPLAN

The progress of implementation of various activities as contained in the Workplan of the Project document (RAS/85/023) under Phase-II was reviewed by the Project Management Committee in the meeting held annually and the Workplan revised with regard to the priority areas identified for Regional cooperation. Mandatory budget revision was made by the UNDP/UNIDO. Training programmes, consultancy services and group meetings were planned in the following priority areas. Production, formulation and marketing

of pesticides, R&D in formulation technology assessment of local raw material for pesticides formulation, harmonisation of registration requirement, toxicology, quality control, pesticides residue analysis, data collection and information exchange, etc.

4.3. DESIGNATION OF REGIONAL AND NATIONAL COORDINATORS

Subsequent to the withdrawal by Govt.of Philippines to host the Regional Coordinator Unit, UNIDO approved taking over the role of RCU by Govt.of India with Dr.S.P.Dhua, Chairman & Managing Director, Hindustan Insecticides Limited as the Regional Coordinator of the Network from April,1987. During 1986, People's Republic of China as a non-member, participated at project cost in some of the activities. As a result of the benefits derived by them from such participation, the People's Republic of China approached UNIDO/UNDP for membership of the Network. UNIDO/UNDP accepted People's Republic of China as the tenth member of the Network. The following National Coordinators were designated by the respective Govts.

1) Afghanistan	Mr.Emaduddin Ghaiasi
2) Bangladesh	Mr.A.R.Khan.
3) People's Republic of China.	Ms.Zhang Chunzuan
4) Indonesia	Ms.Sri Amber Suryosunarko.
5) Philippines	Mr.Luis T-T-T-Villa Real
6) Pakistan	Mr.Umar Khan Baloch.
7) People's Republic of Korea.	Mr.Kyeong Hee-Lee
8) Sri Lanka	Mr.M.H.J.P.Fernando.
9) Thailand	Mr.Riksh Syamandanda (1988) Mr.Montri Rumakom.

4.4 REPHASING THE PROJECT ACTIVITIES BEYOND DECEMBER,1988

In the 3rd meeting of the PMC held in October,1988 held on 18-20 October,1988 at Beijing in China, the following two decisions were taken:

i) The project activities which could not be implemented due to the shifting of the Regional Coordination unit from Philippines to India should be completed by June, 1989 through a short extension of the project. The activities to be completed during this period would be as follows:

- 1) R&D Formulation Technology Workshop
March/April, 1989.
- 2) Expert Group meeting in 1989 on development of
Bio pesticides.
- 3) Individual training on safety aspects in pesticides
formulation and effluent control for 1 m/m.
- 4) Pesticide Data Collection meeting by UNIDO/ESCAP
- 5) Sub-Contract to RCU.
- 6) 1989, CIPAC meeting in Athens.
- 7) Expert Assistance to Pakistan in environmental
Toxicology.

ii) The PMC and the Tripartite Review meeting (Ann.II and III) recommended that the project be extended for a further phase extending over a period of three years.

4.5 PROJECT ACTIVITIES

The activities described below were undertaken during the duration of the project from May, 1982 to June, 1989 (Phase I and II) following workplans adopted by PMC in their meetings held from time to time. Implementation of the activities enabled attainment of the targetted outputs and objectives. The activities are discussed under the priority areas identified by the PMC.

4.5.1 Pesticide Data Collection systems

- a) Expert Group Meeting on Pesticide Data Collection System from May 18-22, 1987 at Pattaya, in Thailand.

The first Expert Group Meeting held in Thailand designed the methodology and workplan for data collection on the production and supply of pesticides in the region and it was decided to implement the schemes and collect base line data on production, supply and retail prices of selected pesticides. Five formats were designed to collect

the requisite information. The member countries were requested to furnish the data in the proper formats and submit the same to Regional Coordinator for compiling and dissemination of information. The second meeting on pesticides data collection systems organised in cooperation with ESCAP/ARSAP was held in Pattaya, Thailand from 18-22 May, 1987 in terms of the recommendations made by the PDC at its meeting held at Manila in July, 1986. This meeting was held with the following objectives :

- to review the current situation in member countries with respect to production, import, export and use data of pesticides;

- to discuss major difficulties in National Data Collection;

- to acquaint participants with the latest development in pesticides data collection and dissemination;

- to evaluate the past data collection and dissemination performance of the Network, identify the reasons for shortcomings and decide upon measures for improvement.

The meeting was attended by six delegates one each from the Republic of Korea, Indonesia, India, Thailand, Pakistan and Sri Lanka representing their respective Governments, two representatives of UNIDO, two from ESCAP and 23 observers from trade, industry, research organisations and the Thai Government Departments.

The Expert Group meeting on Pesticide Data Collection System noted that the data collection systems have, for the first time, functioned properly with the reporting of the relevant data in the prescribed RENPAP formats by the participant countries. Good interpretation and exchange of information between members would be extremely valuable for planning the usage of pesticides in the RENPAP countries. The Expert Group further felt that the collection system, which has got geared up to meet all requirements, must be strengthened and continued.

The expert group also felt that having established the data collection systems, the time has now come for refinement beyond the prescribed 5 formats, having priority to information on demand followed by more detailed analysis of pesticides use by crops and important pests.

The delegates were strongly of the view that RENPAP members not present at the meeting should be invited to cooperate in the completion, updating and analysis of data in line with the above plan.

As a follow up of the recommendations of the expert group meeting, data have been received in the prescribed format from India, Indonesia, Korea, Philippines, Thailand, Bangladesh and Sri Lanka. Data received from the member countries has been compiled, consolidated and summarized and has been published in the special issue of RENPAP Gazette. The copies of the Gazette have been circulated to member countries and the associated agencies.

As per the decision taken in the PMC meeting, Pesticides Data Collection in respect of those countries who have not responded properly would be undertaken by three group leaders from the member countries who would undertake visits to other member countries (seeking such assistance) to collect information on pesticides in the prescribed formats. The Group leaders have undertaken their visits and the achievements have been as follows.

1. The Group Leader from Thailand has completed his mission on data collection in China and Korea and submitted his report.

2. The Group Leader from Philippines has completed his mission in Sri Lanka and Indonesia and submitted his report.

3. The Group Leader from India has completed the mission on data collection in Pakistan and submitted his report.

Output :

1. Report of Data Collection from 1983 to 1986 has been published in a special issue of RENPAP Gazette in October, 1988.

2. Member countries have now been trained through Regional Consultant in Data collection systems to maintain the data in the designed formats.

4.5.2 Production and Formulation of Pesticides - Research and Development.

4.5.2.1 Individual Training/Study Tour:

One fellow from Afghanistan had undergone training in pesticides formulation technology at PDPI Centre (India) Jan., 1988.

4.5.2.2 Regional Workshop on Pesticide Formulation Technology

Hindustan Insecticides Limited, through its Pesticides Development Programme India organised two Regional Workshops on Pesticides Formulation Technology in cooperation with UNIDO/UNDP.

i) The basic purpose of holding these Regional Workshops was to highlight the advances made in the pesticides technology and the newer formulations that have become popular in the recent years which would be useful to the countries of the region.

The Workshops were intended to cover :

- Advances made in pesticide chemistry during the last two decades;
- Development in pesticides formulation technology;
- Survey and documentation of raw materials available in member countries;
- Promotion of use of locally available raw materials in pesticides formulation;

Contd...

- Control of quality of newly developed formulation and regional standardization;
- Encouraging development work in formulation of pesticides in developing countries to make use of locally available raw materials;
- Packaging materials and requirements;
- Safety aspects and effluent treatment in pesticides formulation.

Representatives from member countries of the region and candidates from Nepal and Tanzania also attended the above Workshops.

The Workshop consisted of technical and practical sessions dealing with pesticides, formulations technology, testing of adjuvants, quality control, etc.

4.5.2.3 Recommendations

These workshops focussed attention on the necessity of developing capabilities in the member countries to undertake safer formulations.

Realising the value of utilising local raw materials, the workshop recommended survey to be carried out to assess the availability and quality and encourage their utilisation within the region.

PDPI be designated as a Regional Centre for Technology transfer for Asia and Pacific and to serve as a data base.

- services of PDPI centre be available to the member countries in the areas of technical trouble shooting, formulation improvement, quality control and training aspects of pesticide formulation on mutually agreeable basis.

- use of services available at the PDPI Centre and Agricultural Chemical Research Institute in Korea for use by the member countries for evaluation of the locally available raw materials.

- adoption of the study undertaken by PDPI for specification development of surfactants and emulsifiers meeting the quality control requirements in pesticide formulation.

- PDPI/UNIDO to broaden their base to include provision of technical know-how on disposal of pesticides viz. by incineration in those countries where no such facilities exist such as Sri Lanka.

- FAO/GIFAP recommendation concerning time barred products in the countries of the region by disposal of these materials whenever possible in the normal way.

- RENPAP principle is extended to English speaking African countries like Tanzania, Zambia, Malwi, Zimbabwe, Ghana, Nigeria, Egypt, Sudan, Kenya, Uganda, Ethiopia and others in the light of their similar climatic and socio economic conditions.

- PDPI/UNIDO to investigate means by which technical assistance can be provided to these countries with no formulation plants.

- Encourage "hands on" practical training of small group to make the training more effective.

- Continuation of RENPAP for at least five more years in order to be fully effective.

Output

More than 35 fellows were trained in the above two workshops.

4.5.2.4 Consultant on Packaging and Handling

A consultant, engaged for one month on packaging and handling of pesticides completed his mission in Indonesia on 1987.

The consultant was assigned to provide technical assistance services in the field of packaging and handling of pesticides formulated products. He had detailed discussions with various Govt.officials regarding pesticides import, sales, distribution and use etc. The consultant also visited warehouses, retail outlets and manufacturers of packaging materials.

The consultant recommended :

- Adoption of guidelines for safe and proper use of pesticides including safety measures and treatment of poisoning cases;

- Formation of a Pesticide Packaging Committee for purpose of drawing detail specifications and standardisation of different packaging materials used for different pesticides in the country.

- Utilisation of containers made of plastic materials and aluminium for safe handling;

- Quality Control System to be improved to ensure that the formulators use specified packaging materials.

- Loose sale of pesticides be stopped.

4.5.2.5 Consultant on Pesticide Planning Including Product Diversification:

A consultant from UNIDO, Vienna was assigned to India for 15 days to :

- Review existing pesticide use and requirements in relation to different types of formulations used in the country;

- Identify need of the consumers for new pesticides and to suggest new suitable products to fulfil the needs.

- Suggest methodology for laboratory and field testing of new products/formulation and quality assistance methods in pesticide production;

- suggest new uses of conventional products for increasing their life cycle keeping in view stringent environmental rules enacted by the Government;

- Suggest marketing strategy in potential areas of pesticides consumption inside and outside the country;

- Suggest methods/steps required for safety operations free from the environmental impact on workers and surroundings.

The consultant after discussion with officials from various Govt. agencies and other officials in pesticides sector recommended :

- to facilitate introduction of new pesticides according to country requirement.

- review of registration clause 9(4) of the Insecticides Act to encourage registration of newer and more effective pesticides and their formulation.

- proprietary rights for any new patented pesticides for 3 to 8 years depending upon the nature of the pesticides or their formulations.

- formation of central committee at national level to decide licensing of new manufacturers/formulators nationwide based on existing plants.

- industry responsibility on safety of contract labourers engaged and are exposed to toxic pesticides during transportation, processing, packaging, etc.

- women of child bearing age should not be allowed to work in selected areas where highly toxic pesticides are handled.

- formulation of a long terms plan to reduce persistent use of an organochlorine pesticides and switching over to more active and environmentally safe pesticides.

- maintaining of high national standards and quality of products to encourage export.

- Govt to encourage and subsidize environmental safe pesticides such as bio rationals and in applications techniques to reduce overall tonnage of pesticides used.

4.5.2.6 STUDY TOUR

Pesticides manufacturing and formulation based on local raw materials:

Mr. Shyam Suri, Joint Secretary, Govt. of India undertook study tour in Korea, Indonesia and Malaysia from 16th October, 1988 to 1st November, 1988 to make an appraisal of the development efforts and management of pesticides industry in these countries and the state of self sufficiency achieved in manufacture of both technical pesticides and their formulations.

He had discussions with the authorities responsible for research and development and regulations of pesticides, representative bodies of pesticide industry and concerned Govt. officials in the countries visited. Following recommendations have been made by Mr. Suri in his report submitted to UNIDO:

1. A delegation from India should visit Korea to take advantage of the work done and study. The procedure and the impact of pesticide combination.

2. To encourage bilateral exchange of informations on development of formulation technologies between PDPI and Agro-chemicals Research Institute to learn from other experience and to avoid duplication of efforts and expenditure.
3. To study patent law in Korea for short time and long time impact on development of indigenous industry and introduction of newer pesticides in the country at reasonable price.
4. To assist Indonesia in Technology transfer for production of both technical and formulated pesticides as per their requirement and India to learn from the experience of Indonesia about the use of safer technologies for the production of Carbamate group of pesticides.
5. To assist Indonesia for setting up R&D facilities for mutually advantageous collaboration in pesticides formulation technology.
6. UNIDO may invite Govt. of Malaysia in joining the Regional Network on Pesticides.

4.5.3 QUALITY CONTROL OF PESTICIDE FORMULATION

4.5.3.1 Regional Workshop on Quality Control of Pesticides Formulation

Two workshops were held in Oct-Nov., 1987 and Nov.-Dec. 89 as a part of the Pesticide Evaluation and Safety Testing (PEST) Programme of the World Bank in collaboration with UNDP/UNIDO/FAO. These programmes were conducted to upgrade the knowledge and technique in the testing of technical and formulated pesticides. The objectives of these training programmes were to -

- enable trainees from Network Member countries to carry out comprehensive physical and chemical analysis of pesticide formulations to determine their adherence to defined product specifications;

- introduce trainees to a wide range of traditional and state-of-the-art analytical methods, some of which may be more practical and efficient than those with which they are familiar;

- increase the productivity and efficiency of pesticide laboratories in member countries by developing trainees capabilities to select, instal and maintain laboratory instruments in good working order;

- promote the harmonisation of pesticide product specifications in the region; and

- enable chemists in member network countries to participate more fully in the international collaborative development and testing of pesticide analytical methodology, through the collaborative international pesticides analytical country (CIPAC).

The delegates recommended the following

- To create awareness among laboratory technicians about the potential hazards of various pesticide chemicals in course of the chemical analysis.

- Work out a laboratory manual on Good Laboratory Practices after collecting information from various agencies viz. EPA.

- Undertake collaborative studies with international bodies like AOAC and CIPAC for method of testing of pesticides.

- Create awareness of quality control in pesticides formulation manufacture and transported and use.

Output:

About 35 fellows from the RENPAP member countries were trained in the above two workshops.

4.5.3.2 Consultant on Quality Control specification

Mr. Brian Crozier, Consultant on Quality Control specification was engaged to provide training to counterpart in Thailand on the Quality Control and Specifications needed for the various pesticides used and to provide guidance on the Good Laboratory Practice (GLP) and the international and national standards to be followed for assessing the quality of pesticides and their formulations. The recommendations made by Consultant are :

- i) Strengthening the registration procedures for pesticides.
- ii) Manufacturers to provide information on their production in line with FAO specifications.
- iii) Manufacturers to provide samples on application for registration.
- iv) Strengthen quality control of pesticides.
- v) Widen analytical capability by purchase of further equipment.

vi) Increase confidence among analysts through international collaborative exercises.

vii) Training in instrument servicing and computer use and programming.

4.5.3.3 Participation in the CIPAC meetings

As a follow up of the recommendations made by Expert Group meeting on Quality Control of Pesticides held in Bangladesh from May 13-17, 1984 agreeing strengthening of cooperation among member countries of the Network by working towards adoption of common standard specification and method of analysis by collaborative studies with CIPAC, collaborative trials designed to standardise methods of analysis started among the participating countries in an effort to arrive at standard procedure for quality control of pesticides. Participation in the project has stimulated interest in international activities aimed at standardisation of procedures such as CIPAC collaborative studies which the Network has supported. The existence of the Network and its potential as the only project of its type in the region of Asia and the Pacific has been recognised by international organisations such as CIPAC, AOAC, GIFAP and the UN agencies. CIPAC has become aware of the needs of the region and has taken positive step to consider the priorities. The member countries, namely, Philippines, Pakistan, India and Sri Lanka participated in the CIPAC meeting held in 1986.

Dr.Dhua, Regional Coordinator, RENPAP alongwith the representatives from Korea, Indonesia, China and Pakistan attended the 33rd Annual meeting of CIPAC held in Lagonissi, Greece on 19-22 June, 1989. Dr.Dhua presented a paper on the activities of the RENPAP alongwith the background and the objectives of RENPAP. Reports on collaboration study on method of testing of various pesticides (technical and their formulation) were discussed. It was proposed to establish a CIPAC award for a good collaboration study or a well prepared presentation of a report to express more clearly the CIPAC recognition of good work.

RENPAF Gazette on pesticide data collection was also displayed at the meeting. All the members appreciated the good work done by the member countries and desired to have a copy of the Gazette. Copies of the Gazette were sent to each of the members who attended the annual meeting of CIPAC at Greece.

4.5.4 Pesticide Residue Analysis:

4.5.4.1 Consultant on Pesticide Residue Analysis :

Mr.Naresh Chandra Attreya was engaged by UNIDO as Consultant on Pesticide Residue Analysis to provide services/training to counterpart in Bangladesh. The consultant provided training surveyed the needs for instrumentation, equipment, services and personnel to provide adequate facilities to conduct residue analysis in Bangladesh.

4.5.4.2 Training Programme on Pesticide Residue Analysis

The Regional Workshops on Pesticide Residue Analysis were hosted by the Govt.of Thailand during Nov/Dec.,1987 and Jan/Feb.,1989 in Bangkok as a part of the PEST Programme of World Bank in cooperation with UNIDO/UNDP/FAO. Delegates from the member countries including delegates from various institutes in Thailand attended the workshops.

The main theme of these workshops was to give chemists from the region, the opportunity to review and upgrade their skills and learn new methods and procedures for testing of pesticide residue on food, human and animal tissues, soil and water. These workshops consisted of formal lectures in principles and general techniques for analysis of pesticides followed by laboratory exercises for analysis of residues in vegetables. The basic objectives for organising these workshops were to -

- Enable trainees from Network Member countries to conduct residue analysis of the most commonly used pesticides in the region.

- Introduce trainees to a variety of traditional and state-of-the-art analytical methods which may be more practical and efficient than those with which they are familiar.

- Increase the reliability and utility of trainees analytical work by emphasising statistical aspects of sample collection and data analysis and reporting.

- Increase the productivity and efficiency of pesticide laboratories in Network Member countries by developing trainees capabilities to instal and maintain laboratory instruments in good working order.

- Promote the harmonisation of pesticide analytical methods in the region; and

- Enable Network Member countries to participate more fully in international aspects of pesticide regulation, by supplying residue data for the work of the Joint FAO/WHO meeting on Pesticide Residues in food and the environment.

- Give more laboratory and hands on training and greater exposure to instrument maintenance, immuno assay, analysis of new pesticides and analysis of foods and soil.

- Give greater emphasis of GLP, MRL, ADI, SOP, etc.

Output:

About 35 fellows from the RENPAP member countries were trained in the above two workshops.

4.5.5 Harmonisation of the Pesticides Registration requirements

4.5.5.1 Consultancy Services

An international consultant from New Zealand was engaged for three months to provide consultancy services to member countries of the region to appraise the individual country on the status of pesticide registration procedure and to assist in setting up of a pesticide registration scheme suiting the individual countries. The experts also identified the similarities and differences in the legislation, registration and data requirements among the member countries and identified areas of harmonisation. The expert recommended:

- adoption of FAO & WHO guidelines on data requirements and the proposed registration schemes;

- revision of guidelines on bio-efficacy trials and on labelling for use in the region.

4.5.5.2 Regional Consultation on Harmonisation of Pesticides - Registration Meetings held in December, 1986 in Philippines

The expert group meeting held in December, 1986 was organised in regard to the implementation of one of the activities under the work programme approved by the PMC of the Regional Network on Pesticides and had the following objectives :

- to review the progress made in the implementation of the harmonisation registration requirements in line with the recommendations of the October, 1983 meeting.

- to agree on efficacy test protocol both as to the format and the test required for the most important pest/crops in the region.

- to consider various FAO guidelines on :

- efficacy data on registration of pesticides for plant protection, crops residue data, environmental criteria for registration of pesticides, registration and control of pesticides, good labelling practice, packing and storage of pesticides, disposal of waste pesticides and pesticides containers on the farms.

- to consider the subject of proprietary rights to registration data and to explore ways of implementing these products.

- to note the code of conduct on distribution and use of pesticides adopted by FAO member countries and to discuss ways to implement the various articles and provisions of the code.

- to review the proposed scheme for information, exchange on registration status of pesticides among participating countries.

The meeting was attended by 51 delegates representing 11 countries and organisations like FAO, WHO, ADB, South Pacific Regional Environmental Programme (SPREP), GTZ, GIFAP, the commonwealth Agricultural Bureau (CAB) and South Pacific Commission (SPC). The expert group stressed on:

- The improvement of policies and regulations with effective enforcement of pesticide regulation in a harmonised way and to strengthen enforcement of regulations, improve monitoring on quality control and residue, pesticides usages and applicators health in training in safe and efficient use of pesticides and recommended to promote in specific areas like ;

- Good labelling practices for pesticides; adoption of colour coding while labelling containers containing pesticides based on hazard of pesticides chemicals and continuing of harmonisation process in all respects particularly with regard to labelling within territories in so far as their laws permit or can be amended.

- Guidelines on Residue Trials to provide data for the registration of pesticides and establishment of Maximum Residue levels on plants and plant products and with food of animal origin to improve and harmonise the procedures for obtaining residue data and introducing maximum residue limits of pesticides in food.

- The development of agreed protocol for bio-efficacy trials among countries with similar climatic and pesticide conditions.

- Adoption of harmonised preharvest intervals after pesticide application on crops.

Member countries agreed that they should continue and intensify to implement FAO code of conduct in all respects in association with National Pesticide Association and efforts be made to make countries who do not follow the code should comply to the FAO code of conduct through incorporation into national legislation by reference.

The member countries group accepted the concept of harmonisation of registration requirements and agreement in principle to adopt as far as practicable the recommended FAO and WHO procedure and guidelines on registration data requirement and procedure.

4.5.6 Toxicology

4.5.6.1 Regional Forum on Pesticide Toxicology April 22-26, 1985 in Philippines

The meeting was held to consider a basis for Regional Harmonisation of Pesticide Toxicological requirements, examine elements of toxicological assessment and implication for regulatory control of the need for appropriate safety measures in the use of pesticides. There were lectures

by experts followed by group discussions on use of toxicological data for registration, classification of pesticide, mode of action, acute sub acute and long term toxicity studies, studies on human exposure and education in safe use of pesticides. The Expert group recommended the need for training on toxicology assessment, study on manpower needed for toxicological assessment and that exchanges between staff of regulatory authorities in the Network and their counterpart in developed countries shall be encouraged as a means of sharing practical experience on pesticide registration. The forum also stressed the need to harmonise labelling practices in the region.

4.5.6.2 Dr. Alan Calderbank was fielded to Pakistan by UNDP/UNIDO as consultant in Environmental Toxicology during June/July, 1988. The consultant recommended for establishment of Exo-toxicology centre in Pakistan. Govt. of Pakistan is actively scrutinising the offer for the centre under collaborative programme.

4.5.6.3 Consultant on Occupational Health Assessment.

Mr. Keith T. Maddy, Staff Technologist and Pesticides Health and Safety Adviser, Deptt. of Food & Agriculture, California, USA was appointed consultant by UNIDO on Occupational Health Assessment to render services to counterpart in Philippines during April 9-27, 1989. The consultant has made the following recommendations:

- i) Increase in operational budget of FPA.
- ii) Citation system of assessing fines for pesticides use to be implemented with the collected fines being used by FPA.
- iii) Enforcement of audit system for adequate impact occupational safety as well as consumer, public and environmental aspect of the regulatory system.
- iv) To collect data on pesticide illness/death information from all possible sources upon which an occupational and public health safety programmes should be based.
- v) Upgrading laboratory capabilities and a long series of exposure study be conducted on the work conditions and practical usages situation specific to Philippines to measure the first exposure situation and to conduct acceptable biological monitoring tests such as cholinesterase.

vi) Physician should be aware about the various characteristics of cholinesterase as inhibitor compound as well as non-cholinesterase inhibitors for treatment of the persons exposed.

vii) Implementation of the occupational health recommendations already available in the guide and to continue the occupational health programme under the broad mandate in promoting safety responsibility.

viii) Blood bromines study on applicators working with methylbromide and also to conduct comparative study on workers exposed to carbamate as well as organophosphorous pesticides.

ix) Possibility of avoiding reentry hazards from the toxic effect of pesticide chemical through judicious application to foliage.

x) Most of the toxic and restricted chemicals be made safe through reformulation into more ditute concentration. Workers exposure studies should be conducted on applicators using such products.

xi) No toxic products should be permitted to be handled without an entire new structure and a real functional occupational health programme. All shortcomings in the operation units be brought to acceptable occupational health standards. Regular inspection (half yearly) be conducted to assure compliance.

xii) Plants should be well equipped to handle most fires to avoid major occupational and public health hazard.

xiii) Salvage of returned unused pesticides needs further investigation.

xiv) Casual workers are difficult to provide training and occupational health services because of their transient nature. If these institutional users wish to continue usage restricted pesticides, then :

- 1) New warehousing procedures should be implemented,
- 2) Waste disposal improved,
- 3) Incineration procedures improved;
- 4) New locker rooms, toilets and showers provided;
- 5) A new laundry facility constructed;
- 6) And health status of laundry workers studies.

4.5.6.4 Training on Environmental Impact Assessment

Mr. Ricardo T. Deang and Mr. Francis C. Neri underwent training on Environmental Impact Assessment in Australia for a period of two weeks.

4.5.6.5. Environmental aspects of Pesticide Production and use

The use of pesticides are still needed to man in order to increase food production and improve public health standard and for longevity. With due care in the production and use of pesticides, the detrimental effects of pesticides to the environment and to human health could be reduced considerably. The negative impact of pesticides industry can be avoided or at least minimised by proper selection of process technology from the first stage of Industrial Planning and Safety practices during their production. The basic purpose of holding the seminar on environmental aspects of pesticides production and use was to allay the undue fears of pesticides damages to the environment and bring out logical thinking, better understanding, to promote environmental safety in the manufacture and use of pesticides. Govt. of Indonesia hosted the seminar entitled "Environmental aspect of Pesticide Production & Use" in cooperation with UNIDO from 28th Nov to 2nd December, 1988. The basic objectives of the seminar were :

i) To have a regional forum to discuss the status of the pesticides industry, the Govt. rules and regulations regarding control of effluents in production of pesticides and monitoring procedures during production and use of pesticides.

ii) To discuss methods used in developed countries, effectiveness of these methods and how they could be applied to the region.

iii) To promote improved flow of information among producers, traders, Government and the users and use of documents such as :

a) International Register of Potentially Toxic Chemicals (IRPRC) developed by UNDP.

b) Hazardous Waste Management - Guidelines for Govt./Industry (UNIDO).

c) FAO code of Conduct on distribution and use of pesticides.

- d) Safe use of pesticides in public health (WHO)
- e) Effluent limitations guidelines for pesticide chemical manufacturing, EPA.
- iv) To adopt measures on regional and national basis to understand and promote awareness and responsibilities of industries public and the Govt. in environmental aspects of pesticide production and use.
- v) To enable participants from member countries to make recommendations to their governments to improve the existing conditions in the region.
- vi) To identify specific areas of inter country cooperation in the field which would encourage, facilitate and strengthen measures to reduce adverse effects on environment due to production and use of pesticides.
- vii) The seminar was attended by delegates of the member countries each from Afghanistan, Peoples Republic of China, Indonesia, India, Pakistan, Thailand, Srilanka, Republic of Korea and representative from UNIDO ESCAP/ARSAP/CIRAD/GTZ.

Most of the countries have the set-up of a management system but do not seem to have the mechanism for implementation of monitoring procedures. Delegates expressed their interest in the harmonisation of the requirements for environmental control involving pesticides in line with OECD and similar international organisations. Such a regional project would lead to a better exchange of information among the countries of the region in a more effective and efficient way in controlling pollution from gases, liquid and solids, waste emissions from production and use of pesticides.

The meeting also discussed the importance of alternate strategy of overall reduction of pesticides consumption covering non-toxic agent, formulation and application technology.

The recommendations made by the delegates are as under:

- a) To have a survey of all pesticide producers on a country basis, type of compounds produced, the size of operation limit of operation, limit of effluent generated methods adopted for treatment of effluent and waste disposal.

- b) UNIDO should get guideline for effluent limitation based on Best Practical Technology (BPT) currently available.
- c) Any producers identified by the survey who do not have the facility, however, small they are, should be persuaded and assisted to instal this equipment.
- d) Guideline advice be given on methods of waste reduction and reuse. Disposal of non-recoverable toxic wastes is often difficult. Some producers may have excess capacity (i.e. incineration) and sharing of those facilities should be encouraged possibly with the assistance through Govt. subsidy.
- e) Govt. of the region should provide incentive to import good quality carbon until such time similar quality materials are available within the region through local production.
- f) An exchange of information within the region should be established as a means of sharing practical experience in environmental aspects of pesticide production and use.
- g) Training and expert advisory service should be provided on national and regional basis to promote inter-country cooperation in these areas.
- h) Indonesia to act as technical coordinator within the framework of RENPAP on the environmental aspects of pesticides production and use.
- i) Wherever possible standards operated by OECD be adopted in the region to avoid disruption in the international trade.

UNDP/UNIDO should assist the establishment of Centres for Coordination, monitoring of effluent quality implementation in soil, air, aquatic and wildlife environment.

ANNEXURE I

RECOMMENDATIONS OF THE UNDP/UNIDO EVALUATION MISSION

RECOMMENDATIONS

1. Regarding activities, the Evaluation Mission recommends that the Network:

a) Offer indepth training courses in toxicology, environmental and residue chemistry and quality control methodologies.

b) Promote the image of RENPAP by publishing newsletters.

c) Bring awareness on environmental concerns, health and safety issues as a result of pesticide use,

d) Encourage greater participation of industry/pesticide associations in RENPAP activities.

2. To strengthen the structure and functions, the Evaluation Mission recommends that RENPAP :

a) Provide a formal framework to the organisation and its executing body (Project Management Committee).

b) Introduce a concept of rotation for regional coordinator after certain period,

c) Maintain a permanent RCU Unit,

d) Strengthen its functions by appointing a full time person (e.g. executive Secretary) with adequate equipment and budget (travel and communications) for operation of RCU.

e) Strengthen its structure by nominating technical coordinators to plan and coordinate the activities in specified technical arena.

3. To properly evaluate the progress (or performance) of each task (program/activity) in the immediate objectives, the Evaluation Mission recommends that the Network:

a) Clearly identify all the tasks for each objective and introduce a measuring device for quantification of the results achieved from the training programmes/workshops/study tours.

b) Set milestones and deadlines for the activities/projects undertaken by RENPAP.

c) Define objective and tasks (planned activities) very clearly.

4. Because of the availability of consultants and experts in the region and also because of the cost savings to RENPAP by using the regional expertise, the Evaluation Mission recommends that RENPAP :

a) Maintain a roster of available consultants and experts in the network countries for each specialised subjects/areas.

b) Maintain a Directory of laboratories and other evaluation units (public and private) engaged in pesticides. These source lists will be useful for selecting experts for RENPAP activities.

5. To increase effective participation of the member countries in all activities of RENPAP, the Evaluation Mission recommends that the Network :

a) Publish a newsletter on RENPAP activities and progress in the implemented plans, and also general information on pesticides.

b) Publish a RENPAP Gazette to provide information on pesticide data collection.

f) Find a mechanism to speed up the communication from the executing agency to the network regional coordination unit and the national coordination units.

6. Based on findings, the progress made during the 6-year period, the immediate needs, realising the need to continue the program for another three year period and also taking into consideration of sustainability of the project, the Evaluation Mission strongly recommends that UNDP provide funding for continuation of the RENPAP project for another three year period (Phase III) at a level higher than the current level of funding.

The Evaluation Mission, while making the above recommendation suggests that UNDP and UNIDO consider incorporating the following points (elements) in Phase III project document.

a) Gradual phase out of the funding for planned activities and programs for Phase III.

b) Encourage the participating country governments to make financial commitments for some activities through TCDC.

c) Ensure the industry participation in the planned activities for Phase III. This is considered important in view of the stated developmental objectives of the RENPAP project.

ANNEXURE II

**RECOMMENDATIONS OF THE THIRD PROJECT MANAGEMENT
COMMITTEE MEETING IN BEIJING, PEOPLES REPUBLIC OF CHINA**

1. Having considered that the benefits and impact of the RENPAP projects under DP/RAS/82/006 & DP/RAS/85/023 to the member countries of the region in the area of pesticides, the Project Management Committee (PMC) strongly recommends:

a) that the project should continue for another three years under a new phase;

b) that it should concentrate on those areas which need further consolidation and new areas which have not yet been covered during the last two phases;

c) that the areas for consolidation are formulation technology and quality control and new areas should cover occupational health and safety of workers, plant safety, environmental aspects, bio-and botanical pesticides, data collection and dissemination.

2. Having considered that the experience already gained and expertise created in different aspects of pesticides, the PMC recommends

a) that a roster of regional experts should be created in different areas relating to pesticides;

b) that a greater number of regional experts from the roster should be used in the new phase.

3. Having considered that the Regional Coordinator Unit has been well established in the last two phases, the PMC recommends

a) that the new phase will contain very little institution building element but only needed support be given in maintaining office facilities;

b) that the project should support a RENPAP Secretariat within the framework of the Regional Coordinator Unit.

4. Having considered that the new FAO project funded by the Japan will cover only the FAO code of conduct in pesticide distribution and use, the PMC recommends -

a) that RENPAP should put emphasis on aspects related to pesticide production and both RENPAP and FAO Japanese funded project should avoid overlapping of areas, coordinate their activities and allow provision for RENPAP Secretariat to nominate persons to participate in FAO meeting and FAO in turn will participate in RENPAP PMC meetings.

5. Having considered the importance of the forthcoming Regional Seminar entitled 'Environmental Aspects of Pesticide Production and Use' in Jakarta, Nov 28-Dec.2,1988, the PMC recommends

a) that the resolutions passed by the seminar and the actions to be taken for follow up should be incorporated into the project document for the 3rd phase.

6. Having considered the importance of all associated agencies' contribution to the project in the last phase, the PMC recommends

a) that their continued cooperation should be solicited in the next phase and their activities e.g. WHO Asia Regional Programme on Toxicology of Chemicals, should compliment RENPAP project activities.

7. Having considered in detail the UNDP/UNIDO evaluation report and also emphasis placed on Technical Coordination and information collection and dissemination, the PMC recommends -

a) that Technical Coordinator units be established in areas such as Formulation Technology-India, specifications and impurities in active ingredients at manufacture level - Korea, Environmental Aspects related to PesticidesIndonesia, Use of bio and botanical pesticides - Thailand; Pesticides Mixture Formulations (India/Korea).

b) that Pakistan to give later its area of preference for technical coordination.

8. Having recognised the benefits and impact of the RENPAP project and the incremental contribution in cash and kind by the member countries in the first two phases, the PMC recommends -

a) that in the next phase the cash and kind contribution should proportionately increase and the estimated amount should be clearly specified in the project document.

ANNEXURE III

TRIPARTITE REVIEW MEETING RAS/85/023
REGIONAL NETWORK ON PESTICIDES IN ASIA AND THE PACIFIC

The Tripartite Review Meeting was held on 20 October, 1988 in Beijing. The meeting was attended by the national coordinators from the following member countries of the Network: China, India, Indonesia, Republic of Korea, Pakistan, the Philippines, Sri Lanka and Thailand; the Regional Coordinator; the representative of UNDP; the representatives of UNIDO (executing agency) and other UN agencies including FAO, WHO, ESCAP and World Bank. The list of participants is attached. Before the TPR, the Third Meeting of Project Management Committee (PMC) had been held 18-19 October, 1988. The report of the PMC meeting covering detailed proceedings was prepared and was to be submitted by UNIDO separately.

Mr. Morey, Resident Representative in China opened the meeting on behalf of the Principal Project representative (PPR) and mentioned his association with the project during the early days of its inception and was aware of the extent to which the associated agencies cooperated with the project providing expertise to the network in the areas of data collection (ESCAP), code of conduct in the use of pesticides (FAO), harmonisation and toxicology (WHO) and group training (World Bank). This collaboration of agencies is the natural expectation of the UN system therefore he was pleased with this combined effort.

At Mr. Morey's suggestion, the meeting adopted the following agenda:

1. Introductory remarks
2. Summary of the Two Day proceedings of the PMC meeting.
3. Discussion on the summary.
4. Future activities :
 - A. Envisaged extension of the project.
 - B. Life of the Network beyond UNDP assistance.

Mr. Morey indicated that an extension of the project as recommended by the Evaluation Mission should be fully justified with regard to its sustainability beyond the life of the project; its complementarity and compatibility with national and other regional projects and the degree of interest by the member countries as indicated by the use of their own resources.

The regional coordinator summed up the proceedings of the previous two day discussions and expressed his gratitude for the excellent support given by the agencies.

He specially highlighted the contribution made by countries like India, Thailand, Philippines, Korea and Indonesia. He emphasised the TCDC concept already followed by the Network with countries like India, Indonesia, Pakistan providing experts within the region and he also provided figures to show that the amount of cash and kind contribution by the member countries compared to UNDP contribution in US dollars

	UNDP	Member countries	
Phase I	500,000	496,000	(1:1)
Phase II	628,000	894,000	(1:1.4)

showing an increased level of contribution from Phase I to phase II.

He also mentioned that the Meeting discussed countries needs extensively and that further UNDP support was necessary to enable the Network to stand on its own feet beyond the UNDP's assistance.

During the discussion, the participant from India explained the necessity to change the emphasis in the project in the 3rd phase to focus more on production, safety, quality, effluent problem, waste disposal, occupational hazards at the production end. This re-orientation of emphasis was necessary due to the recent Japanese funded FAO project designed to focus on agriculture and the implementation of the FAO code of conduct on the use of pesticides. Areas dropped out by the project such as residue analysis, harmonisation of registration safety aspects at the user end would be covered by the new Japanese funded FAO project. At the same time close coordination would be kept with a representative from RENPAP participating in relevant meetings of FAO project and vice versa. Mr. Morey pointed out that the understanding on complementarity and compatibility between the two projects as agreed by the Meeting should be clearly conveyed to UNDP Headquarters. In this connection, he also mentioned maintaining coordination with the UNDP/WHO Project on chemical safety, with regional headquarters in New Delhi.

All the associated agencies, FAO, WHO, World Bank and ESCAP stressed the importance of the project to the region and their willingness to provide their expertise to RENPAP during the 3rd phase.

Mr. Morey said that the meeting revealed a clear consensus among the participants that the project should be extended and provided a check list of issues which should be addressed during the preparation of project document of phase III.

- compatibility/complementarity with other country and ICP projects.

- degree of interest of Governments, how they utilise their own resources.

- why the new extension is needed.
- emphasis on reorientation of the project in view of the coordination with Japanese funded FAO project.
- why more work under the network is still required.

Mr.Dhua indicated that most of the points raised in the check list had been considered by the PMC meeting and will be taken into account during the preparation of the project document for extension.

Mr.Morey thanked the participants for their contributions and concluded the meeting.

UPDATED WORK PLAN TILL JUNE, 1989

CONSULTANCY

<u>Consultancy Group</u>	<u>Need Subject</u>	<u>Duration</u>	<u>Proposed Date</u>	<u>Priority</u>	<u>Country that can provide</u>	<u>Remarks</u>
1.	2.	3.	4.	5.	6.	7.
All countries	Pesticide Data Collection	2 weeks	May, 1987	1	Thailand	Completed
	Harmonisation of Registration	1.5 m/m	Dec., 1986	1	Philippines	Completed
	Quality Control(PEST)	1 m/m	June, 1986	1	USA	Completed
	Residues(PEST)	1 m/m	June, 1986	1	USA	Completed
	Pesticide Data Collection in 3 groups	1 m/m	Oct./Nov., 1988	1	Thailand, Philippines, India	Completed
	Environmental Aspects on pesticide production & use	1 m/m	28 Nov.- 2nd Dec. 1988	1	Indonesia	Completed
	Formulation Technology	1 m/m	March/April, 1989	1	India	Completed
	Development of Bio-Pesticides and Botanical Pesticides	1 m/m	-	1	Europe/Regional USA	To be completed in Thailand.

1.	2.	3.	4.	5.	6.	7.
<u>Individual</u>						
Afghanistan	Handling/Packaging	1 m/m	Dec., 1988	1	India	Job description received and expert identified.
	Instrumentation	1 m/m	1989	1	India	Awaiting CV of candidate from India.
Bangladesh	Residue Analysis	1 m/m	Oct., 1986	1	UK	Completed
Indonesia	Packaging	1 m/m	Jan., 1988	1	India	Completed
India	Pesticide Planning including product diversification	.5 m/m	July, 1988	1	Austria	Completed
Korea	Herbicide Efficacy	1 m/m	July, 1988	1	India	Completed
Philippines	Occupational Health Assessment	.5 m/m	Oct., 1988	1	USA/UK	Completed
Pakistan	Environmental Toxicology	1 m/m	Early, 1988	1	UK	Completed
	Environmental Toxicology	1 m/m	Early, 1989	1	UK	Return Mission

T R A I N I N G

GROUP ACTIVITIES

Sl.No.	Subject	Type of Assistance	No. of participants	Proposed Date	Period & Duration	Proposed Venue	Priority	Remarks
1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	R&B Formulation	Training	10	Feb.,87	3 weeks	India	1	Completed
2.	Data Collection	Expert Training	10	May,1987	1 week	Thailand	1	Completed
3.	Harmonization of Registration	Expert Consultation	15	Dec.,1986	1 week	Philippines	1	Completed
4.	P.M.C.	-	10	July,1986	3 weeks	Philippines	1	Completed
5.	Environmental aspects of production and use of pesticides	Seminar	10	Nov.,1988	1 week	Indonesia	1	Completed
6.	P.M.C.	-	10	Feb.,1987	3 days	India	1	Completed
7.	Quality Control (FEST)	Training	12	Oct./Nov., 1987	6 weeks	India	1	Completed
8.	Residue(FEST)	Training	12	Nov.,1987	6 weeks	Thailand	1	Completed
9.	Quality Control (FEST)	Training	12	Nov.,1988	5 weeks	India	1	Completed
10.	Residue(FEST)	Training	12	Jan.-Feb. 1989	5 weeks	Thailand	1	Completed
11.	P.M.C.	Training	10	Oct.,1988	3 days	China	1	Completed
12.	Formulation Technology	Training	15	March, March,89	3 weeks	India	1	Completed
13.	Development of Botanical & Bio-Insecticides	Expert group meeting	10	1990	4 days	Thailand	1	To be completed.

Individual

1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	Indonesia	*Environmental Toxicology	Training	1st/2nd Qr.1988	5 m/m	Japan	-	Completed
2.		Effluent Treatment	Study Tour	April,1988	5 m/m	Germany/ USA/UK/ Belgium	-	Completed
2.	India	Pesticide manufacturing and formulation based on local raw material	Study Tour	Oct.,1988	2 weeks	Within the region	-	Completed
		Instrumentation analysis	Training	June,1986	2 weeks	Austria	-	Completed
3.	Bangladesh	Biological Screening	Training	Mid,1988	1 m/m	Philippines	-	Placement in progress
		* Environmental Toxicology.	Training	End of 1988	1 m/m	Europe	-	Placement in progress
4.	Korea	R&D Formulation	Study Tour	Mid.1988	1 m/m	USA/Europe	-	Completed
		* Environmental Toxicology	Training	Nov.,1987	1 m/m	USA	-	Completed
5.	Sri Lanka	Analytical Methods	Trining	June,1986	2 weeks	Austria	-	Completed
		* Environmental Toxicology	Training	End of 88	1 m/m	Europe	-	Placement in progress

1.	2.	3.	4.	5.	6.	7.	8.	9.
6.	Thailand	* Environmental Toxicology	Study Tour	End of 88	1 m/m	Europe	-	Placement in progress
		Instrumental Analysis (Formulations)	Training	End of 88	1 m/m	UK	-	To be completed
7.	Pakistan	Analytical Method (Formulations)	Training	June, 1986	2 weeks	Austria	-	Completed
		* Environmental Toxicology	Study Tour	End of 88	1 m/m	Europe	-	Placement in progress
8.	Philippines	Environmental Impact Assessment	Training	End of 88 or Early, 1989	2 m/m	Australia	-	Completed
9.	Afghanistan	Formulation Technology	Training	June, 1988	1 m/m	India	-	Completed
10.		* Environmental Toxicology	Training	End of 88	1 m/m	Europe	-	Completed
10.	China	Biological Screening	Training	End of 88	1 m/m	UK	-	Completed
		* Environmental Toxicology	Training	End of 88	1 m/m	Europe	-	Completed
11.	Thailand, China, Bangladesh, Korea, Indonesia.	Analytical Method	Study Tour	April/ May, 89	10 days each	Greek	-	Completed

1.	2.	3.	4.	5.	6.	7.	8.	9.
12.	China	Data Collection	Study Tour	Early, 1989	1 m/m	India	-	Completed
13.	It was decided to provide 10% of the total m/m for meeting priority requirements determined by the the Regional Coordinator Unit.							

* Environmental Toxicology Training Programmes of different countries may be grouped together. Time and Venue to be determined depending upon the availability of a place and the Project Management Office to look into this aspect.