

**WORLD HEALTH ORGANIZATION  
WESTERN PACIFIC REGIONAL CENTRE  
FOR THE PROMOTION OF  
ENVIRONMENTAL PLANNING AND  
APPLIED STUDIES**

**(PEPAS)**



**SUMMARY OF 1991 ACTIVITIES**

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Western Pacific Regional Centre for the Promotion of  
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(PEPAS)

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## **1. INTRODUCTION**

Established in 1979, the WHO Western Pacific Regional Centre for the Promotion of Environmental Planning and Applied Studies (PEPAS) is the technical arm of the WHO Regional Office for the Western Pacific, responsible for promoting and facilitating effective collaboration among Member States and supporting the development of self-reliant institutions and capabilities in the field of environmental health. The Centre implements activities in the five principal programme areas related to the promotion of environmental health, namely: community water supply and sanitation; environmental health in rural and urban development and housing; health risk assessment of potentially toxic chemicals; control of environmental health hazards; and food safety. It collaborates with Member States in conducting national and regional training courses and workshops to develop and train environmental health human resources, and it provides technical cooperation services to promote the development of national environmental health policies and planning capabilities in Member States. It also serves as an environmental health information service centre and facilitates information exchange and cooperation among national institutions and WHO collaborating centres in environmental health in the Region. The collaborating centres are part of an international network designed to perform activities in support of WHO's environmental health programmes.

## **2. PEPAS STAFF**

Annex 1 lists the staff of the Centre during 1991. Four posts were vacant during most of the year but two of these were filled in October.

## **3. HIGHLIGHTS OF ACTIVITIES UNDERTAKEN**

In 1991, PEPAS collaborated with national agencies, research/training institutions and local governments in 17 countries and areas of the Western Pacific Region on various environmental health activities. Altogether, 37 collaborative activities were implemented by staff members and/or consultants, and the Centre convened three regional group educational activities and a working group meeting. A list of these activities is given in Annex 2. The consultants who served during the year are listed in Annex 3. PEPAS continued to cooperate in the implementation of 19 ongoing applied studies in environmental health.

The Sixth Meeting of the PEPAS Advisory Committee was held in PEPAS from 9 to 13 December 1991. The Committee, which meets biennially, reviewed the past activities of PEPAS and made proposals for the future. The Committee

members, who were appointed from China, Guam, Japan, Malaysia, New Zealand and the Philippines expressed satisfaction at the Centre's achievements and formulated 26 recommendations on various aspects of the environmental health programme, which will guide PEPAS in its future activities.

### **3.1 Community water supply and sanitation**

Activities in the water supply and sanitation sector during 1991 continued to be mainly directed towards training, technical advisory services, the provision of information, and participation in technical meetings organized by other agencies.

The International Drinking Water Supply and Sanitation Decade drew to a close in December 1990. To review the progress made during the past Decade, PEPAS cooperated in the monitoring and evaluation of national water supply and sanitation programmes. Information on various aspects of water supply and sanitation was collected and summarized to provide an assessment of Decade achievements which will be used to develop strategies for future operations.

A Regional Workshop on Operation and Maintenance of Water Supply and Sanitation Systems was held at PEPAS from 6 to 10 May 1991. Operation and maintenance has been cited as the major constraint in the water supply and sanitation sector, and the workshop provided the opportunity for the participants to discuss problems and solutions. Both technical and managerial aspects were covered and participants developed action plans for the improvement of operation and maintenance activities in their countries.

PEPAS presented keynote papers at two national meetings on drinking water quality held in Malaysia during the year, namely, the Seminar on Potable and Mineral Water organized by the Malaysian Institute of Food Technology, and the Policy Seminar on Environmental Management of Water Resources organized by the Ministry of Works.

PEPAS provided technical advisory services to Cook Islands on water supply and sanitation activities, in particular to advise on measures needed to cope with a large influx of visitors expected for the 1992 Arts Festival. Guidelines for water supply and sanitation and solid waste disposal were formulated. Recommendations were made on design alternatives for the future development of sewerage systems.

Advisory services were provided to Lao People's Democratic Republic on water supply and sanitation, particularly on the establishment of a water quality testing laboratory and future latrine construction activities. A plan of action was developed with the national authorities for a rural water supply and sanitation project funded by the Swedish International Development Authority and executed by WHO. In this project, model designs will be developed for latrines, roof catchments and gravity water supplies in two rural areas of Lao People's Democratic Republic.

In Niue, PEPAS advised on remedial measures to control bacteriological contamination of groundwater which is used as a drinking water source. Measures recommended included the protection of water catchment areas, relocation of pig farms and the introduction of a water quality monitoring programme.

PEPAS participated as a member of the secretariat of the Eleventh Meeting of the Joint WHO/FAO/UNEP/UNCHS Panel of Experts on Environmental Management for Vector Control (PEEM) held in Kuala Lumpur from 21 to 25 October 1991. This meeting focused on the design of water supply and sanitation systems in urban and rural settlements in support of vectorborne disease control.

Two applied studies in Viet Nam were completed. One dealt with the design, construction and community participation aspects of gravity water supply schemes for two villages in the mountainous areas of northern Viet Nam. The construction of the water supply scheme was successfully completed and benefited about 1100 villagers. The other study involved the development of two types of handpumps, namely, the Blair and Solomon Island type. The study concluded that both types of pumps were satisfactory for shallow well operation in Viet Nam.

### **3.2 Environmental health in rural and urban development and housing**

Activities in this programme area were mainly directed to training, technical advisory services and provision of information on environmental planning and management, solid waste management, and improvement of environmental health in urban areas.

#### **3.2.1 Environmental planning and management**

A Training Course on Environmental Planning for Small and Medium-sized cities was conducted in China in collaboration with the Chinese Research Academy of Environmental Sciences (CRAES). Participants reviewed various planning techniques for urban pollution control and land use and carried out hands-on computer exercises.

PEPAS has continued to promote the exchange of information on environmental and health impact assessment through EIA/EHIANET.

### 3.2.2 Solid waste management

PEPAS collaborated with the governments of Fiji and China in conducting a national workshop on solid waste management, and a workshop on composting of waste and sanitary landfill, respectively. These national workshops were planned and tailored to the needs and priorities of the countries, based on previous visits of PEPAS staff to the countries to assess key issues of their municipal solid waste management.

In collaboration with relevant officials in the Federated States of Micronesia and the Marshall Islands, master plans for solid waste management were prepared for Pohnpei and for Majuro. The plans provided recommendations for immediate action and set the long-term goals to improve solid waste collection and disposal services in these towns. A field visit was made to the Solomon Islands to provide technical advice on the development of a new landfill in Honiara. A joint UNDP/World Bank/WHO reconnaissance mission was made to Viet Nam to identify priority activities for future collaboration in solid waste management and prepare terms of reference for their implementation. These collaborative activities resulted in a thorough assessment of current solid waste management and action-oriented recommendations for future improvement.

PEPAS convened a Regional Workshop on Recycling and Resource Recovery from Municipal Solid Wastes in November. The workshop provided an opportunity to review technological options, and addressed public participation and institutional aspects of waste recycling. The participants prepared national frameworks for promoting recycling and resource recovery in their countries following a review of the working papers and case studies presented. Earlier in July, PEPAS co-sponsored a Regional Workshop on Integrated Waste Management Policies in Singapore with UNDP and the World Bank. This regional workshop focused on economic aspects of recycling activities and promotion of integrated waste management approaches.

An applied study on co-composting of municipal refuse and dewatered sewage sludge was implemented in collaboration with the Tongji University in China. The study produced a technical guide which would be useful to other countries of the Region, where co-composting is carried out.

A regional information network for solid waste management (SWMNET) was established during the year.

### 3.2.3 Urban environmental health

PEPAS convened the WHO Regional Working Group on Integration of Environmental Health into Planning for Urban Development in February. The members of the Working Group who comprised senior officials of health, environmental and urban planning sectors at both national and local levels of nine countries and areas in the Region, endorsed a new WHO initiative in promoting healthy urban environments throughout the Region and formulated a framework for the development of a WHO regional project on healthy urban environment. A subsequent WHO Regional Working Group on Urban Health Development, held in Osaka, Japan, in September, for which PEPAS served as a member of the secretariat, refined the framework further and generated recommendations for specific activities to be implemented under the project.

PEPAS staff participated in two regional meetings which focused on improvement of environmental management at local level, namely the UNCRD Expert Group Seminar on Environmentally Sound Management of Industrial Development - Strengthening Environmental Management Capabilities of Local Governments, held in Kitakyushu, Japan, in September; and the Second Congress of the Regional Network of Local Authorities for the Management of Human Settlements for Asia and the Pacific (CITYNET), held in Kuala Lumpur and Penang, Malaysia in November. Both meetings reiterated the need to protect and enhance health and the environment in urban areas and made proposals for better coordination among international agencies and national and local authorities.

An applied study on the development of guidelines for integrated planning of urban environmental health was completed and a software programme for an optimization routine suitable for urban environmental planning was developed. The guidelines, together with the software, could be used to determine the most cost-effective management scheme for complex urban environmental problems.

### **3.3 Health risk assessment of potentially toxic chemicals**

Under the UNDP-funded, WHO-executed project on safety and control of toxic chemicals and hazardous wastes, country profiles were prepared for China, Malaysia and Singapore; national workshops were held in China and Malaysia; and proposals were prepared for future activities to improve national capabilities in the management of toxic chemicals and hazardous wastes.

A Regional Workshop on Chemical Safety Legislation was held at PEPAS in October. It was attended by 19 participants from 16 countries and areas as well as FAO, ILO and UNEP representatives. The major outcome of the workshop

was the development of a model chemical safety law which could be used by countries in the Region to develop their own national legislation after modification to suit the country's situation.

A PEPAS consultant assessed the development of an inventory of chemicals and the needs for new regulations on the control of toxic chemicals and hazardous waste in the Philippines.

In Viet Nam, PEPAS collaborated with the Ministry of Health to conduct a training course on hazardous waste management. It provided the participants an opportunity to learn current hazardous waste management techniques and assess problems in the country.

A PEPAS staff member participated in a national training workshop on hazardous waste management in Malaysia. Participants in this workshop carried out practical exercises on treatment and disposal of specific hazardous wastes. In Malaysia, PEPAS also collaborated with the Department of Environment in conducting a training course on the monitoring of toxic pollutants in groundwater. This training course provided initial input to the development of groundwater quality monitoring systems in the country.

### **3.4 Control of environmental health hazards**

#### **3.4.1 Air quality management**

PEPAS engaged a consultant to develop an air quality index for China. Subindices for total suspended particulate matter and sulphur dioxide were derived, based on the descriptor words for air quality used in the United States Pollutants Standards Index: 'good, moderate, unhealthful, very unhealthful, and hazardous'. The subindices were applied to air quality data collected at two monitoring sites (one in Beijing, the other in Shanghai). Recommendations were made on how to further develop the index, including replacing total suspended particulate matter with particulate matter with an aerodynamic diameter less than 10 microns, and deriving subindex functions for carbon monoxide, nitrogen dioxide and ozone.

A PEPAS consultant reviewed air pollution monitoring and emissions data for Manila, and developed an air pollution prediction model for that city. The model gave good results when compared with annual average concentrations of sulphur dioxide for Manila.

Motor vehicle air pollution is prevalent in Manila, and poses a significant threat to human health. A PEPAS consultant collaborated with the Environmental



Management Bureau, Department of Environment and Natural Resources, of the Philippine Government, on the control of emissions from motor vehicles, particularly diesel-fuelled utility vehicles such as "jeepneys".

Endemic fluorosis is a severe and chronic problem in some parts of China, affecting tens of millions of people. PEPAS collaborated with the Institute of Environmental Health and Engineering in Beijing to develop measures to minimize the health problems caused by combustion of coal with high fluoride content. In this connection, a pilot study to promote public awareness of the hazards associated with fluoride in the air environment, and appropriate control measures, was initiated.

A study to audit air quality monitoring systems in China, Malaysia and the Philippines was completed. As a result, recommendations were provided to enhance the quality assurance programmes of the monitoring systems.

#### 3.4.2 Water quality management

In Malaysia, a study was completed on the evaluation of a simple method for testing faecal contamination in drinking water. The study assessed the use of a modified APHA test adaptable to field conditions where laboratory facilities are not readily available. The method, using coliphage as an indicator for faecal contamination of rural drinking water supplies, is faster than the standard coliform test. Incubation is still required but can be done in a portable unit powered by lead-acid batteries. The relationship between the coliphage count and the number of coliforms is unique for different water types. Thus, comparative studies using the traditional method and the new method are required to establish an empirical relationship between the methods.

A technical assignment in collaboration with the Standards and Industrial Research Institute of Malaysia (SIRIM) on the development of laboratory/bench-scale wastewater treatment facilities for small and medium-sized industries was completed. The focus of the activities was on the use of the activated sludge treatment systems. The bench-scale studies were initially conducted with synthetic wastewater and later with brewery wastes. SIRIM will continue the work in further phases with the aim of designing and fabricating full-scale package wastewater treatment plants for industrial use.

PEPAS collaborated with the Chinese Research Academy of Environmental Sciences (CRAES) in Beijing, China to conduct a national training course on protection of drinking water sources. The course was timely in view of the increasing pollution problems associated with drinking water sources in China.

### **3.5 Food safety**

PEPAS collaborated in conducting three training activities during the year. In Viet Nam, two food inspection workshops were held to address the public health risks associated with contaminated food and to highlight the application of Hazard Analysis Critical Control Point (HACCP) principles in food inspection. These workshops were particularly relevant since, in recent years, the state-controlled system of production, supply and distribution of food has been supplemented by a free enterprise system that is more difficult to regulate with respect to food hygiene and safety. In Papua New Guinea, PEPAS collaborated with the Department of Health to conduct a food safety legislation workshop. The workshop introduced the new Food Sanitation Act to the country's food surveillance personnel.

Technical advisory services were provided to the Governments of the People's Republic of China and Fiji. The consultant to China assessed the current use of immunoassays in the detection of mycotoxins in food. This activity has enabled the relevant institutions to increase the sensitivity and accuracy of their mycotoxin detection tests and initiated research programmes on the detection of various mycotoxins. The consultant to Fiji reviewed existing food legislation and its administration, and collaborated in the preparation of draft legislation. A revised draft of Food Safety Legislation, including the Act, Regulations and Standards, was prepared. A mechanism for ensuring coordination among various agencies for the successful implementation of the proposed legislation was also drawn up.

An applied study on the risk factors contributing to foodborne diseases in selected rural and urban communities of Malaysia was completed. The apparent increased incidence of foodborne disease during Ramadan, the Muslim fasting month, and the possible association between foodborne disease and consumption of street foods, were the concerns that led to this study. The objectives of the study were to examine food preparation and distribution systems, to apply a Hazard Analysis Critical Control Point (HACCP) approach to the study of high-risk foods and to identify practices that lead to foodborne disease. Based on the results of the study, it will be possible to design and implement intervention strategies for foodborne disease that may have broader application to the Region.

Another study on the development of a compendium of rapid, commercially available and 'classical' analyses for food contaminants was also completed. As the laboratory expertise and facilities are limited in many parts of the Region and because the transportation of samples can be quite costly, the study aimed to develop a field testing kit suitable for the detection of food contaminants.

As many of the countries and areas of the Region import large quantities of food, it is essential that adequate import inspection and/or certification programmes should be in place. To facilitate this, PEPAS prepared a food inspection manual for imported foods that may act as a model for the Region. This manual provides direction on the responsibilities of the food inspector, sampling programmes and equipment, wharf examination, and microbiological and chemical analyses that should be considered. It also proposes action on foods identified as unsatisfactory.

PEPAS continued activities in support of the GEMS food contamination monitoring programme. It continued to offer the services of the food safety information sharing network (FOS INFONET), expanded its video library to in excess of 70 videos, attended to numerous requests for information on a diverse range of food safety topics and updated the PEPAS document "Food Safety Services in the Western Pacific Region".

#### **4. COLLABORATION WITH INTERNATIONAL AND BILATERAL AGENCIES**

PEPAS continued to maintain its contact with other international and bilateral agencies involved in environment-related activities. Activities implemented during the year in collaboration with these external agencies were the project on safety and control of toxic chemicals and hazardous wastes funded by UNDP; the UNDP/World Bank regional workshop on integrated waste management policies; and the regional workshop on recycling and resource recovery from municipal wastes funded by the Japanese Special Programme on Technology Transfer. PEPAS staff attended meetings organized by other agencies, for example, the Economic and Social Commission for Asia and the Pacific (ESCAP) Meeting of Senior Officials on Environment and Development in Asia and the Pacific held in Bangkok, Thailand, in February 1991; the First Pacific Islands Environmental Health Conference: Mobilizing Resources for Effective Environmental Health Programme organized by the South Pacific Regional Environmental Programme (SPREP) in Noumea, New Caledonia in August 1991; the United Nations Centre for Regional Development (UNCRD) Expert Group Seminar on Environmentally Sound Management of Industrial Development in Asian countries held in Kitakyushu, Japan in September 1991; and the Second Congress of the Regional Network of Local Authorities for the Management of Human Settlements for Asia and the Pacific, organized by ESCAP, the United Nations Centre for Human Settlements (UNCHS) and the City of Kuala Lumpur held in Kuala Lumpur and Penang in November 1991.

During the year, PEPAS worked closely with the Food and Agriculture Organization (FAO) and the International Atomic Energy Agency (IAEA) to plan for the organization of the WHO/IAEA/FAO Seminar on Harmonization of Regulations on Food Irradiation to be held in January 1992.

## **5. INFORMATION SERVICES**

One of the roles of the Centre is to provide information services in environmental health. In 1991, PEPAS attended to 220 requests for information on specific environmental health topics. To further publicize PEPAS activities in information services, a leaflet on the Regional Information Service Programme (RISP) was published.

Information exchange network activities continued through the networks on environmental impact assessment/environmental health impact assessment (EIA/EHIANET), food safety (FOS INFONET), and solid waste management (SWMNET).

## **6. PEPAS REPORTS AND DOCUMENTS**

The reports on activities implemented in 1991 (as listed in Annex 2) are available on request from PEPAS, provided they have been derestricted by the governments. Other technical documents issued in 1991, which are available on request, are listed in Annex 4.

## PEPAS STAFF DURING 1991

Dr P. Guo	Director
<b>Technical staff</b>	
Mr B. Fisher	Sanitary Engineer
Dr G. Moy	Food Safety Adviser (until 25 February 1991)
Dr H. Ogawa	Environmental Systems Engineer
Mr K. Rolfe	Air Quality Management Adviser (w.e.f. 21 October 1991)
Mr T. Dafoe	Water Quality Management Adviser (w.e.f. 4 October 1991)
(Vacant since January 1990)	Chemical Safety Adviser
<b>Administrative staff</b>	
Ms L.Y. Chan	Administrative Officer
<b>Programme support staff</b>	
Ms Y.M. Tan	Special Assistant
<b>Secretaries</b>	
Ms Normah Mahmud	
Ms M.R. Tan	
Ms L.M. Lai	
Ms M. Pieris	
<b>Drivers/Messengers</b>	
Mr Shahrudin Asmuni	
Mr Masim Satarum	

**TECHNICAL COOPERATION ACTIVITIES AND FIELD VISITS - 1991**

Activity	Carried out by	Date
<b>AMERICAN SAMOA</b>		
1. Field visit to assess PEPAS collaborative activities in environmental health	P. Guo	10-14 Aug
<b>CHINA</b>		
1. Advisory services on safety and control of toxic chemicals and hazardous wastes	T. Shen	8-30 Mar
2. Collaboration in the conduct of a training course on environmental planning for small and medium-sized cities	L. Brown, G. McDonald	20-31 May
3. Collaboration in the conduct of a national workshop on the reuse of nightsoil for agriculture and aquaculture	P. Guo	27-29 Jun
4. Collaboration in the conduct of a national workshop on safety and control of toxic chemicals and hazardous wastes, and preparation of proposals for the implementation of workshop recommendations	T. Shen	21 Aug- 8 Sep
5. Collaboration in the conduct of a national workshop on composting of waste and sanitary landfill	L. Diaz, H. Ogawa	9-18 Sep
6. Collaboration in the conduct of a training course on conservation techniques for drinking water sources	S. Barabas, D. Liu	5-22 Oct
7. Advisory services on analysis of mycotoxins in food using ELISA-based methods	F.S. Chu	5 Oct- 15 Nov
<b>COOK ISLANDS</b>		
1. Advisory services on assessment of sewerage development, and monitoring of progress in the water supply and sanitation sector	B. Fisher	19-24 Mar

Activity	Carried out by	Date
<b>COOK ISLANDS (Contd.)</b>		
2. Field visit to assess PEPAS collaborative activities in environmental health	P. Guo	8-10 Aug
<b>FIJI</b>		
1. Collaboration in the conduct of a national workshop on solid waste management	H. Ogawa	2-8 Feb
2. Monitoring of progress in the water supply and sanitation sector	B. Fisher	26-30 Mar
3. Advisory services on food safety legislation	R. Bhat	20 May-9 Jul
<b>KIRIBATI</b>		
1. Monitoring of progress in the water supply and sanitation sector	B. Fisher	30 Mar-3 Apr
<b>LAO PEOPLE'S DEMOCRATIC REPUBLIC</b>		
1. Advisory services on rural water supply and sanitation	B. Fisher	18-27 Jun
<b>MALAYSIA</b>		
1. Advisory services on development of package wastewater treatment plants	P. Guo	Intermittent input from 1987 to 1991
2. Advisory services on safety and control of toxic chemicals and hazardous wastes (Phase 2)	P. Douglas	22 Apr-3 May
3. Collaboration in the conduct of a national workshop on safety and control of toxic chemicals and hazardous wastes, and preparation of proposals	D. Barnes. P. Douglas	10-13 Jun
4. Advisory services on development of environmental quality surveillance and monitoring programme for toxic pollutants (Phase 2)	C. Barber	14 Jul-10 Aug

Activity	Carried out by	Date
<b>MARSHALL ISLANDS</b>		
1. Advisory services on municipal solid waste management (Phase 1)	H. Ogawa	7-13 Apr
2. Monitoring of progress in the water supply and sanitation sector	B. Fisher	3-6 Apr
3. Advisory services on municipal solid waste management (Phase 2)	E. Ouano	2-27 Jun
<b>MICRONESIA, FEDERATED STATES OF</b>		
1. Monitoring of progress in the water supply and sanitation sector	B. Fisher	6-10 Apr
2. Advisory services on the development of a solid waste management plan for Pohnpei	H. Ogawa	24 Mar-7 Apr
<b>NIUE</b>		
1. Field visit to investigate the problems of bacteriologically contaminated drinking water	P. Guo	14-16 Aug
<b>PALAU</b>		
1. Monitoring of progress in the water supply and sanitation sector	B. Fisher	10-12 Apr
<b>PAPUA NEW GUINEA</b>		
1. Advisory services on the national food safety programme and collaboration in the conduct of a food safety legislation workshop	A. Hazzard	28 Sep-12 Oct
<b>PHILIPPINES</b>		
1. Advisory services on computerization of air quality statistical data	P. Manins	3 Feb-16 Mar
2. Advisory services on motor vehicle emission control	J. Elston	2-30 Mar
3. Advisory services on toxic substances and hazardous wastes - inventory, rules and regulations, and training needs	A. Liem	30 Mar-30 Apr



Activity	Carried out by	Date
<b>SAMOA</b>		
1. Monitoring of progress in the water supply and sanitation sector	B. Fisher	24-26 Mar
2. Field visit to assess collaborative activities in environmental health	P. Guo	2-8 Aug
<b>SINGAPORE</b>		
1. Development of a country profile on safety and control of toxic chemicals and hazardous wastes	R. Graham	13-28 Jan
<b>SOLOMON ISLANDS</b>		
1. Field visit on solid waste management	H. Ogawa	27 Jan- 1 Feb
<b>VIET NAM</b>		
1. Joint WHO/UNDP/World Bank reconnaissance mission to identify salient issues on solid waste management	H. Ogawa	6-13 Jul
2. Collaboration in the conduct of a national training programme on hazardous waste management	J. Spickett	18-28 Nov
3. Collaboration in the conduct of workshops in Hanoi and Ho Chi Minh City on food safety and inspection with particular emphasis on the Hazard Analysis Critical Control Point procedure	K. Leighton, J. Lytwyn	14 Oct- 2 Nov

Activity	Carried out by	Date
<b>REGIONAL ACTIVITIES</b>		
1. Regional working group meeting on integration of environmental health into planning for urban development, Kuala Lumpur, Malaysia	K.S. Lee, H. Ogawa R. Simpson, S. Tamplin	25 Feb- 1 Mar
2. Regional workshop on operation and maintenance of water supply and sanitation systems, Kuala Lumpur, Malaysia.	A. Anderson, B. Fisher, J. Hueb	6-10 May
3. Regional workshop on chemical safety legislation, Kuala Lumpur, Malaysia	L. Mortimer, H. Ogawa, M. Prabhu	7-11 Oct
4. WHO/UNDP/World Bank regional workshop on recycling and resource recovery from municipal solid wastes, Kuala Lumpur, Malaysia	H. Ogawa E. Ouano, J.H. Tay	11-15 Nov
5. Coordination of the UNEP/WHO Global Environmental Monitoring System (GEMS) air quality monitoring project	PEPAS staff	Continually
6. Coordination of the GEMS water quality monitoring project	PEPAS staff	Continually
7. Coordination of the GEMS food contamination monitoring project	PEPAS staff	Continually
8. Coordination of the GEMS human exposure assessment locations (HEAL) project	PEPAS staff	Continually
9. Environmental information service programme	PEPAS staff	Continually

Activity	Carried out by	Date
<b>OTHER ACTIVITIES</b>		
1. Attendance at the meeting of senior officials on environment and development in Asia and the Pacific, Bangkok, Thailand	P. Guo	13-19 Feb
2. Attendance at the UNDP/World Bank regional workshop on integrated waste management policies, Singapore	H. Ogawa	30 Jun- 6 Jul
3. Attendance at the first Pacific Islands environmental health conference: mobilizing resources for effective environmental health programmes, Noumea, New Caledonia	P. Guo	19-23 Aug
4. Attendance at the WHO regional working group on urban health development, Osaka, Japan	H. Ogawa	17-22 Sep
5. Attendance at the UNCRD Expert group seminar on environmentally sound management of industrial development in Asian countries, Kitakyushu, Japan	H. Ogawa	25-28 Sep
6. Attendance at the Eleventh Meeting of the Joint WHO/FAO/UNEP/UNCHS Panel of Experts on Environmental Management for Vector Control (PEEM), Kuala Lumpur, Malaysia	B. Fisher	21-25 Oct
7. Attendance at the Second Congress of the regional network of local authorities for the management of human settlements for Asia and the Pacific, Kuala Lumpur and Penang, Malaysia	B. Fisher	4-8 Nov

**SHORT-TERM CONSULTANTS - 1991**

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## LIST OF TECHNICAL DOCUMENTS ISSUED IN 1991

### 1. Reports on technical cooperation activities and field visits

Reports are available on all technical cooperation activities and field visits listed in Annex 2.

### 2. Papers presented at Regional Working Group Meeting on Integration of Environmental Health into Planning for Urban Development

Themes and issues of the meeting

Recent developments in WHO's programme for environmental health in urban development

Overview of WHO urban environmental health activities in the Western Pacific Region: Towards a healthy urban environment

WHO's approaches and programme for urban primary health care development in the Western Pacific Region

Environmental planning and management at the United Nations Centre for Regional Development (UNCRD)

Australian experience in the Healthy Cities

Technical options

Institutional options

Environmental impact assessment for the Bundang New Village construction project

### 3. Papers presented at Regional Workshop on Operation and Maintenance of Water Supply and Sanitation Systems

Overview of operation and maintenance in community water supply and sanitation in the Western Pacific Region

Strategies for implementing operation and maintenance programmes

Management of operation and maintenance

Priority projects directed towards the optimization of water supply and sanitation systems

Sewerage operation and maintenance control

Preventive maintenance

Water leakage control

Development of management information systems for operation and maintenance

Demand management

**4. Papers presented at Regional Workshop on Chemical Safety Legislation**

Chemical safety issues in the Western Pacific Region

Review of chemical safety legislation in Europe and North America

Approaches to chemical safety legislation

Review of UNEP model national legislation

Model chemical safety legislation - general provision

Notification, registration and assessment

The work of ILO in chemical safety

Classification, packaging, labelling and advertising

Production, storage, processing, sale, marketing, distribution, users, applicators, importation, exportation

Transportation, treatment and disposal

Licensing

Protection of workers, community/victims

Administration and enforcement



**5. Papers presented at Regional Workshop on Recycling and Resource Recovery from Municipal Solid Wastes**

Key issues on municipal solid waste recycling and resource recovery

Municipal solid waste recycling and resource recovery in the Western Pacific Region

Separation and sorting in recycling

Composting of organic waste

Energy recovery techniques

Role of the public in recycling

Management/system options for public participation

National initiatives for waste minimization and resource recovery

Institutional arrangements at local level

Malaysia case study: National initiative and future perspective

Republic of Korea case study: Recycling activities at local level

Regional information exchange