

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

(PEPAS)



SUMMARY OF 1990 ACTIVITIES

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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/workshops to develop and train environmental health manpower, 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 1990. Three posts were vacant during the year as a result of promotion, reassignment and resignation. These posts are expected to be filled in 1991.

3. HIGHLIGHTS OF ACTIVITIES UNDERTAKEN

In 1990, PEPAS collaborated with national agencies, research/training institutions and local governments in 16 countries and areas of the Western Pacific Region on various environmental health activities. Altogether, 41 collaborative activities were implemented by staff members and/or consultants. A list of these activities is given in Annex 2. PEPAS convened three regional group educational activities and a working group meeting.

The Centre continued to promote applied studies in the field of environmental health. A brief outline of applied studies initiated in 1990 is given in Annex 3. The consultants who served during the year are listed in Annex 4.

3.1 Community water supply and sanitation

Activities in this area were mainly directed to training, technical advisory services and provision of information on various aspects of water supply and sanitation. PEPAS collaborated with the governments of Lao People's Democratic Republic, Malaysia and Viet Nam in implementing five national training courses. Five assignments on technical aspects of water supply and sanitation programmes were carried out; two in China, and one each in Federated States of Micronesia, Malaysia and Papua New Guinea. Other activities included participation of PEPAS staff in various meetings, the holding of a Working Group meeting on Water Supply Management and implementation of three applied studies.

Three national workshops in Viet Nam on water quality monitoring and upgrading of water treatment plants, including a one-day seminar on treatment plant design, were held with PEPAS technical support. A total of 107 participants attended these meetings. The workshops and seminar should lead to improved operation standards of many existing water treatment plants which are currently producing water of substandard quality.

A technical assignment carried out by a PEPAS staff member in Papua New Guinea provided measures to control the problems caused by human wastes discharged from the coastal villages in and around Port Moresby. Although the basic problems will remain unless major engineering works are undertaken, the practical measures recommended will reduce the health hazards faced by the villagers.

An outbreak of cholera in Chuuk State of the Federated States of Micronesia prompted the Government to request PEPAS collaboration to advise on improvements of water supply and sanitation for cholera prevention in the future. The proposals, when implemented, will prevent further outbreaks in the areas which are currently prone to these problems owing to poor water supply and sanitation facilities.

In China, a World Food Programme project will resettle more than 100 000 people to a large irrigated area in Gansu Province. A technical assignment on water supply and sanitation systems for the settlers was carried out by a PEPAS staff member. The proposals made during the assignment will ensure low-cost installations which will reduce morbidity and mortality in the area. Following this assignment, the PEPAS staff member joined a review mission of a China/World Bank Project on low cost water supply and sanitation in Xinjiang Province. This mission made various recommendations to improve the project.

PEPAS engaged a consultant to study the development programme for urban sewerage in Malaysia. Recommendations on various policy and technical issues were made which will help guide future operations in the sector.

A Working Group on Water Supply Management was sponsored by the Government of Japan and attended by ten temporary advisers invited from eight countries in the Western Pacific Region. The meeting served as a useful forum for the exchange of information on the latest issues concerning water supply management. This was beneficial to the participants, most of whom were senior water supply personnel, who would be able to make use of the knowledge gained to improve water supplies in their countries. The Working Group made recommendations which will help WHO to formulate collaborative programmes with Member States in specific areas of the water supply sector.

An applied study implemented through a technical services agreement covering the installation of a gravity water supply system in Mai Chau, Viet Nam was completed. Other ongoing applied studies included latrine construction programmes in rural areas in Lao People's Democratic Republic; development of a prototype latrine for Christmas Island, Kiribati; and development of a handpump pilot project in Viet Nam.

3.2 Environmental health in rural and urban development and housing

3.2.1 Solid waste management

A one-week regional workshop on municipal solid waste management was held from 26 February to 2 March 1990. It was attended by 26 participants from 11 countries in the Region. The participants reviewed draft guidelines for the formulation and implementation of a national action plan for municipal solid waste management, which were based on the experience in Malaysia. Participants from nine countries, where no such national plan existed, benefited from the exchange of ideas, which enabled them to prepare frameworks for the formulation of an action plan for their own countries.

PEPAS collaborated with the Ministry of Health, Lao People's Democratic Republic in conducting a national workshop on solid waste management. Urban areas in Lao People's Democratic Republic have undergone serious environmental degradation in the past decade, as a result of rapid population growth and lack of infrastructure development. Solid waste management is one of the severe problems in urban areas and the workshop generated useful discussions and recommendations for future action.

Municipal solid waste management practices in a number of cities and towns of some Member States were assessed, and measures to improve the present practices were recommended by a PEPAS staff member. The cities/towns visited were Anyang, Langfang, Nantong, Weihai, Wuxi and Yantai in China; Suva in Fiji; Pakse and Savannakhet in Lao People's Democratic Republic; Baguio, Cebu, Laoag and Lapu-lapu, Mandaue and Olongapo in the Philippines; Honiara in Solomon Islands; Nuku'alofa in Tonga; and Port Vila in Vanuatu. At the end of the assessment, two to three landfill sites were identified for future use in Honiara, Nuku'alofa and Port Vila, and a draft national plan was formulated for the Philippines.

During the last quarter of 1990, a regional information network in solid waste management (SWMNET) was established. Questionnaire surveys and distribution of network circulars are planned for 1991 by PEPAS in collaboration with the Institute of Public Health, Japan.

A study on co-composting of refuse and dewatered wastewater sludge was implemented in collaboration with the environmental health faculty staff of the Tongji University in China. The study will produce technical guidelines for co-composting of refuse and sludge which could benefit other countries in this Region.

3.2.2 Environmental impact assessment

A technical assignment on training programme development for environmental impact assessment (EIA) was implemented in the Philippines in collaboration with the Environmental Management Bureau (EMB) to prepare training modules and programmes, case-study materials, and scoping guidelines for EIA. Recommendations were made on how the management of EIA programmes at EMB could be improved.

The regional information network on environmental impact assessment and environmental health impact assessment (EIA/EHIANET), which was established in late 1988, continued to provide timely information to, and promote information exchange among, its members. The Griffith University in Australia has been awarded a contract to continue the preparation and distribution of the network circulars.

3.2.3 Risk assessment

A consultant was provided to the Philippine Environmental Management Bureau, to support the training of personnel in risk assessment and management. This activity forms part of the initial phases of a risk management case-study of the Laguna de Bay industrial region.

In Malaysia, PEPAS collaborated with the National Institute of Public Administration and the Asian Development Bank to conduct a workshop on environmental risk analysis. A paper on an area-wide risk assessment case-study in Terengganu, Malaysia, which was implemented as a PEPAS applied study, was presented by a PEPAS staff member at the workshop.

3.2.4 Urban environmental health

PEPAS collaborated with the Institute of Environmental Health and Engineering in Beijing, China to conduct a workshop on systems analysis for management and planning of urban environmental systems. The participants were provided with a number of systems analysis techniques and carried out hands-on exercises using microcomputers. The workshop has strengthened the skill of participants in the use of systems analysis as a tool for urban environmental health planning.

A study on improvement of environmental health in selected suburban villages in Malaysia was completed. It has been carried out since 1988 by the University of Agriculture in cooperation with the Ministry of Housing and Local Government, Ministry of Health, relevant local governments and communities, and PEPAS. The study, with emphasis being placed on solid waste management, produced and implemented action plans for two villages to improve their sanitation

The Chinese Research Academy of Environmental Sciences in Beijing recently initiated a PEPAS-sponsored study to compile guidelines for integrated optimal planning for urban environmental management. This study will produce a guideline document as well as a microcomputer programme to assist in the urban planning process.

PEPAS collaborated with the Environmental Protection Centre of the Viet Nam Institute of Tropical Technology and Environmental Protection in conducting a national training course on practical aspects of environmental sciences and technologies in Ho Chi Minh City. The participants were introduced to various methods and procedures in environmental planning and impact assessment, air and water quality management, municipal solid and hazardous waste management, water supply and wastewater engineering.

3.3 Health risk assessment of potentially toxic chemicals

3.3.1 UNDP/WHO project

The implementation of the regional project on safety and control of toxic chemicals and hazardous wastes was commenced in 1990. The project, funded by UNDP and executed by WHO, involves six countries, namely, China, Hong Kong, Malaysia, Philippines, Republic of Korea and Singapore. Activities under this project are being planned for implementation in 1991 and 1992. The project will enhance the national capabilities of participating countries in dealing with the management of toxic chemicals and hazardous wastes.

3.3.2 Hazardous waste management

Two consultants collaborated with the National Environmental Protection Agency in China to conduct a training workshop on hazardous waste management in Guangzhou. The workshop introduced the participants to various technical and managerial approaches to hazardous waste management.

3.3.3 Chemical consumer products

In order to protect people from the harmful effects of potentially toxic chemical consumer products, the Government of the People's Republic of China is planning to establish a set of regulations and standards for their control. A consultant was provided to the Institute of Environmental Health Monitoring to develop a programme for the control of these products. Recommendations were given on the procedures for the establishment of a regulatory programme and a data base on toxic products.

3.4 Control of environmental health hazards

3.4.1 Air quality management

PEPAS cooperated with the Institute of Environmental Health Monitoring, China to develop air quality indices for monitoring and assessment of air quality. At a workshop on the subject, the latest health effects of air pollution were presented and discussed. The indices that were developed will help in better understanding air quality trends.

Endemic fluorosis is a problem in many areas of China where residents use coal with high fluoride content for cooking and heating. As a result, there is a high intake of fluoride through inhalation and through consumption of food contaminated by coal smoke. A WHO-funded applied study to perform a "Knowledge-Attitude-Belief-Practice" (KABP) survey related to endemic fluorosis is under implementation.

Advisory services were provided to the Department of Environment, Malaysia on air dispersion modelling, particularly on the development of air quality models for the Kelang Valley.

A quality assurance programme to audit and calibrate air quality monitoring stations in China, Malaysia and the Philippines was implemented by a team of two experts from the Institute of Public Health, Japan. Training on monitoring, calibration and equipment maintenance was provided to improve the quality assurance of air quality monitoring programmes in these countries.

National agencies continued to contribute data to the ongoing UNEP/WHO GEMS project on air quality monitoring. During the year, the Office of Research and Development of the United States Environmental Protection Agency, which serves as a WHO Collaborating Centre on the project, undertook a review of the adequacy of existing sites to determine if changes in the monitoring programme were warranted.

3.4.2 Water quality management

Advisory services were provided to the Philippines on marine pollution monitoring. The consultant designed monitoring programmes for recreational and shellfish growing waters and trained personnel on marine monitoring technologies and water quality data management.

A PEPAS staff member visited Fiji, Tonga and Kiribati to assess the water pollution problems and drinking water quality monitoring activities, follow up on current PEPAS collaborative activities and discuss the countries' requirements for future collaboration.

A regional workshop on health and technical aspects of nightsoil and wastewater use was held at PEPAS from 24 to 28 September 1990. The main objectives were to introduce the new WHO guidelines on the subject and to examine current practices in nightsoil and wastewater use in rural and urban areas. Following the workshop, it is expected that the health risks associated with the use of nightsoil and wastewater will be reduced in the Region through the promotion of better treatment of nightsoil and wastewater and improvement in the method of their application as suggested in the WHO Guidelines for the Safe Use of Wastewater and Excreta in Agriculture and Aquaculture (1989). Fourteen participants from nine countries of the Region attended the workshop.

A study on the health assessment of nightsoil and wastewater use for agriculture and aquaculture in China was completed. The main objective of the study was to define the health risks and to develop a practicable system for nightsoil/wastewater treatment, disposal and reuse. The study, which had been carried out in four cities in China since 1988, yielded some interesting results on the presence of pathogens in 500 samples of nightsoil, wastewater, groundwater, sludge, soil, fish and vegetables. The epidemiological study revealed that the infection rate of ascariasis among farmers in the polluted areas was 79% while the infection rate of clonorchis, for people who ate raw fish, was 100%.

Another study carried out in China on women's participation in the monitoring and improvement of drinking water quality in a selected county was completed. Work carried out under the study included the establishment of water quality monitoring and protection programmes which, if implemented, should lead to the reduction of waterborne diseases.

An applied study on methods of monitoring the bacteriological quality of drinking water was implemented during 1990. The results are expected to provide valuable information on appropriate field testing methods for drinking water quality monitoring in rural areas where laboratory facilities are not available.

National agencies continued to contribute data to the ongoing UNEP/WHO GEMS water quality monitoring project. With the completion of the first phase of the project, covering twelve years from 1979 to 1990, monitoring data collected from all network stations will be evaluated and processed in a comprehensive assessment study which will be published by WHO Headquarters in 1992. The second phase of the project, commencing in 1991, will have a revised global network of monitoring stations, including existing as well as newly selected ones. The data reporting format will also be improved.

3.4.3 Occupational health and safety

In Fiji, a consultant was provided to recommend legislative requirements and an institutional framework for developing and implementing occupational health and safety programmes.

A workshop was conducted in collaboration with the Government of Viet Nam on health impacts of industrial emissions. The workshop emphasized the role of environmental epidemiology and field techniques to investigate the occupational health problems of various industries.

The first phase of a survey on the extent and severity of noise-induced hearing loss of Vietnamese workers, supported by WHO research funds, was completed. Audiometric examinations of about 1000 workers at various factories with high noise levels were made. The results of the study will promote awareness among factory managers of the adverse effects of noise pollution on workers' health and encourage them to implement strategies for prevention and control of hearing loss.

3.4.4 Other activities

A PEPAS staff member participated in the ESCAP Expert Group Meeting held in Bangkok from 30 April to 4 May 1990 to review and discuss the report on the State of the Environment prepared by ESCAP. He also attended a subsequent ESCAP Ministerial-level conference on environment and development in Asia and the Pacific held in October. The staff member also served in the Secretariat for the first meeting of the WHO Commission on Health and the Environment held in Geneva in June.

The objective of the Commission is to assess the consequences to human health of environmental degradation arising from socioeconomic development over the next two decades. The report of the Commission will form part of WHO's contribution to the United Nations conference on Environment and Development to be held in June 1992.

A staff member visited Brunei Darussalam in October 1990 to participate in their World Health Day Seminar on Environment and Development. He also reviewed past collaborative activities and discussed plans for future activities.

3.5 Food safety

During the year, visits were made by a PEPAS staff member to nine countries and areas of the Region to advise on food safety programmes.

PEPAS cooperated with the Institute of Nutrition and Food Hygiene in a total diet study of nutrition and food contamination in China. This cooperation was extended as part of the Joint FAO/WHO Food Contamination Monitoring Programme being carried out under the UNEP/WHO Global Environmental Monitoring system (GEMS) food contamination monitoring project. PEPAS serves as the regional coordinating centre for this project.

A technical assignment was implemented to cooperate with the Bureau of Food and Drugs, Department of Health, Philippines in the strengthening of food safety programmes. This activity included the development of principles for the establishment of microbiological criteria for food, a plan for the development of a food contamination monitoring programme and the formulation of recommendations for further development of food safety control programmes.

A consultant was provided to advise the Municipality of Beijing, China on food safety in preparation for the Asian Games held in September 1990. The consultant reviewed the preparations for the mass catering of athletes and officials and provided specific recommendations for assuring the safety of food served during the Games.

Some of the Pacific Island countries and areas have a high incidence of foodborne diseases. A PEPAS staff member visited six of these countries and areas to advise on improvement of food safety programmes. In Tonga, proposals were developed for the integration of food safety into a specific foodborne disease control and prevention programme, namely for typhoid fever. Typhoid fever is endemic in Tonga and a serious public health concern which is to be addressed by a combination of immunization and public health education. In Tuvalu, the need for establishing some activity in the food safety area, because of the high rates of foodborne diseases in the country, was discussed. A review was made of the food safety situation in Kiribati, where foodborne diseases, including endemic typhoid fever, are serious public health problems. As a result of this visit, Kiribati joined the Codex Alimentarius Commission. The foodborne disease problems in the Marshall Islands and the steps undertaken to control and prevent them were reviewed. In the Federated States of Micronesia, the PEPAS staff member discussed, among other things, implementation of food safety activities under the regular country budget, which included provisions for two fellowships and a consultant. Finally, a visit was made to the Republic of Palau to review foodborne disease problems, and to discuss future collaboration to address these problems.

In collaboration with the Danish International Development Agency (DANIDA), a regional training course on food safety was held in Suva, Fiji in December 1990. It was attended by 17 health officials from 13 Pacific Island countries and areas.

A regional seminar on food safety legislation was convened at PEPAS from 27 to 30 August. It was attended by eighteen participants from sixteen countries and areas as well as five representatives and observers. The seminar successfully met its objectives, specifically the development of a model food safety law for consideration by countries in the Region. The seminar report should be extremely useful to Member States in developing their food safety programmes by providing a sound legislative basis for food control.

WHO sponsored the First Asian Conference on Food Safety which was held in Kuala Lumpur from 2 to 7 September. PEPAS worked closely with conference panelists in preparing the Regional Action Plan which was adopted by conference participants, comprising about 450 people from 33 countries and areas. WHO provided support for thirteen participants from developing

countries to attend the conference as well as local costs. The Regional Action Plan is one of the most important food safety initiatives and reflects the growing consensus of governments, industry and consumers on the need to improve the safety of food in the Region.

A PEPAS staff member served in the WHO Secretariat for the Codex Coordinating Committee for Asia which met in Chiang Mai, Thailand from 5 to 12 February and for the First Session of the Codex Coordinating Committee for North America and the South-West Pacific in Honolulu, Hawaii from 30 April to 4 May.

During 1990, PEPAS implemented four applied studies in the food safety area through contractual services agreements, namely, rapid methods of analysis for food safety; safety of shellfish in Fiji; risk factors for foodborne diseases in a rural area of Malaysia; and a study on the hazards of foods consumed by students in their homes, at the school cafeteria and street food stalls. A brief outline of each study is given in Annex 3.

PEPAS continued to expand the scope of the PEPAS food safety information sharing network (FOS INFONET). In addition to regulatory affairs, three new sub-networks were established in toxicology, epidemiology and laboratory aspects of food safety. The PEPAS video library collection was expanded and three FOS INFONET Newsletters were issued. Numerous requests for information were attended to.

4. COLLABORATION WITH INTERNATIONAL AND BILATERAL AGENCIES

PEPAS continued to maintain its contact with other international and bilateral agencies involved in environment-related activities. These agencies included the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), International Water and Sanitation Centre (IRC), Food and Agriculture Organization (FAO), Economic and Social Commission for Asia and the Pacific (ESCAP), Asian Development Bank (ADB), World Bank, Danish International Agency for Development (DANIDA), South Pacific Regional Environmental Programme (SPREP), International Reference Centre on Waste Disposal (IRCWD) and the Water and Sanitation for Health (WASH) Centre of the United States Agency for International Development. Extrabudgetary funding sources for PEPAS activities in 1990 were the Japanese Special Programme on Technology Transfer, Japan Shipbuilding Industry Fund, DANIDA and the United Nations Development Programme.

5. INFORMATION SERVICES

PEPAS continued to provide technical information services in response to requests, and to distribute environmental health publications issued by WHO and other agencies. During the year, the PEPAS query-response service attended to about twelve requests per month for information on specific environmental health topics and distributed publications to approximately 400 individuals and agencies in the Region.

PEPAS regional information exchange network activities have expanded with an additional network on solid waste management during 1990. The networks on food safety and environmental health impact assessment (i.e. FOS INFONET and EIA/EHIANET, respectively) continued to serve the network members in the Region. An information network on water supply and sanitation is being planned.

6. PEPAS REPORTS AND DOCUMENTS

The reports on activities implemented in 1990 (as listed in Annex 2) are available on request from PEPAS, provided they have been derestricted by the respective governments. Other technical documents issued in 1990, which are available on request, are listed in Annex 5.

PEPAS STAFF DURING 1990

Dr P. Guo

Director

Technical staff

Mr B. Fisher

Sanitary Engineer

Dr G. Moy

Food Safety Adviser

Dr H. Ogawa

Environment Systems Engineer

(Vacant since January 1990)

Air Quality Management Adviser

(Vacant since December 1989)

Water Quality Management Adviser

(Vacant since January 1990)

Chemical Safety Adviser

Administrative staff

Mr S.P. Sardana

Administrative Officer

(until August 1990)

Ms L.Y. Chan

Administrative Officer

(with effect from May 1990)

Programme support staff

Ms Y.M. Tan

Special Assistant

Secretaries

Ms Normah Mahmud

Ms M.R. Tan

Ms L.M. Lai

Ms M. Pieris

Drivers

Mr Shahrudin Asmuni

Mr Masim Satarum

TECHNICAL COOPERATION ACTIVITIES AND FIELD VISITS, 1990

Activity	Carried out by	Date
BRUNEI DARUSSALAM		
1. Participation in World Health Day Seminar on Environment and Health, and discussions on collaborative activities	P. Guo	8-10 Oct
CHINA		
1. Participation in an international workshop on the control of environmental pollution in China	P. Guo	12-18 Feb
2. Conduct of a workshop on systems analysis for management and planning of urban environmental systems	J. Male, M. Nakamura & H. Ogawa	11-22 Jun
3. Advisory services on food safety during the 1990 Asian Games	H.H. Kim	15 Jul - 12 Aug
4. Advisory services on development of air quality indices	W. Hunt	23 Aug - 16 Sep
5. Assessment of solid waste management in small- to medium-sized cities	H. Ogawa	16 Sep - 15 Oct
6. Advisory services on water supply and sanitation aspects of China/World Food Programme Project in Gansu Province	B. Fisher	7-19 Oct
7. Advisory services on a pilot study on the total diet survey	J. Jones	14 Oct - 8 Nov
8. Review of China/UNDP/World Bank low-cost rural water supply and sanitation project in Xinjiang Province	B. Fisher	19-26 Oct
9. Advisory services to develop a national programme for the control of potentially toxic consumer products	C. Jacobson	3 Nov - 2 Dec
10. Conduct of a training workshop on hazardous waste management	T. Shen & J. Spickett	7-14 Dec

Activity	Carried out by	Date
FIJI		
1. Field visit to discuss food safety	G. Moy	3-6 Apr
2. Advisory services on development of occupational health and safety services	P. Psaila-Savona	3-23 Oct
3. Field visit to assess collaborative activities in environmental health	P. Guo	12-15 Nov
KIRIBATI		
1. Field visit to discuss food safety	G. Moy	15-18 Apr
2. Field visit to assess collaborative activities in environmental health	P. Guo	21-23 Nov
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
1. Conduct of a workshop on solid waste management	D. Campbell & H. Ogawa	27 Aug - 1 Sep
2. Field visit to selected provinces to review solid waste management programmes	H. Ogawa	3-6 Sep
MALAYSIA		
1. Advisory services on the sewerage and urban sanitation development programme	G. Burns	8-31 Jan
2. Participation in a workshop and case study on environmental risk assessment	H. Ogawa	20-23 Aug
3. Advisory services on environmental health in urban settlements	H. Ogawa	Intermittently during 1989-1990
MARSHALL ISLANDS		
1. Field visit to discuss food safety	G. Moy	19-21 Apr
MICRONESIA, FEDERATED STATES OF		
1. Field visit to discuss food safety	G. Moy	22-26 Apr
2. Advisory services on sanitation improvements for cholera prevention in Chuuk State	B. Fisher	24-30 Jun

Activity	Carried out by	Date
PALAU		
1. Field visit to discuss food safety	G. Moy	27-28 Apr
PAPUA NEW GUINEA		
1. Advisory services on control of sea pollution by excreta disposal in coastal housing areas	B. Fisher	17 Feb - 3 Mar
PHILIPPINES		
1. Advisory services on development of a national plan for solid waste management	H. Ogawa	14 Mar - 13 Apr
2. Advisory services on risk assessment and management.	M. Rowe	2 Jul - 1 Aug
3. Advisory services on strengthening of national food safety programmes	G. Moy	21 Oct - 9 Nov
4. Advisory services on marine pollution monitoring	J. O'Connor	3 Nov - 15 Dec
5. Conduct of a training course on environmental impact assessment	A. Brown & H. Ogawa	12-23 Nov
SOLOMON ISLANDS		
1. Advisory services on improvement of solid waste management in Honiara	H. Ogawa	1-15 Feb
TONGA		
1. Advisory services on improvement of solid waste management in Nuku'alofa	H. Ogawa	19-31 Jan
2. Field visit to discuss food safety	G. Moy	7-10 Apr
3. Field visit to assess collaborative activities in environmental health	P. Guo	16-20 Nov
TUVALU		
1. Field visit to discuss food safety	G. Moy	11-13 Apr
VANUATU		
1. Advisory services on relocation of solid wastelandfill site	H. Ogawa	4-11 Aug

Activity	Carried out by	Date
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VIET NAM

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| 1. Conduct of training courses on water quality monitoring and upgrading of water treatment plants | B. Fisher &
K. Waterhouse | 2-14 Sep |
| 2. Conduct of a workshop on health impact of industrial emissions | T. Kjellstrom
& L. Rosenstock | 8-19 Oct |
| 3. Conduct of a training course on practical aspects of environmental science and technology | B. Fisher &
H. Ogawa | 10-21 Dec |
| 4. Participation in a conference on development of a national environmental action plan | H. Ogawa | 3-6 Dec |

REGIONAL & OTHER MISCELLANEOUS ACTIVITIES

- | | | |
|---|---------------------------------------|-------------------|
| 1. Participation in the seventh session of the Codex Alimentarius Commission Regional Coordinating Committee for Asia, Chiang Mai, Thailand | G. Moy | 5-12 Feb |
| 2. Conduct of a regional workshop on municipal solid waste management, Kuala Lumpur, Malaysia | H. Ogawa,
K. Sakurai &
K. Sinha | 26 Feb -
2 Mar |
| 3. Participation in a UNDP meeting on environmental management and sustainable development in South Pacific Islands, Suva, Fiji | B. Fisher &
H. Ogawa | 17-21 Apr |
| 4. Participation in an ESCAP expert group meeting on the report of the state of the environment in Asia and the Pacific, Bangkok, Thailand | P. Guo | 30 Apr -
4 May |
| 5. Participation in the first session of the Codex Coordinating Committee for North America and the South-west Pacific, Honolulu, Hawaii | G. Moy | 30 Apr -
4 May |
| 6. Participation in the first meeting of the WHO Commission on health and the environment, Geneva, Switzerland | P. Guo | 19-21 Jun |

Activity	Carried out by	Date
7. Conduct of a regional seminar on food safety legislation, Kuala Lumpur, Malaysia	M. Jackson, D. Jayasuriya & G. Moy	27-30 Aug
8. Cosponsorship of and participation in First Asian conference on food safety, Kuala Lumpur, Malaysia	G. Moy	2-7 Sep
9. Participation in global consultation on safe water and sanitation for the 1990s, New Delhi, India	B. Fisher	10-14 Sep
10. Conduct of a regional workshop on health and technical aspects of nightsoil and wastewater use, Kuala Lumpur, Malaysia	B. Fisher, I. Hespanhol S.R. Niu & A. Saquer	24-28 Sep
11. Conduct of a regional working group meeting on water supply management, Kuala Lumpur, Malaysia	B. Fisher & K. Tomono	5-9 Nov
12. Conduct of a WHO/DANIDA food safety training course for the Pacific islands, Suva, Fiji	K. Leighton, Y. Motarjemi, N. Skovgaard & G. Moy	3-14 Dec
13. Participation in a Ministerial-level conference on environment and development in Asia and the Pacific, Bangkok, Thailand	P. Guo	10-16 Oct
14. Coordination of the UNEP/WHO Global Environmental Monitoring System (GEMS) air quality monitoring project	PEPAS staff	Continually
15. Coordination of the GEMS water quality monitoring project	PEPAS staff	Continually
16. Coordination of the GEMS food contamination monitoring project	PEPAS staff	Continually
17. Coordination of the GEMS human exposure assessment locations (HEAL) project	PEPAS staff	Continually
18. Environmental information service programme	PEPAS staff	Continually

APPLIED STUDIES INITIATED IN 1990**COMMUNITY WATER SUPPLY AND SANITATION****Study of the effect of water sealed toilets on groundwater quality in atolls, Federated States of Micronesia**

In many atolls in the Pacific, an increasing population has caused the construction of new latrines near the wells used as drinking water sources. This could pose a health hazard in cases where pollution from the latrines reach the wells. A study to analyse groundwater quality at varying distances and directions from a pour flush latrine is being implemented in Federated States of Micronesia. The results of the study will help develop guidelines for siting of latrines in relation to wells on atoll islands.

ENVIRONMENTAL HEALTH IN RURAL AND URBAN DEVELOPMENT AND HOUSING**Study on co-composting of municipal refuse and dewatered sewage sludge, China**

The study involves the development of procedures for refuse-screening and refuse-sludge mixing and optimum parameters in co-composting, establishment of dynamics models of decomposition and oxygen demand of organic matter, and economic evaluation of composting technology. The results of the study would be used to deal with urban environmental health problems arising from the increasing amount of municipal refuse and sludge from sewage treatment plants in China. In connection with the study, a technical guide for co-composting of refuse and sludge will be prepared.

Compilation of environmental planning guidelines, China

Integrated environmental planning is still at an infant stage in China. In order to guide environmental planners, a study is being conducted to develop guidelines for integrated environmental planning. The advantages of integrated environmental planning will be compiled, techniques will be described, and a case study will be conducted. A computer software for a large-scale system optimization routine through the case study, suitable for integrated urban environmental planning, will be developed.

CONTROL OF ENVIRONMENTAL HEALTH HAZARDS

Pilot study for fluorosis prevention, China

This study involves performing a Knowledge-Attitude-Behaviour-Practice (KABP) survey related to endemic fluorosis. The survey will document the knowledge among the people about causes of fluorosis and their customs and lifestyles. The objective is to find out the receptivity of rural people to change their lifestyles and customary practices to prevent high fluoride exposures.

FOOD SAFETY

Study on food safety: a risk factor for foodborne disease, Malaysia

This study, conducted in a rural area near Kota Bharu, examined the relationship between food handling and the risk of foodborne disease. The preliminary results indicate that poor food handling is a major cause of diarrhoeal and other foodborne diseases in rural areas. The study will lead to the development of intervention methods to minimize health risks.

Study to evaluate food safety risks at home, in dining halls and on the street, Viet Nam

An applied study is being implemented with the National Institute of Nutrition in Hanoi, Viet Nam to examine the hazards of foods consumed by students in their homes and at school cafeterias, and food sold on the streets. The study will include a Hazard Analysis Critical Control Point analysis of those foods associated with the risk of foodborne diseases.

Review of food safety legislation in the Western Pacific Region

A review of food safety legislation in the Region was undertaken by PEPAS. The review involved the collection and evaluation of information for the purpose of developing legislative models for possible adoption by Member States.

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LIST OF TECHNICAL DOCUMENTS ISSUED IN 1990

1. Reports on assignments and field visits

Reports are available on all activities listed in Annex 2.

2. Papers presented at regional workshop on municipal solid waste management

Guidelines for the formulation and implementation of national solid waste management action plans

Review of WHO (PEPAS) programmes on solid waste management

Investing in environment improvements through municipal solid waste management

The UNDP World Bank resource recovery/waste management programme

Case study for the formulation and implementation of the Malaysian ABC Plan

Case study for the formulation and implementation of the Korean national plan

3. Papers presented at regional seminar on food safety legislation

Overview of food safety legislation and issues in the Western Pacific Region

Model Food Act - general provisions

Model Food Act - importation, warranty and defenses

Model Food Act - regulations

Model Food Act - administration and enforcement - legal proceedings

Related legal Issues

Codex Alimentarius Commission

Food standards

Contaminants

Harmonization of food safety legislation

Information sharing

4. Papers presented at regional workshop on health and technical aspects of nightsoil and wastewater use

Health and technical aspects of wastewater use in agriculture and aquaculture

Overall design considerations and decision sequence for wastewater treatment

Guidelines for the safe use of wastewater and excreta in agriculture and aquaculture

Trends in wastewater and excreta use in agriculture and aquaculture

Design, operation and maintenance of wastewater stabilization ponds

Economic aspects of wastewater use

Development of biogas technology in excreta treatment in China

On-site sewage disposal systems in rural areas - a case study

Anaerobic and aerobic processes used in wastewater/excreta treatment for aquaculture in China

Compliance of different wastewater treatment systems with WHO guidelines for use in unrestricted irrigation

Control measures for the use of human wastes

Wastewater treatment and reuse - a case study

5. Papers presented at working group on water supply management

Overview of water supply in the Western Pacific Region

Modern trends on drinking water resource management and development

Water treatment plant upgrading

Technology transfer for water supply management

Human resources development for water supply management

Control of non- revenue earning water