



**Regional Workshop on Protecting Coastal and Marine Ecosystems  
from Land-Based Activities in the Asia-Pacific Region**

24 - 28 September 2001, Toyama, Japan

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UNITED NATIONS ENVIRONMENT PROGRAMME  
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**REGIONAL WORKSHOP ON PROTECTING COASTAL AND MARINE  
ECOSYSTEMS FROM LAND-BASED ACTIVITIES IN THE ASIA-PACIFIC REGION  
24-28 SEPTEMBER 2001, TOYAMA, JAPAN**

**1. PREFACE**

The Regional Workshop on Protecting Coastal and Marine Ecosystems from Land-Based Activities in the Asia-Pacific, held in Toyama, Japan, was a follow-up activity for the implementation of the Regional Programme of Action for the Protection of the Marine Environment of the East Asian Seas from the Effects of Land-based Activities. This workshop was the fourth in a series of regional consultative meetings on wastewater management. These meetings are jointly organised by the GPA Coordination Office and the Regional Coordinating Units of the UNEP Regional Seas Programme.

The organisers of this meeting, the UNEP East Asian Seas Regional Coordinating Unit, and the UNEP GPA Coordination Office, brought together representatives and experts from the countries of two regional seas, the East Asian Seas Action Plan (EAS) and the North West Pacific Action Plan (NOWPAP), covering a wide geographical area and many countries of both the northern and southern hemisphere.

Next to representatives from national governments, also other stakeholders, such as the private sector, NGO's and financial institutions were invited to attend the meeting. The List of Participants is attached as Annex I.

This non-conventional setting, and the large diversity in different aspects over this wider Asian region, gives challenging opportunities to share experiences and to explore new and innovative approaches in addressing wastewater and other sources of pollution.

The meeting was successful in this respect, as can be illustrated by the overall recommendation from the meeting, which recognises the importance to have a follow-up to this meeting by convening a steering group to further implement the GPA guidance across the wider Asia-Pacific Region.

The stimulating contributions of all the attendants of this 'inter-regional' consultative meeting are highly appreciated.

**2. BACKGROUND**

Sixty percent of the nearly 1.8 billion people inhabiting the East Asian Seas region are concentrated in coastal areas. In the past several decades, the region experienced high economic growth and rapidly increasing urbanisation. Problems of sanitation are most acute in urban areas and especially large cities. The rate of urbanisation varies from a high of 80 per cent for Australia to a low of 12 per cent in Cambodia. Singapore is entirely urbanised. Many of the 44 cities with populations over one million are located on the coast or estuarine areas of large rivers. Some megacities are experiencing rates of urbanisation of around 4 per cent per year.

Around 30 per cent of the world's coral reefs, one-third of the world's mangroves, as well as many other important critical habitats are found in the region. The region comprises the world's richest marine biodiversity and produces about 41 per cent of the total fish catch in the world. The state and the health of the marine environment are closely related to ecosystems and public health concerns and food security issues. The sustainable use of marine resources in many countries contributes significantly to the economy and the social wellbeing of the population. The income and nutrition of many people, particularly in developing countries, depend directly on the use of coastal and marine resources - fishing and tourism being obvious examples. Not surprisingly, the coastal communities derive most of their protein requirements from living marine resources, and depend on marine resources both directly or indirectly for employment and as a source of income. This includes burgeoning marine tourism that needs clean water and beaches, a rich marine life and attractive seascapes.

Pollution by sewage from domestic, industrial and commercial sources is of more concern than that from agricultural sources. Many of the uses of river water require water of a high standard; pollution by sewage in the region would therefore result in the need to find alternative sources. Its effects may be contamination of fisheries and aquaculture, the formation of red tides that kill fish and the enhancement of epiphytes and phytoplankton blooms, which smother underwater plants. The presence of untreated sewage and its impact on coastal and marine resources varies greatly and is complicated by numerous other factors. Water-borne diseases also result from sewage contamination of surface water and food. In many cities they have become endemic. In some cities, the discharge and seepage of untreated sewage into watercourses has seriously contaminated groundwater, which is drawn for domestic use.

Therefore, deteriorating environmental conditions around the world have more than ever focussed the attention of governments and the public on the environmental and health hazards of wastes. However, in many places wastes are still disposed of without particular care. In Asia, around 90 per cent of sewage is untreated and is discharged directly into freshwater bodies and the sea. Even in developed countries there is often insufficient disposal capacity to deal with the quantities of wastes generated.

Wastewater improperly discharged to freshwater and coastal environments presents a variety of concerns, such as: (a) pathogens; that may cause human health problems, (b) increase in suspended solids, (c) significant nutrient inputs, and (d) higher levels of biochemical oxygen demand (BOD).

According to the latest EAS/RCU Technical Report Series No.15 entitled "Overview of Impact of Sewage on the Marine Environment of East Asia: Social and Economic Opportunities", there are many problems encountered in the implementation of sewage management including inadequate waste management legislation and regulations, ineffective enforcement of regulations, insufficient or inadequate waste management facilities and services, and lack of skilled human resources and equipment in the public and private sectors. The fundamental requirements of an effective sewage management programme are a comprehensive set of legislation and well-endowed environmental institutions empowered by law. In general, there is no separate legal provision for dealing with sewage in all of the countries reviewed. The control of sewage pollution is covered under the overall environmental law or legislation governing water pollution.

As stated in the Recommendations for Decision-making on Municipal Wastewater (section 1.4 of UNEP/GPA/WGCAR.1/3), the costs to halt the pollution of water may seem prohibitive, but allowing pollution to continue causes damage and costs money. More and more evidence becomes available that pollution is associated with large, quantifiable direct costs to the existing economy and with even higher (missed) opportunity costs. It is recognised that there are innovative technical options such as on-site treatment plants coming into practice for treating sewage, which enable decision-makers to seek for the most cost-effective technique to minimise the treatment cost.

With financial support from the Government of Japan, the Northwest Pacific Region Environmental Cooperation Center and the UNEP GPA Co-ordination Office, the Regional Workshop on Protecting Coastal and Marine Ecosystems from Land-Based Activities in the Asia-Pacific Region was organised in Toyama, Japan, 24-28 September 2001. There were 29 government representatives from 11 countries from the regions of the East Asian Seas Action Plan and Northwest Pacific Action Plan. The participants came from governmental agencies, stakeholders and private sections that deal with sewage management.

The main objectives of the workshop were:

- I. discussing and agreeing on necessary regional arrangements for preparation of regional guidelines for control and treatment of sewage;
- II. assessing necessary information on innovative solutions on sewage control and treatment, and preparing regional guidelines on potential innovative solutions; and
- III. building partnerships in controlling sewage, including governments, stakeholders and private sectors.

### **3. OPENING OF THE WORKSHOP**

Mr. Masamitsu Oritani, Executive Director & Secretary-General Northwest Pacific Region Environmental Cooperation Center (NPEC) located in Toyama chaired the workshop.

On behalf of the Government of Japan, Mr. Noriyasu Yamada, Councillor, Minister's Secretariat, Ministry of the Environment, welcomed all participants from different countries in the Asia-Pacific Region. He expressed his gratitude to UNEP, the East Asian Seas Regional Coordinating Unit (EAS/RCU), the UNEP GPA Co-ordination Office, the Northwest Pacific Region Environmental Cooperation Center and the Toyama Prefecture for organising this beneficial workshop. He indicated that due to the remarkable population concentration, economic growth, and progress of urbanisation along the coastal areas of the Asia-Pacific region, polluted water from various sources of human activities is carried through rivers to the ocean, with resultant negative impacts on the coastal environment and human health.

On behalf of the citizens of the Toyama Prefecture, Mr. Yutaka Nakaoki, the Governor of the Toyama Prefecture welcomed all participants visiting the Prefecture. He informed the workshop that the Toyama Prefecture government is very interested in co-operation with other countries in the region to protect the marine environment. For this reason, the Northwest Pacific Region Environment Co-operation Center was established. He also informed the workshop that the Regional Co-ordinating Unit will be jointly established

in Toyama and Pusan, Korea. Governor Nakoki expressed deep gratitude to all participants and wished the participants a success workshop.

Dr. Cees van de Guchte, Senior Programme Office of the UNEP/GPA Coordinating Office welcomed, on behalf of UNEP, all participants attending the workshop, and thanked the governments of The Netherlands and Japan for their generous support and the government of Japan especially also for hosting the workshop. He reiterated the objectives of the workshop and emphasised its importance as a step towards finding solutions for land-based sources of pollution of the marine and coastal environment.

#### **4. SESSION 1. REGIONAL GUIDELINES AND STANDARDS FOR CONTROL AND TREATMENT OF SEWAGE AND OTHER EFFLUENT**

##### **4.1 Regional Overview of Impact of Sewage on the Marine Environment of East Asia**

Following the Opening Session, Dr. Chia Lin Sien, the UNEP consultant to the workshop, gave an overview of sewage and other effluent discharged into the marine environment. He provided some background information starting with the setting up of UNEP's Global Programme of Action (GPA) for the Protection of the Marine Environment from the Effects of Land-based Activities that was adopted by 109 countries in November 1995 in Washington, USA. A project involving seven countries on the Transboundary Diagnostic Analysis of Land-based Pollution for the South China Sea was then launched (Taluae-McManus, 2000). This led to the production of an overview on land-based sources and activities affecting the marine environment in the East Asian Seas (Chia and Kirkman, 2000), and a second overview focusing on the impact of sewage on the marine environment in the East Asian Seas and the social and economic opportunities provided (Chia, 2001). He gave an account of the biophysical environment of the waters in East Asia as well as the socio-economic situation of the region highlighting the trends towards urbanisation, tourist arrivals and the access to sanitation for selected countries in the region.

Dr. Chia also gave an account of the status of the provision of sanitation in the Southeast Asia region. Most major cities are still inadequately served by centralised sewerage systems, large proportions of urban dwellers are served by onsite systems and many poorer communities including squatter colonies have no proper sewage facilities at all. In some cases, lack of funds, worsened by the financial crisis that began in mid 1997, have resulted in existing sewerage facilities being shut down and maintenance severely curtailed. In most large and smaller sized cities, there are simply no sewage treatment facilities. He noted that there are exceptions among the more wealthy cities and that major efforts have been made to provide sewerage works and sewage treatment plants as in the cases of Korea, Malaysia, Thailand, and large cities in China.

##### **4.2 GPA Strategic Action Plan**

The UNEP GPA Coordinating Office with headquarters in The Hague was represented by Dr. Cees van de Guchte. During his presentation he pointed out that the provision of sanitation suffers from a lack of awareness, political will, long-term strategies, financial resources, capacities, and is hindered by institutional divides. There is an urgent need to tap domestic funding utilising the energies and resources of the private sector,

investment and developments banks. It is crucial for the countries to learn to develop private-public partnerships (PPP) and other alliances. Governments are urged to endorse guidelines for sewage management based on stepwise and integrated approaches and adopt appropriate institutional arrangements and financial mechanisms to facilitate the protection of the marine environment on a sustainable basis.

Dr. van de Guchte informed the workshop that the Toyama Workshop is the fourth in a series of regional GPA workshops. This will be followed soon by the GPA Intergovernmental Review Meeting in Montreal, Canada, in November 2001. He added that the Clearing House mechanism would cover information, data, news and sharing of experiences. There are currently 17 regional nodes and numerous management circles.

## **5. NATIONAL REPORTS ON SEWAGE DISCHARGE IN EAS AND NOWPAP MEMBER COUNTRIES**

Participants from all participating countries presented their respective national reports covering the three themes: (1) developing regional guidelines and standards for control and treatment of sewage, (2) exchanging views on innovative solutions, and (3) building partnership in controlling sewage: governments, stakeholders and the private sector. The national reports are attached in the annex II.

## **6. PRIORITIES OF THE REGIONAL WORKSHOP**

### **6.1 Developing Regional Guidelines and Standards for Control and Treatment of Sewage**

At the start of the second day of the Workshop, Dr Chia made a presentation of the background paper on "Developing regional guidelines and standards for control and treatment of sewage" (see Annex III-1). This was followed by a presentation by Dr. Anuphan (Thailand) on "Guidelines and standards and innovative solutions to sewage disposal: case of developing guidelines".

The discussion then focused on views on whether a set of regional guidelines is needed, what kind of guidelines and how to proceed towards developing them.

Dr. Nguyen Khac Kinh (Vietnam) was of the opinion that guidelines are useful on matters that deal with specific kinds of wastes and how to control and monitor them but he did not think that regional standards for the countries in the region should be set. Environment or ambient standards for say, marine and coastal waters, can be set up for the region, But there is no need for uniform effluent standards for all countries in the region. He stated that in setting up standards, it is important to know the self-purification capability of the aquatic systems. He also felt that setting up effluent standards is purely a technical problem and does not require consultation with the community.

Dr. Anuphan was of the opinion that we need co-operation with stakeholders in some cases and consultation would be an essential part of the process of adopting standards. He gave the example of the case of setting up gas station standards where the stakeholder felt that the standards were not practical. For BOD standards, some countries require taking moving seven-day average readings but in Thailand minimum standards are adopted.

Mr. Su Yibing, from China commented that general guidelines for the whole region are necessary and added that it should be decided on marine ecological targets first. He noted that the northern portion of the region is very different from warmer conditions to the south and hence the targets would naturally differ depending on the climatic regime.

Dr. Apichart (Thailand) thought that it was important to differentiate between national and regional standards. National guidelines and standards should be determined by the political economic situation of the country. But for the marine coastal environment, minimum water quality standards would be useful. For Thailand, public consultation is essential as this is required under the new Constitution. NGOs and stakeholders have been very active on environmental issues. Consultation will mean some delays but it has to be done.

Mr. Chrin (Cambodia) was of the opinion that a set of uniform standards on the coastal and marine environment are essentially, but each country should have its own effluent standards, however, Cambodia has the Sub-Decree on Water Pollution Control, including the Effluent Standards. Cambodia is in need of foreign investments and the imposition of stringent standards will discourage investors, reasonably will be posed consequences to the Royal Government Policy. Dr. Anuphan concurred that national standards are necessarily different from those of other countries, but the process and procedure for setting up standards can be a regional one.

Mr. Matsumiya from Japan commented that pollution-affected fish by toxic chemicals not treated in STPs, should be monitored. He mentioned the incident of dumping of nuclear wastes in the Japan Sea, reported in the media, as an example.

Mr. Geoff Bott (Australia) informed the meeting that there are eight States in Australia plus New Zealand. In spite of this, Australia and New Zealand have adopted standards for wetlands and riverine systems. He contends that it is possible to set up regional standards. It will require consultation with stakeholders. He added that, in Australia, some areas suffer from quite high salinity levels and it would be good to set future targets to anticipate the problem getting worse. The framework recognises pristine zones that Australia and New Zealand want to maintain on a long-term basis. These remain as guidelines not regulations. The guidelines reflect ISO14000 standards. He recognised the large variability across that region, for example, the tidal range. Guidance values for the Great Barrier Reef are much higher than areas where the water is coffee coloured due to the presence of natural vegetation. Some of the States are in the process of adopting discharge standards. These are judicial decisions that rightfully belong to the State. Finally, he noted the importance of determining the intention of use of the receiving waters.

Mr. Lee Chang-hee (Korea) I was in agreement that conceptually that there should be regional guidelines, but each country has to consider the practicality of implementing them considering the country situation, which can be difficult. He suggested clearly defined targets in the guidelines. He also noted the importance of deciding on national ocean boundaries, citing the cases of the East Sea (Japan Sea) and the Yellow Sea.

Mr. Jiang Yihang, Programme Officer, EAS/RCU, UNEP (Bangkok), summarised the discussion and the conclusion. There was general agreement that regional guidelines on sewage concentration to protect the marine environment, are necessary. However, the workshop noted that the guidelines should not be a legally binding document and should

serve as a reference to aid regional co-operation. Consideration should be given to differing ecological conditions across the wider East Asian region. Mr. Jiang added that capacity building is needed for the region. The discussion was positive and developing guidelines has to be a step-by-step process and needs to take into consideration the political background of countries in the region.

On the question of how to proceed toward a set of regional guidelines, Mr. Jiang proposed two options: (1) form a regional experts group to develop a draft guidelines, and (2) engage a consultant to undertake the task of writing up a draft guidelines. The whole process should be transparent. Dr. van de Guchte suggested engaging a consultant to work under the guidance of the UNEP Regional Co-ordinating Unit (RCU). The draft guidelines can then be discussed. Dr. Apichart opined that the RCU should form a regional drafting group, lay out the terms of reference, then let the consultant do the work. The issues here is the lack of political will. There should be a dialogue with policy makers.

Dr. Chia supported Dr. Apichart's suggestion of engaging regional experts familiar with the circumstances in East Asia. He also emphasised the need to take into account the work and function of the Association of South East Asian Nations (ASEAN) and also perhaps the Asia Pacific Economic Co-operation (APEC) forum that could assist the process of adopting the guidelines for the region. Mr. Bott felt that the guidelines should comprise a series of guidelines, such as an industry code.

Mr. Iswahydi (Indonesia) commented that guidelines do not constitute a legal document. They should include all the aspects of sewage management and should be used as a valuable reference for setting national standards. Mr. Makiya (Japan) was of the opinion that, generally, it is useful to have regional guidelines but it is important to prioritise what is most useful and urgent. Dr. van de Guchte said that the document should lay down details of financial and institutional arrangements and that technical operations and maintenance are already documented elsewhere (e.g. UNEP/IETC, Osaka, Japan) and easily available and are hence of lower priority. Mr. Jiang felt that the guidelines should also focus on planning and financial matters for better use by the participating countries. Dr. van de Guchte stated that a GPA document should lay down issues especially relating to sewage management. The starting point for the region should be to adopt a uniform set of environmental quality standards for the protection of the marine environment. There should be some kind of action plan to address the problem of land-based sources of pollution.

Mr. Jiang pointed out the need of a bridge to link national, regional and global guidelines. "We need guidelines that are practical and implementable", he said. The starting point would be to develop and adopt planning, financial and technical guidelines. Dr. van de Guchte referred to the question of environmental quality guidelines. At this point, Mr. Yosuke Matsumiya (Japan) informed the meeting that there is a centennial volume of the Japan Sewage Works Association giving accounts on how Japan developed its sewage systems. It is useful to know the historical evolution of the systems in different countries.

Returning to the discussion on guidelines, Ms. Leonor Cleofas (Philippines) argued for the need to tackle planning first. Mr. Uematsu (Japan) suggested that institutional arrangements should be a matter of high priority to implement projects and maintain facilities in accordance with regulations and standards.

The workshop agreed on the idea to develop regional guidelines on sewage treatment and management, taking into consideration the various elements discussed and agreed by the workshop, as indicated above.

The afternoon session began with a presentation by Mr. Geoff Bott who gave an account of experiences in Australia and New Zealand. They have adopted a set of 20 volumes of guidelines on various aspects of the management of sewage and, generally, land-based pollution (see [www.ncc.gov.au](http://www.ncc.gov.au)). The first of the guidelines deals with policies and implementation. He felt that guidelines should be adopted on the management of regional hot spots. On this, Dr. Jiang reported that there is an existing project to identify hot spots.

Dr. Chia mentioned that there are demonstration sites in the region that successfully tackled hotspots, e.g. Xiamen, China. Dr. Vicente Santiago (UNEP-IETC) felt that it was important to develop guidelines to prevent hot spots from emerging. Mr. Bott added that Australia also recognised 'warm spots'. He added that the problem with developing financial guidelines is that the context varies greatly, but he admitted that it is an aspect of great importance.

## **6.2 Innovative Solutions on Sewage Management**

The previous session continued with a presentation by Mr. Matsumiya (Japan) on the use of innovative solutions in the Tokyo Metropolitan area.

This was followed by a presentation by Dr. Aminnudin (Malaysia) on Malaysia's experience with onsite systems. He was questioned on why Malaysia does not use oxidation ponds that are cheap to build and operate as well as being quite effective. He replied that Malaysia is concerned with maintaining its effluent standards and that there have been uncontrolled constructions of such systems that do not meet standards. He was asked how Malaysia deals with the problem of the disposal of sludge. He replied that sludge is manually removed. Tankers are used to desludge onsite systems and the contents sent elsewhere for treatment in larger systems. He also informed the meeting that industrial plants are not allowed to be connected to the sewerage systems except on a case by case basis. If they were they would pay a slightly higher tariff.

To start up the discussion on innovative solutions of sewage management, Dr. Chia presented the second Background Paper on the topic (see Annex III-2). This was followed by a presentation by Mr. John Neate, consultant to UNEP-IETC. He reported that the Center has a major programme focused on water for cities. It produces useful source books, guide books, and training manuals. The objective is to influence decision-makers to take necessary actions. Preparations are being made to host the next International Water Association meeting. World Water Forum III will be held in Japan in 2003.

Dr. Santiago also from IETC followed the presentation and gave presentation of the Center's work on watershed management for river basins. He reported on their method of using plants to increasing the capacity of the ecosystem to absorb pollutants. IETC works with UNESCO in developing techniques based on eco-hydrology. The approach adopted is not only based on hardware but also employs ecological methods. IETC also promotes public awareness and undertakes work on the management of lakes and islands. The Center has the

capacity of developing and offering knowledge bases. He pointed to their website [[www.ietc.unep.or.jp](http://www.ietc.unep.or.jp)] for free downloadable material.

The afternoon session continued with a presentation of the Johkasou System by Dr. Yang Xinmi (Japan). – He presented a detailed technical account on the operation and function of the system. He also mentioned that this system has been transferred to Indonesia, and a case study is proceeding as an international co-operation program in Cirebon City. Dr. Chia followed by giving a list of innovative solutions. The various options were discussed and more options were added.

Mr. Uematsu (Japan) mentioned that a cost-benefit evaluation is essential for selection of sanitation facilities such as off-site and on-site sanitation, considering the social/economic background, required standards and so on.

Mr. Allen Gale (Australia) spoke on privatisation. He noted that, in the case of Australia, the State water authorities were corporatised not privatised. The corporation pays 4 per cent dividends to the government valued at several hundreds of millions of dollars. He remarked that privatisation involves a sharing of costs as well as risks. It is important to decide on how many assets should be given over to private enterprise. He believed that the highest risk lies in collection of tariffs and that “over innovation” should be avoided because of the risks involved. The perceived problem of basic services being taken over by foreign companies did not become a reality. Many foreign companies were established in Australia and are working closely with the government. He added that while privatisation did not result in a reduction of tariffs, there was reduced increment in charges. He concluded that there is now a mature relationship among government, the private sector and the community.

The workshop felt that in order to reach better sewage management systems, it was important to discover innovative solutions that are technically feasible for appropriate application. From the presentation provided to the workshop, it was recognised that innovative solutions were case-specific from one country to another. However, the workshop was impressed by the successful examples presented.

### **6.3 Building Partnerships in Controlling Sewage: Governments, Stakeholders and Private Sectors**

Mr. Su presented to the workshop China’s current environmental protection programme and more particularly its provision of sanitation. He started by referring to the opening up of China’s market and the country’s imminent entry into the World Trade Organisation (WTO). The installation of sewage treatment plants was only a part of the programme China had committed to undertake. The problem remains on how to control industrial pollution. China was also committed to opening up the environmental protection market, hence allowing the private sectors to be involved in the construction, operation and maintenance of sewerage works and wastewater treatment plants (WTP). He cited the example of a British firm involved in building, operating and transferring a WTP. Other examples are the Fujitsu Company, which has indicated interest while Korea started a research institute on environmental pollution control in Beijing. A Japanese organisation brought equipment to treat Taihu Lake to improve its water quality. China can no longer take the approach of development first then clean up the environment later. As early as 1973, requirements for environmental protection were already being adopted. Today, it is

mandatory for new industries to install wastewater treatment facilities. For smaller cities, according to population size, centralised sewage treatment plants have been planned. Every city mayor must submit plans to carry out such developments.

A presentation by Dr. van de Guchte provided an overview of the situation relating to municipal wastewater issues under GPA using the Guidance Document (available separately).

Dr. Chia then made his presentation on building partnerships among government, the private sector and the community (see Background Paper 3 as Annex III-3).

During the discussion, the workshop different views on this matter were discussed. Mr. Uematsu (Japan) emphasized the importance of government responsibility in developing appropriate sanitation. Government is expected to not only set and enforce regulations and standards but also provide subsidies for implementing agencies. Incentives were provided and difficulties arising from the Asian financial crisis were addressed. Australia uses incentive schemes to encourage States in the country to comply with the guidelines. Under the Australian Federal system, the requirement to provide sanitation lies with the state governments. The central government encourages the provision of sanitation using financial incentives as leverage.

Dr. Aminuddin (Malaysia) gave a brief account of Malaysia's privatisation scheme that produced partial success in the technical area but the scheme failed and the Federal Government had to acquire the concessionaire, Indah Water Konsortium (IWK). The scheme had the beneficial effect of uplifting the standard of sanitation in the country. The concessionaire being a private operator, and also numerous private developers and contractors of sewerage systems came under adequate control of the Federal Government compared with the previous situation when sanitation came under the control of each Local Government.

Mr. Matsumiya (Japan) reported that, in the case of Tokyo Metropolitan Government, the private sector would be unwilling to take over the huge debt of US\$25 billion needed to pay back while controlling the operation of the metropolitan sewerage system and sewage treatment facilities. Some 70 per cent of the capital cost was covered by the sale of bonds. The remaining costs were paid for under the general tax revenue while a sizable proportion of the costs were met by subsidy. Each year, negotiations with the Ministry of Land, Infrastructure, and Transportation for allocation of funds, has to be carried out.

Mr. de Guzman informed in the meeting that, in the case of the Philippines, the sewerage and sanitation services are supported by the revenues from water supply operations considering the low tariff being collected for the services. Under the Concession Agreement, the government through its private concessionaires will expand the sewerage system of its respective areas particularly in Metro Manila. However, public acceptance to connect to sewer is a great difficulty due to the lack of political will by the government to implement the law, and the difference in tariff from those connected to sewers and those being served by individual household septic tanks. Those connected to sewers are being charged 50 % of the water bill while those using septic tanks are levied a 10 % environmental charge.

Dr. Apichart said that if the government is not willing to find a way to collect fees, it will be extremely difficult to make privatisation a success. Dr. Anuphan added that, in Thailand, there are 58 sewage treatment plants (STPs) in operation, and an additional 23 facilities are currently under construction representing an investment by government that totals 63 billion Thai Baht. After the plants are completed, they will be transferred to local authorities to take over the responsibility of operation and maintenance. However, they need the necessary financial resources and technical capability to operate them. He is of the opinion that consideration should be given to affordability the people and that privatisation of sewerage schemes should be carefully scrutinised. Privatisation may be useful to enhance sewage treatment and management, but care should be taken before doing so. He added that there is a general requirement for the necessary facilities to treat the high levels of salinity in the wastewater.

Ms. Cleofas commented that there is a need for partnership rather than privatisation only. In Metro Manila, 10 per cent of households are connected to sewerage. By the year, 2003, those who are connected will be charged 150% of the water bill and those who are not connected will be charged 75% of the water bill as environmental charge."

In the case of Indonesia, the meeting was informed that all of the systems are under the government and recently they came under the responsibility of the local government. In the case of the Bandung sewerage scheme, there is a loan from the Asian Development Bank (ADB). Most local authorities encounter difficulties in operating and maintaining the wastewater treatment plants. The work involved is mainly limited to desludging of septic tanks and is undertaken by private operators. There are global positioning systems (GPS) units placed on the tankers. Receipts are given to match the records of sewage treatment facilities receiving the sludge. The government employs, as an incentive, a lottery system to encourage the appropriate disposal of sludge and several operators have been prosecuted for irregular practices.

On the issue of privatisation, Mr. Ahmad Rozian (Malaysia) felt that there is a need to carry out feasibility studies on the privatisation scheme. In the case of IWK, the company grossly underestimated the number of treatment plants to be taken over. They estimated a total of 1,000 plants when the actually number came to some 8,000 plants that needed to be serviced. None of the banks approached wanted to finance the project. The government had to subsidise the scheme continually as a result of an absence of a feasibility study prior to the implementation of the scheme. Not only are households unwilling to pay for services provided, many commercial enterprises also refused to pay. Worse still, political parties did not support the scheme. He added that, over the last two years, the government engaged Price Waterhouse to recommend appropriate tariffs. The study is completed but the findings have not been made public. Commenting on privatisation of sanitation schemes, Mr. Fujiki stated that it is necessary to subsidise sewerage projects. In order to share the cost burden, charges based on the water user-pays and polluter-pays principle should be followed.

In the afternoon session, Dr. Chia presented a revised list of recommendations agreed upon by the meeting on adopting innovative solutions to managing sanitation and the meeting continued to develop a list of recommendations on partnerships. Detailed information was provided in the item specified as "Special Remarks", Recommendations for Adoption in the Guidelines. At this point of the meeting, Dr. van de Guchte informed the meeting on future developments of the GPA programme. He said that GPA will continue to pursue the

adoption of both binding and non-binding agreements on water quality standards for each region, sub-region and eventually for the world as a whole. He emphasised the need to identify critical issues for the East Asia region that can be brought before the inter-governmental meeting in Montreal.

The workshop realised that even though there are some examples of privatisation of sewage systems in the wider East Asian Seas region, great care must be taken to achieve effective implementation. These innovative approaches are worth-wile to consider, though. It was further noted that building partnerships among relevant governmental agencies, stakeholders and private sectors would give good alternative solutions.

## **7. REPORTS ON PARALLEL SESSIONS**

For the rest of the afternoon, the delegates were divided into two groups meeting in parallel sessions, participants from the East Asian Seas Action Plan and those from the Northwest Pacific Action Plan, to consider recommendations to address specific requirements for and actions to be taken in the respective regions.

The two meetings were chaired by Mr. Lee Chang-Hee (Korea) and Dr. Apichart Anukularmphai (Thailand), respectively.

### **7.1 Report on EAS Session**

The East Asian Seas meeting comprising participants from Australia, Cambodia, China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam met to develop recommendations for UNEP to facilitate work toward closer co-operation among member countries in the region.

The EAS group recommended setting up an Interim Committee for the region. In order to link the group, it was proposed that an electronic website be set up and housed in the office of the EAS/RCU of UNEP in Bangkok. The objective of this network was to facilitate the dissemination and exchange of information relating to land-based pollution of the marine and coastal and related environments with special reference to sewage management.

A number of delegates at the meeting volunteered to be members of the Interim Committee, which will act as the focal point of his/her country. They were Mr. Geoff Bott (Australia), Mr. Chrin Sokha (Cambodia), Ms. Xiaojuan Shi (China), Ms. Leonor C. Cleofas (Philippines), and Dr. Chia Lin Sien (Singapore). The remaining delegates requested that UNEP sends a letter to their respective governments to appoint a member to the Interim Committee. Consistent with this matter, all delegates already back in their countries also should report to their leaders the request to nominate a focal point to the UNEP Secretariat in Bangkok, if have not existed a focal point towards this issue yet. For Cambodia, Indonesia, Malaysia, Thailand and Viet Nam the letter should be sent to the respective UNEP focal points copied to the participants at this meeting.

The EAS meeting then proceeded to discuss preliminary pilot projects. A number of projects with tentative topics were put forward:

- Australia:** Filtration and disinfection of septic tank effluent.
- Cambodia:** Demonstration sites for technologies for the collection, treatment and disposal of domestic and industrial wastewater.
- Indonesia:** Development of appropriate technologies for the treatment of wastewater from fisheries villages.
- Singapore:** Assessing manpower and training requirements for the management and maintenance of sewerage works and sewage treatment plants in East Asian countries.
- Thailand:** Design and construction of appropriate on-site treatment facilities in resort areas.
- Viet Nam:** Capacity building for communities for sewage management in the coastal municipalities in Viet Nam.

**Remarks:** Dr. van de Guchte informed the meeting that member countries may submit their projects later via the Regional Seas Co-ordinating Units and a decision will be made when availability of funds becomes clear. The scope and criteria for selection will be provided by the GPA Office. For the exchange of ideas on technologies for the control of sewage, pilot projects are being undertaken in the Philippines, results will be made available to other member countries in the region. It was noted that Australia could provide assistance for the appraisals of the proposed projects.

## 7.2 Report on NOWPAP Session

The NOWPAP meeting was chaired by Mr. Lee Chang-Hee (Korea) with the attendance of the participants from China, Japan and Korea. The meeting recognised the following:

- The need to use existing NOWPAP mechanisms to address regional seas problems including the problem of sewage management.
- On specific issues in the NOWPAP region, the meeting agreed on the following:
  - That nutrient overloading from point sources and non-point sources is a major problem.
  - There is an urgent need to implement nutrient reduction measures including sewage management.
  - Recommended the development of regional guidelines for phased nutrient reduction as a first step toward addressing the problem of point sources of sewage pollution of the marine and coastal environment.
- That the guidelines should deal with economically feasible treatment technologies, best management practices for nutrient control, upgrading existing sewage treatment plants and feasible financing mechanisms to implement nutrient reduction measures.
- That the participation of DPR Korea and Russia is essential to address regional seas problems and to implement appropriate measures to mitigate the problems.

- Pilot projects could include:
  - Research on the acceptable level of nutrients based on the carrying capacity of regional seas.
  - Development of financially feasible alternative technologies and nutrient reduction measures to minimise nutrient loading.
  - Development of feasible financing mechanisms for implementing nutrient reduction measures.

## **8. FINAL REMARKS**

The national reports were generally of high quality. They were rich in information and provide many lessons. Australia is in an advanced stage of provision of sanitation and there is a mature relationship among government, the private sector and the community. Both Malaysia and the Philippines presented valuable insights on the process of privatisation and the pitfalls in adopting such schemes. The high priority placed on the provision of sanitation on the part of China, Korea, Malaysia and Thailand are worthy of note. Korea has sanitation facilities that come close to that of Japan. For countries such as Cambodia, Viet Nam and Indonesia troubled by the economic crisis there is still much to do to improve sanitation for their population.

During discussion in the question and answer periods, the workshop paid much attention to the difficulties encountered by the privatised schemes adopted in Malaysia and the Philippines. Malaysia presented an interesting experience of modified onsite schemes especially the Imhoff system. Financing the construction of sewerage works and the cost of operation and maintenance remains the most urgent problems while the need for capacity building including the training of technical and management personnel constitutes major difficulties encountered in a number of the countries.

The East Asian region needs to agree on adopting a set of regional guidelines although water quality standards and performance requirements should stay with the individual national governments. Regional guidelines can contribute to enhance regional co-operation in managing land-based pollution. The two Regional Seas Programmes, East Asian Seas Action Plan and Northwest Pacific Action Plan, should identify and adopt innovative solutions to help move toward more effective management of sewage.

Focussing on the need to develop regional guidelines, Dr. van de Guchte brought to the attention of the meeting the forthcoming Intergovernmental Review (IGR) Meeting to be held in November 2001 in Montreal. The meeting will have country representatives and major stakeholders as well as decision-makers. Just prior to the IGR meeting, there will be a Regional Seas Programmes meeting. Several key documents are being prepared for the IGR meeting. Some of these documents have been made available to the participants at this workshop. The goal is to eventually adopt the process followed to derive global guidance for sewage management. One of the outputs of the Montreal meeting will be a ministerial Declaration, in co-operation with other UN organisations, partner organisations, coastal area management organisations, non-governmental organisations and others. On the part of this workshop, there was a need to set priorities for the region and to make recommendations on the harmonisation of global guidance.

## 9. RECOMMENDATIONS

A drafting group was formed with chairman from Australia. Members of this group were China, Japan, Malaysia and the Philippines. The tasks were to prepare recommendations for future activities of the GPA in the East Asian region on the themes of the Workshop:

- Future activities in developing regional guidelines,
- Innovative solutions, and
- Building partnerships.

The Drafting Group welcomed other participants who were interested in the discussion and outcomes. The above mentioned reports were discussed at the closing general session and adopted.

### **Recommendations of the Workshop**

Member countries recognise the importance of further discussion on the three themes of the workshop and the need to provide institutional and administrative arrangements, such as the Steering Group, in order to promote these across the wider East Asian region.

That a Joint NOWPAP/EAS Steering Group be convened to further implement the GPA within the broader East Asian Region and to recommend mechanisms and actions for this purpose.

#### **General**

- The Steering Group be established with all member countries being invited to nominate a representative.
- UNEP to facilitate establishment of the Steering Group and to assist development of a draft Terms of Reference based upon directions from the Workshop.
- The Steering Group is to determine the need for external support and work closely with external support, as appropriate.

#### **Regional Guidelines**

- The Steering Group, building upon Background Paper No.1, is to develop regional guidelines [framework] consistent with the GPA to address specific issues needs priorities in the NOWPAP and EAS regions.
- The Regional Guidelines should not be standards [regulatory instruments], but rather provide a framework for the identification of values, goals, objectives, targets and criteria, consistent with the objectives of the GPA.
- Noting that regulatory measures are matters of consideration for member countries and are specific to the institutional and statutory arrangements of those countries.
- Each country be requested to identify roles, responsibilities and instruments for implementing the regional framework.

### **Innovative Technologies**

- The Steering Group, building upon Background Paper No.2, is to facilitate the identification, selection, use, and application of technical practices in wastewater management within the context of the GPA.
- The Steering Group is to manage identification and distribution of information on innovative technologies and practices. UNEP-DTIE-IETC will assist in the identification and provision of relevant information on environmentally sound technologies [ESTs].
- Noting that technical innovation shall include matters relating to collection, treatment, disposal, reuse, biosolids, energy and water efficiency and alternative environmentally sound technologies and practices.
- The Steering Group is to facilitate the development of pilot projects for the purposes of demonstrating innovative technologies within the region, consistent with the purposes of the GPA. Pilot projects are to provide for community involvement, institutional arrangements, technical innovation and marine protection from land-based pollution [generally].

### **Partnerships**

The Steering Group, building upon Background Paper No.3, is to develop further partnership approaches across levels of national, state and local government, industry and the community to further implementation of the GPA within the region.

Partnerships to include capacity building, particularly those relating to the promotion of public awareness, education and participation, consistent with the purposes of the GPA and the outcomes of this Workshop.

## **10. CLOSURE OF THE WORKSHOP**

At the start of the day's session, Dr. Chia presented the draft reports of the sub-regional groups' meeting as well as the draft recommendations of the drafting group for adoption.

At the closing ceremony, Dr. Chia gave a brief summary of the proceedings of the workshop. Mr. Jiang then informed the workshop about the publication of the report and proceedings. The draft report will be prepared by UNEP and circulated to the participants for comments before finalisation and printing. The draft report will be presented to the Intergovernmental Review Meeting, by the GPA Co-ordination Office and the Co-ordinator of EAS/RCU.

On behalf of all participants, Dr. van de Guchte thanked the Chairman of the workshop, and all participants for their hard work and valuable contribution to the workshop, which ensured its success. The chairman then closed the regional meeting on the afternoon of the 28<sup>th</sup> of September 2001.