



UNITED NATIONS ENVIRONMENT PROGRAMME



REGIONAL OFFICE FOR ASIA AND THE PACIFIC

## ENVIRONMENTAL TRAINING AT TERTIARY LEVEL IN THE ASIA-PACIFIC REGION

Report of the Regional Consultative Meeting  
on Environmental Training at Tertiary Level  
in Asia and the Pacific

Bangkok, Thailand

December 13-14, 1993

NETWORK FOR ENVIRONMENTAL TRAINING  
AT TERTIARY LEVEL IN ASIA AND THE PACIFIC  
(NETTLAP)

NETTLAP PUBLICATION No. 8

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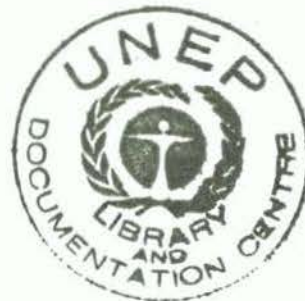
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## INTRODUCTION

1. A regional meeting of experts held in Bangkok in 1985 (UNEP, 1986) formulated a programme of action for environmental education and training in Asia and the Pacific. The development of tertiary level curricula on topical environmental issues was seen as a priority activity. In recognition of the need for greater collaboration and interaction in environmental education in Asia and the Pacific, the meeting also recommended the establishment a regional network for environmental education and training to: i) exchange information on courses, training programmes and research activities; ii) facilitate the exchange of experts; and iii) serve as an advisory group for environmental education in Asia and the Pacific region. Priority projects were to be in the areas of: a) information exchange; b) environmental economics; c) coastal zone management; d) toxic chemicals and hazardous processes and wastes; and e) acid rain.

2. United Nations Environment Programme (UNEP) provided catalytic support for the *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*. With continuing support from UNEP, NETTLAP has subsequently been strengthened and expanded in response to the recommendation in Agenda 21 that there be increased *support (of) university and other tertiary activities and networks for environmental and development education* and the observation in Agenda 21 that *there is a need to strengthen, within five years, information exchange by enhancing technologies and capacities necessary to promote environment and development education and public awareness*.

3. NETTLAP focuses on human resources development and institutional strengthening. These are recognized, in Agenda 21 and elsewhere, as two of the key strategies in the capacity building required to equip developing countries with the ability to pursue their goals of social and economic development while at the same time protecting the environment and conserving natural resources.

4. In the past 12 months NETTLAP's operational network has grown rapidly. It was launched with the identification of National Focal Points (NFPs). These have responsibility for policy, major procedural decisions and financial resourcing at the national level. The strengths of the network are its institutional and individual members. These are supported at the regional level by Thematic Network Coordinators and at the national level by Specialist Focal Points, both related to the three themes of NETTLAP:

- coastal zone management;
- environmental economics; and

- toxic chemicals and hazardous wastes.

5. On December 13, 1993, UNEP convened a regional meeting in order to obtain the views of governments, of both developing and developed countries in the region, on the evolution of the project, consistent with Agenda 21. The intention was to determine what these countries seek to gain from regional activities related to the environmental training of staff from tertiary institutions and to identify the support the countries might wish to provide to ensure the effectiveness of such activities.

6. The meeting was also to identify and elaborate approaches to the strengthening of tertiary institutions with regard to environmental education and training. The primary focus was on human resources development, and specifically enhancing the environmental knowledge and skills of teaching staff from those institutions in order to better address national concerns related to environment and development. This is consistent with the recommendations of Agenda 21. UNEP was keen to use the meeting as a forum in which to catalyse intergovernmental and interagency collaboration at the regional level and to determine ways in which NETTLAP can be used to facilitate such cooperation, to the benefit of tertiary institutions and their staff in the region.

## **ORGANIZATIONAL MATTERS**

### **Attendance**

7. The Regional Consultative Meeting on Environmental Training at Tertiary Level in Asia-Pacific was held in Bangkok, Thailand from 13-14 December 1993. The meeting was attended by NETTLAP National Focal Points (or their alternate) from 11 countries, representatives from ESCAP, UNESCO-PROAP, UNESCO-ROSTSEA, UNDP and WHO, as well as by representatives from the three thematic networks of NETTLAP. The Agenda of the Meeting is in Annex I and the list of participants is in Annex II.

### **Opening of the Meeting**

8. The meeting was opened by Dr. Reza Amini, Coordinator of the Regional Coordination Unit for the East Asian Seas Action Plan. In his opening address, Dr Amini outlined the historical context for the evolution of the Network for Environmental Training, at Tertiary Level in Asia-Pacific (NETTLAP). It commenced as a UNEP project in September, 1992. The network was borne out of the urgency to effectively address the thematic issues on which environmental education should focus, as identified by the Experts' Meeting held in 1985 in Thailand. The recommended themes included environmental economics, coastal zone management, and toxic chemicals and hazardous wastes.

9. Just over twelve months since the inception of the project, NETTLAP has established an effective region-wide infrastructure for information exchange and coordination of country-level activities in environmental training at tertiary level. The present meeting was convened to evaluate NETTLAP'S current initiatives, within the broader context of environmental education and training as a major strategy towards sustainable development in Asia-Pacific. Dr. Amini further stressed that identification of needs, and resources which

should be mobilized to fill in such requirements, must be undertaken by NETTLAP's member countries. He looked forward to the identification of regional and subregional activities which can strengthen the capabilities of tertiary level institutions in implementing an effective environmental training program. Dr Amini concluded his opening address by warmly welcoming the participants to Thailand.

### **Election of Officers**

10. The meeting elected the following officers:

Chairperson	Ms. Amelia Dulce D. Supetran	(Philippines)
Vice-Chairman	Mr. G.V. Subrahmanyam	(India)
Rapporteur	Mr. Kuk Hyun Chung	(Korea)

### **Adoption of the Agenda**

11. The provisional agenda was adopted with an amendment for the NETTLAP Coordinator, Dr. John Hay, to provide an overview of the needs for environmental training at the tertiary level in Asia-Pacific.

12. Dr. Hay introduced two documents which had been distributed to participants in advance of the Meeting (Annexes III and IV). He emphasized the distinction between environmental education and training - the former establishes sensitivity to environmental problems, raising the awareness and generating commitment while the latter is for the development and mastering of skills, for the solution of practical problems and for specialized action. Within the Asia-Pacific region, with over half of the world's population and an extremely high diversity of cultural, economic, social and political conditions, the needs for environmental training are equally varied. However, almost all of the 59 countries in the region have some form of environmental training or education through the incorporation of environmental topics in existing curricular or through specific courses or degree or programs, at undergraduate and/or graduate level.

13. Among the most pressing needs related to tertiary level environmental training in the region are the dearth of trainers with even the most rudimentary formal training in education theory and practice, the inaccessibility of relevant resource materials and information, and the discipline-based orientation of teaching about interdisciplinary and multi-sectoral based issues and response strategies.

## **SUBSTANTIVE MATTERS**

### **Regional Initiatives**

14. As the major funding agency of the United Nations system, UNDP has incorporated the environment as an integral part of project design for all of its activities.

With respect to NETTLAP, Ms Ricarda Rieger, the UNDP Deputy Regional Representative, suggested that the Network make use of the database on Technical Cooperation in Developing Countries. It includes an inventory of existing training infrastructure and facilities.

15. Mrs Lucille Gregorio, of UNESCO's Principal Regional Office for Asia and the Pacific (PROAP), provided the historical background to cooperation and networking for environmental education and training in Asia and the Pacific (Annex V). She also described the UNESCO follow-up to UNCED and Agenda 21, especially in terms of education, public awareness and training. Mrs Gregorio also provided details on several of the regional networks which give prominence to environmental education and several publications which are relevant to the topics of environmental education and training.

16. The representative of UNESCO's Regional Office for Science and Technology in Southeast Asia, Mr M. Hashizume, stressed the need for the reorientation of all levels of education towards sustainable development. NETTLAP may draw on the resources of UNESCO-ROSTSEA when designing training programs appropriate to trainers at the tertiary level.

17. Mr Bishnu Pant of ESCAP pointed out that the Inter-Agency Committee on the Environment and Development for Asia and the Pacific is a useful forum for cooperation within the UN system and with external organizations. ESCAP is the Committee's Secretariat and UNEP is a member agency. This Committee may be a major support for the NETTLAP project, in terms of resources, expertise and infrastructure. In addition, ESCAP has several relevant networks of institutions. Themes include desertification, environment and economic policy, and the marine environment and oceanographic studies. A network on climate change is currently under development. ESCAP has also developed a manual on how to collect relevant data on environmental parameters which may later be developed into environmental indicators. These procedures may be useful material for inclusion in the training programmes of NETTLAP.

18. As environmental health is a major thrust of WHO, Dr Han Tun, WHO Liaison Officer with ESCAP, suggested that there is considerable opportunity for cooperation between that organization and NETTLAP, especially through the latter's thematic network on Toxic Chemicals and Hazardous Wastes.

### **National Activities**

19. The representative of the P.R. China, Ms Zou Jing, noted that her country attaches great importance to environmental protection. Much emphasis is placed on the dissemination of information to promote environmental awareness. There are more than 100 universities and colleges which have programmes related to the environmental sciences. The National Environmental Protection Agency and the State Education Commission often collaborate to hold short term training courses for teachers from middle schools and for principals from primary and middle schools (Annex VI).

20. In Hong Kong there is a total of nine tertiary institutions offering environment-related courses. The representative of Hong Kong, Mr Wallace Cheung, reported that, in addition to academic courses, these institutions often organize conferences, seminars,



technical meetings and short courses. So too do the learned and professional societies and the Environmental Protection Department. Additional information on tertiary training activities in Hong Kong is presented in Annex VII.

21. Dr G.V. Subrahmanyam of the Indian Ministry of Environment and Forests informed the meeting that the Government of India accords priority to the promotion of environmental education, training and awareness raising among all sectors of society. He went on to describe the initiatives which have been taken in topics related to the themes of NETTLAP - see Annex VIII.

22. In Indonesia the Environmental Study Centres, based in tertiary institutions, provide important support for environmental management. They were established to provide technical expertise for research, training and extension services in all aspects of environmental matters at the national and regional levels. Within tertiary institutions in Indonesia there are no undergraduate degree programmes in environmental science or environmental management. At this level environmental matters are mostly taught as an integral part of the existing curriculum. At the graduate level, degree programmes in environmental science are offered by two universities. Other universities have postgraduate programmes in natural resource and environmental management and in development. More details are provided in a comprehensive paper submitted by Professor Soerjani of Indonesia (Annex IX).

23. Dr Mitsuru Yamamura of the Environment Agency of Japan reported that to date in Japan, environmental education in universities has been undertaken mostly in physical and applied science departments such as engineering, agriculture, and the physical sciences. Recently there has been increasing focus on global environmental issues and on policy development. This is extending environmental education and training to include the social sciences (Annex X).

24. The representative of the Republic of Korea, Mr Kuk Hyun Chung, from the Training Institute for Environmental Education, noted that his country is confronted with many environmental problems. Most are related to the rapid growth of the Korean economy. There is now a national consensus that environment must no longer be sacrificed for economic development. Thus environmental education and training are of increasing importance. In this respect, cooperation at the regional level is vital (Annex XI).

25. Dr M.B. Awang of the Universiti Pertanian Malaysia described the last two decades in Malaysia, during which universities have achieved a very strong and high standard of environmental education and training, partly as a result on inter-institutional, and intra- and inter-regional linkages established between educational institutions and organizations. Universities in Malaysia offer both formal and non-formal environmental education courses to students pursuing diverse educational programmes. He presented a comprehensive review of these programmes, placing special emphasis on the three themes of NETTLAP (Annex XII).

26. The Government of Nepal has recently adopted policies and implemented an action plan to address environmental problems facing the country. The latter include deforestation and soil erosion. The action plan includes a component on human resources

development, which addresses public awareness, education and training. Dr Uday Sharma of the Ministry of Forests and Soil Conservation indicated that the needs of Nepal with respect to environmental training include: i) environmental economics (including cost benefit analysis of indirect environmental impacts); ii) environmental impact analysis; iii) the development of environmental management plans, iv) development of instructional materials; and v) development of communication skills. There is an overriding need for programmes which train the trainers.

27. Ms Amelia Supetran of the Environmental Education and Information Division of the Department of Environment and Natural Resources described the comprehensive national programme developed by the Philippines for tertiary education and specialist training. This involves curriculum and materials development, research, various training activities, a scholarship programme and a programme for facilities and equipment upgrading. Further details are provided in Annex XIII.

28. In Singapore the Ministry of Education oversees the various educational programmes offered by the two universities, the four polytechnics and the Institute of Technical Education. Dr Andy Hor of the National University of Singapore noted that the programmes in these and other educational institutions in his country place considerable emphasis on such topics as the planning of a green city, the origins of air pollution and its control, domestic refuse disposal and planning, toxic waste assessment and management, coastal zone management, environmental economics and water conservation, purification and treatment. These programmes are described in greater detail in Annex XIV.

29. Environmental training at tertiary level in Thailand includes academic training of environmental professionals. Most universities offer bachelor and master degree programmes and a few offer doctoral programmes related to the environment. The representative of Thailand, Dr Suphavit Piamphongsant of the Office of Environmental Policy and Planning, also described the short term training courses which address specific themes. While some universities offer such courses, much of the activity is now focussed on the Environment Research and Training Center of the Department of Environmental Quality Promotion. It is envisaged that this Centre will offer 25 short term training courses each year, with the involvement of tertiary institutions. Topics covered include environmental management, natural resources, environmental technology, wastes and environmental pollution and human-environment interactions. Dr Suphavit expressed concern that in the near future there may be an oversupply of environmental scientists who are trained as generalists. He suggested that there should be more effort given to incorporating environmental education and training into the existing curricula for those graduates who are destined to work in development related sectors (see Annex XV).

## **GENERAL DISCUSSION**

30. To support the discussion on environmental training at tertiary level in Asia-Pacific, participants in the Meeting had previously been provided with copies of the abridged reports of the three Resources Development Workshops recently conducted by NETTLAP (see Annexes XVI to XVIII).

31. The Meeting deliberated on a number of major points before discussing the draft recommendation paper. Among the points discussed were the following:

- The need for improved coordination among UN organizations for environmental training and the development of environmental management strategies.

- NETTLAP's current focus on three specific environmental themes is somewhat inconsistent with the need for training based on integrated approaches to environmental science, policy and management and also means that its activities are not consistent with the priorities of some countries;

- The strength of NETTLAP lies in the strength of analogous activities being undertaken at the national level;

- NETTLAP should broaden its perspective beyond the three themes which include environmental economics, coastal zone management and toxic chemicals and hazardous wastes. This may be achieved by addressing inter-disciplinary and multi-sectoral themes at the regional level, while maintaining the flexibility to respond to specific needs of member states;

- Some examples of the content that might be included in the broader range of activities of NETTLAP are:

- > information management, including environmental information accessibility and exchange
- > international treaties and Agenda 21 and other UNCED materials, packaged for use by tertiary level trainers
- > environmental law
- > methods, tools and techniques in environmental education and training
- > curriculum development and preparation of a wide range of instructional materials
- > environmental communication and conflict resolution
- > organizational and institutional arrangements for environmental education
- > environmental education theory and practice

- NETTLAP should also develop mechanisms for identifying the specific additional training needs of individual countries.

- NETTLAP should not expand its activities in a manner which will threaten the benefits which are and will follow from the initiatives it has undertaken in the first year of its existence.

- NETTLAP should enhance capacity building at the national level where existing networks may be in place and which may serve as focal points for implementation of regional initiatives.

- NETTLAP should help promote closer collaboration among UN and other international organizations in the enhancement of environmental training at the tertiary level,

by drawing upon the experiences and resources of these groups in the implementation of the Network's activities; and by seeking other mechanisms of cooperation in such areas as information and material dissemination, and human resource development.

- The continued existence of NETTLAP on a long-term basis may be ensured only by a consensus among member states to commit financial and human resources to the common goal of enhancing tertiary level environmental training in the region.

- An endowment fund, to which international organizations, member countries and private sector contribute, may be a mechanism for ensuring the long term financial security of the project.

## RECOMMENDATIONS

32. To assist Meeting participants in formulating their recommendations they had previously been provided with the recommendations developed by the participants in the three Resources Development Workshops recently conducted by NETTLAP (see Annex XIX).

33. For the attention and action of international and regional organizations:

a. In keeping with the recommendations in Agenda 21 that there should be increased *support of university and other tertiary activities and networks for environmental and development education* and that *the United Nations system, as appropriate, should extend its training programmes, particularly in environmental training* -

It is recommended that UN and other international and regional organizations implementing environment, development and related programmes and activities in the Asia-Pacific region, cooperate in activities which will strengthen and support tertiary institutions in their efforts to increase the extent, quality and relevance of their training in environmental and related topics, taking full advantage of existing coordinating mechanisms such as the Interagency Committee on Environment and Development in Asia and the Pacific and other existing networks.

This cooperation should focus on such activities as:

- assisting tertiary institutions to demonstrate that their infrastructure, programmes and activities are environmentally sound and sustainable;
- improving coordination and cooperation between government, the private sector, communities and tertiary institutions;
- assisting staff in tertiary institutions to enhance their environmental knowledge and skills, recognizing the strong linkages between research, education and training;
- incorporating environmental training into existing courses and curricula;

- developing interdisciplinary environmental training courses which explicitly recognize the need for integrated approaches;
  - repackaging and disseminating existing materials to support environmental and related training activities, with attention being given to enhancing both relevance and accessibility, and to preparing new materials, where necessary;
  - enhancing technologies and developing more effective training methods to enhance access to, and increase the quality of, environmental training programmes;
  - making greater and more effective use of tertiary institutions for training and retraining of people with responsibilities which relate to the environment;
  - establishing staff exchange schemes, institutional counterpart schemes and similar activities which are supportive of tertiary institutions active in environmental training; and
  - promoting and strengthening scholarship funds to increase the opportunities for staff and students in tertiary institutions in developing countries to participate in environmental training and retraining courses.
- b. Recognizing that NETTLAP is an effective means for transferring information and other outputs generated by the projects and programmes operating under the auspices of international and regional intergovernmental organizations such as ESCAP, UNESCO, ILO, UNIDO, WHO and FAO, and others, it is recommended that these organizations collaborate with UNEP to have NETTLAP serve as a vehicle for enhancing access to their information and other outputs, initially for tertiary institutions, but ultimately through these into government, the community and the private sector.
- c. UNEP and other international and regional organizations are encouraged to ensure that NETTLAP is able to respond promptly and effectively to formal requests from Governments for technical assistance related to promoting regional, sub-regional and national environmental training activities, using the expertise and other resources of regional and national tertiary institutions.

34. For the attention and action of UNEP and the Interagency Committee on Environment and Development in Asia and the Pacific and of UNEP:

- d. UNEP is advised to make a presentation to the Interagency Committee on Environment and Development in Asia and the Pacific and to take other appropriate action to ensure that the Committee is aware of and acts upon the opportunities to utilize *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)* as a mechanism for strengthening education and training activities in environment and development in Asia and the Pacific. The Committee is also urged to explore and develop additional ways to enhance cooperation between regional and

international governmental and non-governmental organizations concerned with environmental education and training in the broadest sense, including developing mechanisms for contributing to and participating in the planning and implementation of activities of NETTLAP.

35. For the attention and action of UNEP and UNESCO:

- e. That, as a follow-up to such recent meetings as the UNESCO Asia-Pacific Regional Experts' Meeting on Overcoming the Barriers to Environmental Education Through Teacher Education, to the Regional Seminar on Environmental Education and Teacher Education in Asia and the Pacific and to the Regional Workshop on Environmental Education for Secondary Teacher Education, UNEP and UNESCO should convene a series of sub-regional consultative meetings to identify the tertiary-level (e.g. universities, teacher training colleges, technical institutes) environmental training needs and opportunities of participating countries, to identify the current capacities to address these needs and to work with governments to strengthen organization- and institution-based cooperative regional programmes related to environmental training.
- f. UNEP and UNESCO are urged to decentralize to the regional level, as appropriate, the activities and resources of the UNESCO/UNEP joint International Environmental Education Programme, leading to enhanced cooperation between the two organizations and to increased capacity to implement joint initiatives involving environmental and related education and training activities at the regional level.

36. For the attention and action of UNEP:

- g. UNEP is urged to strengthen its programmes in environmental training at tertiary level in Asia and the Pacific, recognizing the limited ability of member countries in the region to provide the financial resources to support these activities, despite their important contribution to capacity building and to achieving sustainable development.
- h. UNEP is urged to convey to all governments the importance of ensuring that, in their reward system for academic staff, tertiary institutions give equal importance to interdisciplinary work, such as that related to the environment, as they do to discipline-based work. Without such a clear message little progress can be expected in environmental education, training and research at tertiary institutions.
- i. Recognizing the value of networking between institutions and individuals active in environmental training at tertiary level, UNEP is urged to take immediate steps to identify and implement mechanisms which foster cooperation between governments, organizations and private sector donors that will ensure the project is placed on a secure and sustainable footing, and is better able to provide adequate and timely responses to formal requests from member governments.
- j. UNEP is requested to ensure that NETTLAP undertakes an active and effective monitoring and evaluation programme to ensure that the outputs and outcomes of

NETTLAP are consistent with the identified needs of Governments and of tertiary-level educators and institutions in the region.

37. For the attention and action of UNEP and of its NETTLAP project:

- k. Recognizing that awareness raising enhances the success of environmental training initiatives, UNEP is encouraged to promote awareness of the contributions NETTLAP is making and can provide in support of environmental training in the Asia-Pacific region; NETTLAP should build its capacity to keep member governments and others informed of its efforts to enhance the quality, accessibility and relevance of environmental training and education at the tertiary level in the region.

38. For the attention and action of NETTLAP:

- l. In keeping with the need to take an integrated, multi-sectoral approach to environmental training and management and to ensure relevance to all countries in the Asia-Pacific region, NETTLAP should adopt a strategy to broaden its coverage while retaining, at least in the interim, the existing three thematic foci. The expanded coverage should include such important areas as:
- > information management, including environmental information accessibility and exchange
  - > international treaties and Agenda 21 and other UNCED materials, packaged for use by tertiary level trainers
  - > environmental law
  - > methods, tools and techniques in environmental education and training
  - > curriculum development and preparation of a wide range of instructional materials
  - > environmental communication and conflict resolution
  - > organizational and institutional arrangements for environmental education
  - > environmental education theory and practice
- m. NETTLAP is urged to give greater emphasis to the dissemination, and where necessary and appropriate, the development of instructional materials and other outputs which will support institution-based, informal short courses targeting decision makers and opinion leaders from government, the community and the private sector, including developers and investors; the current activities directed towards improving the quality and relevance of formal education and training courses within tertiary institutions in the region should be at least maintained at the levels anticipated for 1994-95.
- n. NETTLAP is requested to promote awareness of, and facilitate access to, current information bases, including those containing:
- regionally relevant case studies to support environmental education and training in tertiary institutions in the Asia-Pacific region;

- an expanded directory of institutions and individuals active in environmental education and training at tertiary level in the Asia-Pacific region; and
  - an information base containing news releases, meeting reports, international and regional environmental agreements and other items relevant to the needs of individuals active in environmental education and training at tertiary level in the Asia-Pacific region.
- o. NETTLAP is urged to explore and implement mechanisms for assisting tertiary institutions in the region to develop more effective linkages with government agencies, community groups, commerce and industry in order to ensure that both the instructors and participants in training courses recognize the issues and challenges facing practitioners and can present realistic and effective responses.
- p. NETTLAP is urged to facilitate the greater involvement of least developed countries and those with transitional, disadvantaged economies, including the Central Asian Republics and the small island states of the Pacific, in environmental training activities, and to encourage developed countries to increase the contributions they make to the project activities.

#### **ADOPTION OF MEETING REPORT**

39. Dr Awang moved and Professor Soerjani seconded the motion to adopt the meeting report. The motion was approved unanimously.

#### **CLOSE OF MEETING**

39. The Chair closed the meeting, but before doing so she expressed the appreciation of the Meeting to Dr. Amini and the NETTLAP staff and secretariat. They had helped ensure the success of the meeting. Ms Supetran also expressed the hope that all participants, and the countries and organizations they represented, would be committed to implementing the recommendations of the Meeting.

40. Dr Hay expressed the thanks of UNEP and the Meeting to the Chair, the Vice Chair, and to the Rapporteur.



# UNITED NATIONS ENVIRONMENT PROGRAMME

## REGIONAL OFFICE FOR ASIA AND THE PACIFIC

December 13 to 14, 1993  
Bangkok, Thailand

### **Regional Consultative Meeting on Environmental Training at Tertiary Level in Asia and the Pacific**

#### **Agenda**

Item 1. *Opening of the Meeting*

#### ORGANIZATIONAL MATTERS

Item 2(a). *Election of Officers*

Item 2(b). *Adoption of the Agenda*

#### SUBSTANTIVE MATTERS

Item 3. *Current Regional Initiatives and Capacities for Environmental Training of Staff from Tertiary Institutions*

Item 4. *Additional Requirements for Regional Activities in Environmental Training of Staff from Tertiary Institutions*

Item 4 (a) *National Perspectives*

Item 4 (b) *Perspectives of International Organizations*

Item 5. *Regional and Sub-Regional Environmental Training Strategies*

Item 6. *Enhancement of NETTLAP to Support Environmental Training at Tertiary Level*

Item 7. *Other Regional Activities to Support Environmental Training at Tertiary Level*

Item 8. *Other Matters*

Item 9. *Adoption of the Report*

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REGIONAL OFFICE FOR ASIA AND THE PACIFIC

December 13 to 14, 1993  
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**Regional Consultative Meeting on  
Environmental Training at Tertiary Level in Asia and the Pacific**

**Annotated Agenda**

Item 1. *Opening of the Meeting*

The Meeting will be opened at 0900 on Monday, December 13, 1993 at the U.N. Building, Bangkok. Dr. R. Amini (UNEP) will open the meeting with a welcome address.

ORGANIZATIONAL MATTERS

Item 2(a). *Election of Officers*

The Meeting will elect a Chairperson, a Vice-Chairperson and a Rapporteur.

Item 2(b). *Adoption of the Agenda*

The provisional agenda will be considered and adopted, with amendments if necessary.

SUBSTANTIVE MATTERS

Item 3. *Current Regional Initiatives and Capacities for Environmental Training of Staff from Tertiary Institutions*

International and regional organizations will be asked to report on their current and planned activities directed at strengthening tertiary (i.e. post secondary) institutions and enhancing the environmental knowledge and skills of staff in tertiary institutions in the region.

Item 4. *Additional Requirements for Regional Activities in Environmental Training of Staff from Tertiary Institutions*

The meeting will be asked to identify and elaborate the need for additional regional or sub-regional environmental training activities directed at staff from tertiary institutions in order to help address national requirements. Participants will also be invited to consider the actions needed to enhance the transfer of environmental information, methodologies and tools from

regional and international organizations into tertiary institutions and through them to key actors in government and industry.

Item 4 (a) *National Perspectives*

Participants familiar with the tertiary institutions in their country and with environmental management and related issues at the national level will be asked to assist the meeting to identify and define further regional or sub-regional training activities. In particular, these should be activities which will lead to a strengthening of tertiary institutions and the enhancement of the knowledge and skills of staff from these institutions in order to better address national concerns related to environment and development.

Item 4 (b) *Perspectives of International Organizations*

Participants from international organizations will be asked to identify the institutional strengthening and the training activities they wish undertaken on a regional or sub-regional basis in order to facilitate incorporation of relevant organizational outputs (e.g. information, methodologies, tools) in tertiary-level environmental education and training programmes.

Item 5. *Regional and Sub-Regional Environmental Training Strategies*

The meeting will review and assess current training activities which focus on enhancing the knowledge and skills of staff from tertiary institutions and will be asked to propose innovative approaches to address currently unsatisfied needs.

Item 6. *Enhancement of NETTLAP to Support Environmental Training at Tertiary Level*

Under this agenda item, the Meeting will be invited to consider ways in which the existing structure provided by the Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP) may be adapted and strengthened to meet the requirements for institutional strengthening and human resources development, as previously identified under Agenda Item 4. These should specifically relate to increasing the effectiveness of the contributions staff in tertiary institutions in the region are able to make towards resolving environment and development issues. With respect to the strengthening of NETTLAP, topics to be addressed might include additional thematic foci, format and frequency of training activities, interagency collaboration, organizational structure and funding.

Item 7. *Other Regional Activities to Support Environmental Training at Tertiary Level*

Participants might wish to identify and develop additional collaborative strategies for institutional strengthening and human resources development with respect to environmental education and training in tertiary institutions.

Item 8. *Other Matters*

The Meeting may consider other matters raised by participants.

Item 9. *Adoption of the Report*

The Meeting will consider and adopt its report.

*Regional Consultative Meeting on  
Environmental Training at Tertiary Level in Asia-Pacific  
December 13-14, 1993*

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**UNITED NATIONS ENVIRONMENT PROGRAMME**  
**REGIONAL OFFICE FOR ASIA AND THE PACIFIC**  
**ENVIRONMENTAL TRAINING**  
**AT TERTIARY LEVEL IN ASIA AND THE PACIFIC**

### **Background**

UNEP has provided catalytic support for the *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*. The Network, and the project with which it is associated, is a realization of the recommendations of a regional meeting of experts held in Bangkok in 1985. The experts developed a programme of action for environmental education and training in Asia and the Pacific.

NETTLAP has subsequently been strengthened and expanded in response to the recommendation in Agenda 21 that there be increased *support (of) university and other tertiary activities and networks for environmental and development education* and the observation in Agenda 21 that *there is a need to strengthen, within five years, information exchange by enhancing technologies and capacities necessary to promote environment and development education and public awareness*.

NETTLAP focuses on human resources development and institutional strengthening. These are recognized, in Agenda 21, and elsewhere as two of the key strategies in the capacity building required to equip developing countries with the ability to pursue their goals of social and economic development while at the same time protecting the environment and conserving natural resources.

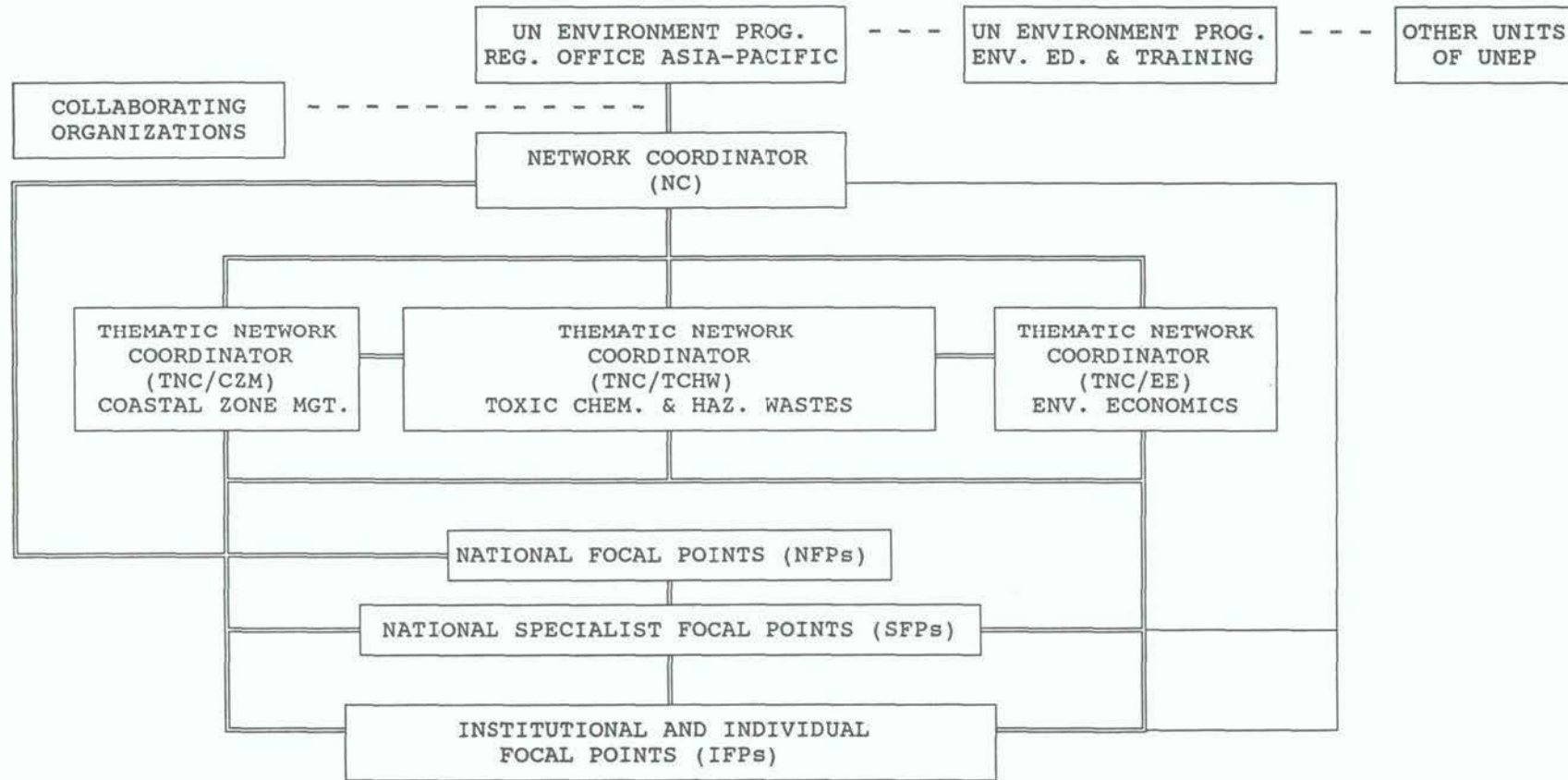
### **The First Year of the Network**

In the past 12 months NETTLAP's operational network has grown rapidly. It was launched with the identification of National Focal Points (NFPs). These have responsibility for policy, major procedural decisions and financial resourcing at the national level. The strengths of the network are its institutional and individual members. These are supported at the regional level by Thematic Network Coordinators and at the national level by Specialist Focal Points, both related to the three themes of NETTLAP:

- coastal zone management;
- environmental economics; and
- toxic chemicals and hazardous wastes.

The Network structure is described in Fig. 1 and the current numbers of participants are given in the following table.

**OPERATIONAL DIAGRAM FOR THE  
ASIA-PACIFIC NETWORK FOR TERTIARY LEVEL ENVIRONMENTAL TRAINING**



Key:   
 ===== Main Interaction Path  
 \_\_\_\_\_ Alternative Interaction Path  
 - - - - - Ancillary Interaction Path

Fig. 1 The current organizational structure for NETTLAP

<b>Current Level of Participation in NETTLAP</b>	
Number of participating countries	33
Number of National Focal Points	32
Number of Thematic Networks	3
Number of Specialist Focal Points	24
Number of Institutional Members	124
Number of Individual Members	1073

The rapid growth of NETTLAP over the past 12 months is a consequence of the substantial need for strengthening of tertiary institutions, for human resources development and for more effective flow of information from an intergovernmental organization into universities and other institutions of higher education and advanced training. In this time, and despite its limited funding, NETTLAP has organized and supported three Resources Development Workshops, preparation of a directory of institutions and individuals active in tertiary level environmental training, and development of curriculum guidelines and instructional resources and aids relevant to the three Network themes.

One of the key activities in NETTLAP is the Resources Development Workshop (RDW). Experienced educators and trainers join with experts from UN and other agencies where they develop a variety of resources including:

- development of the knowledge and skills of the workshop participants;
- development of curriculum guidelines for education and training activities;
- development of instructional resource materials to support the education and training activities in tertiary institutions;
- development of instructional aids (e.g. computer assisted learning software) to support the education and training activities in tertiary institutions;
- development of a self-sustaining network for the promotion and dissemination of the above products.

The following materials have been published by NETTLAP, with the support of UNEP/EETU and UNEP/ROAP, or are in the final stages of preparation:

Environmental and Related Issues in the Asia-Pacific Region: Implications for Tertiary Level Environmental Training - NETTLAP Publication No. 1.

Directory of Institutions and Individuals Active in Environmental Training at Tertiary Level in Asia and the Pacific - NETTLAP Publication No. 2.

Status of Tertiary Level Environmental Training and Education in the Asia-Pacific Region - NETTLAP Publication No. 3.

Priorities for Environmental Training at Tertiary Level in the Asia-Pacific Region - NETTLAP Publication No. 4.

Contributions to Training in the Management of Toxic Chemicals and Hazardous Wastes in the Asia-Pacific Region - NETTLAP Publication No. 5.

Contributions to Training in Environmental Economics in the Asia-Pacific Region - NETTLAP Publication No. 6.

Contributions to Training in Coastal Zone Management in the Asia-Pacific Region - NETTLAP Publication No. 7.

In addition, two issues of *NETTLAP News* have been published.

## UNITED NATIONS ENVIRONMENT PROGRAMME

## REGIONAL OFFICE FOR ASIA AND THE PACIFIC

MULTI-AGENCY AND MULTILATERAL PARTICIPATION  
TO ENHANCE AN EXISTING ENVIRONMENTAL TRAINING NETWORK

The initial structure for NETTLAP has been outgrown and, in some respects, found wanting. The reorganization and further development must build on the strengths of NETTLAP while resolving its current weaknesses. This can be achieved by:

- i) *decentralizing* operation of the thematic networks by establishing three sub-regional Thematic Network Nodes (TNNs) for each theme, two in developing countries (one in South/Central Asia and one in East Asia or the Pacific) and one in a developed country;
- ii) *centralizing* operation of the thematic networks by giving greater autonomy and responsibility to the Thematic Network Coordinators and by ensuring the host institutions are not on the periphery of the region where logistic constraints hamper effective networking;
- iii) *incorporating* the tertiary training activities of regional and international organizations with environment or environment-related programmes;
- iv) *integrating* further the thematic networks so that solutions to cross-theme issues can be identified, explored and implemented;
- v) *broadening* the Network by astute selection of additional themes on which network activities would focus; and
- vi) *funding* the Network at a realistic and sustainable level by substantially augmenting the catalytic support currently being provided by UNEP.

Restructuring and strengthening NETTLAP in this way will help achieve the following:

- provide regional and international organizations with ready access to tertiary institutions and educators in the region without investing in the development of additional networks or other systems of liaison;
- avoid wasteful duplication and counterproductive competition;
- increased cost effectiveness of training activities;
- increased coverage of priority environmental themes for the region;

- improved integration of programmes and hence a more efficient and more holistic approach to issues concerned with environment and development; and
- enhanced institutional backing, political support, academic legitimacy and national and international support of environmental training activities.

### **A Strategy for Expanding and Strengthening NETTLAP**

The essential elements of the strategy might be as follows:

#### **Core Work Programme:**

- use the existing Network of National Focal Points, Specialist Focal Points and individual and institutional network members to identify regional and sub-regional needs for strengthening tertiary institutions and their human resources with regard to environmental education and training;
- identify the requirements and capacities of cooperating organizations with respect to environmental training at the tertiary level and facilitate the availability of information and other inputs to the Resources Development Workshops and other activities of NETTLAP;
- establish procedures to ensure that all NETTLAP activities are consistent with the priority to ensure rapid and effective dissemination of environment and development related information, methodologies and tools produced by UN and other agencies into tertiary institutions and through them into the government and private sectors;
- conduct, at regional and sub-regional levels, further Resources Development Workshops on priority environmental themes in order to develop curriculum guidelines and the instructional materials and learning modules and systems to support curriculum implementation in tertiary institutions in the region;
- evaluate, reproduce and disseminate curriculum guidelines, instructional materials and learning modules and systems to appropriate tertiary institutions in the region, and provide assistance with their incorporation into formal and non-formal education and training programmes;
- develop and implement programmes to encourage and assist tertiary staff with responsibilities for environmental education and training to offer short courses targeted at decision makers and senior level managers in both government and the private sector;
- in response to official requests and where appropriate, conduct targeted in-country Resources Development Workshops to assist in the development of national level environmental training networks and courses in conjunction with Capacity 21 and other UN initiatives; and

- undertake an active monitoring and evaluation programme to ensure that the outputs and outcomes of NETTLAP are consistent with the identified needs of tertiary-level educators and institutions in the region.

### **Critical Supporting Activities**

- continue to prepare, publish and distribute *NETTLAP News* and reports synthesizing regionally oriented information related to environmental education and training at the tertiary level;
- continue to develop and operate a regional network of tertiary-level educators and trainers as this is the fundamental support system for NETTLAP's activities;
- strengthen the institutions where the Thematic Network nodes are based, in order to enhance their capacity to act as sub-regional training centres and information clearing houses for NETTLAP;
- convene regular meetings of representatives of cooperating organizations and occasional Consultative Meetings of National Focal Points and Regional Experts in order to ensure effective cooperation at the organizational level, identification of new priority environmental themes for the region and guarantee the consistency of NETTLAP activities with national and institutional requirements;
- establish effective liaison with professional and other non-governmental organizations active within the region in order to secure their support for and participation in NETTLAP activities, as appropriate;
- operate a database, accessible through electronic networks, providing information on environmental expertise available in the region and on regular and ad hoc courses and other opportunities for professional training in environment and development related subjects;
- operate an information clearing house, focussing on documents and other items which reflect key outputs from international and regional organizations, but are generally not available in tertiary institutions in the region; and
- establish and operate a fellowship fund for professional training in environment and development related subjects and liaise with Regional Advisory Services activities and other relevant bilateral and multilateral programmes.

### **Implementation**

A Regional Consultative Meeting on Environmental Training at Tertiary Level in Asia and the Pacific will be convened in Bangkok in December, 1993. Participants will review the recommendations of the 1985 regional meeting of experts in light of UNCED, Agenda 21 and development which have evolved from those initiatives.



The Meeting will be asked to review and make recommendations related to the proposed core work programme and critical supporting activities for NETTLAP, including the desirability of, and mechanisms for, increasing the involvement of international and regional organizations in addition to UNEP. Consideration will also be given to broadening the activities of NETTLAP beyond the current three themes, to possibly include:

- regional and international legal environmental agreements;
- regional and global environmental change;
- environmental information management; and
- environmental education and training.

UNEP, other relevant regional and international organizations and donor countries and agencies will subsequently be requested to provide financial and other resources to assist with implementing the recommendations of the Regional Consultative Meeting.

## COOPERATION AND NETWORKING FOR ENVIRONMENTAL EDUCATION AND TRAINING IN ASIA AND THE PACIFIC: AN OVERVIEW

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### INTRODUCTION

Environmental Education is a recent education intervention to cope with the problems of environmental deterioration. In Asia and the Pacific, the environmental education programme is at various levels of development. UNESCO, UNEP and other international and regional agencies, institutions and NGO's based in the region work together to implement a programme of action on education and training.

### HISTORICAL BACKGROUND

The 1977 Tbilisi Inter-governmental Conference on Environmental Education organized by UNESCO with the collaboration of UNEP, marked the initial phase of the worldwide environmental education programme. Though no plan of action was produced, forty one (41) recommendations were formulated in the form of broad guidelines. The Tbilisi Declaration and recommendations constitute the framework, principles and guidelines for environmental education at local, national and global levels - for all age groups, both inside and outside of the formal school system. The implementation of the recommendations had been left to member countries or organizations to carry out. The UNESCO-UNEP-International Environmental Education Programme (IEEP) implemented some of the recommendations. Specific action areas were on: (1) exchange of information among institutions; (2) collection and dissemination of information and documentation; (3) publication of various environmental education materials for use in curriculum development and teacher training; (4) organization of study-visits and attachment; (5) provision of support for studies, research and pilot studies; (6) provision of advisory services and development of a pool of expertise to provide consultancy services to the member countries.

The programme of action in environmental education for Asia and the Pacific implemented by the UNESCO Principal Regional Office for Asia and the Pacific (PROAP) is for the primary, secondary, tertiary and post-graduate levels. As a result, training manuals for environmental education personnel, multi-media materials and source book for teachers have been produced.

## **UNESCO FOLLOW-UP OF UNCED - AGENDA 21: EDUCATION, PUBLIC AWARENESS AND TRAINING**

The UNESCO-UNEP-IEEP addresses Chapters 36 and 25: Education, Public and Training of Agenda 21. In the context of the policy and activity emphasis, new frontiers for designing and implementing environmental education programmes were recommended for immediate attention. Though the successful follow-up to UNCED depends first and foremost on actions at the local and national levels, international and regional cooperation is essential to support and supplement the activities.

UNESCO actions with regards to Chapters 36 and 25 of Agenda 21 are as follows:

- Enhance both formal and non-formal education programme on environment and sustainable development at all levels and for people of all ages (interdisciplinary and inter-agency co-operation project: "Environment and Population Education and Information for Human Development", including the UNESCO-UNEP-IEEP;
- Promote basic education in general (Education for All (EFA), Jomtien 1990), and Scientific and Technological (Environmental) Literacy for All (Project 2000+);
- Promote reform of national education systems (International Commission on Education for the Twenty-First Century);
- Foster "Centres of Excellence" and inter-university networks (UNESCO chairs and UNITWIN programmes);
- Increase training opportunities at the university level for educators, scientists, and other relevant professionals in developing countries;
- Improve the community of policy-relevant information to decision-makers;
- Raise public awareness of sustainable development issues by launching co-operative activities with media and the private sector.

## **REGIONAL COOPERATION AND NETWORKING**

The Regional Cooperation and Networking are modalities in implementing the programme of action of environmental education which transcends national boundaries. Where problems are similar or common, the member countries co-operate and coordinate their efforts to work-out and implement cost-effective solutions. There are also possibilities of exchange and sharing of information and experiences through publication and newsletters. The following are examples of regional networks giving prominence to environmental education:

1. APEID - Asia and Pacific Programme for Educational Innovation Development. There are 29 participating countries, with 172 Associated Centres. The Secretariat is the Asia Pacific Centre for Educational Innovation for Development (ACEID), UNESCO-PROAP Bangkok. ACEID implements the UNESCO-UNEP-IEEP action areas for the Asia and Pacific.
  
2. SEAMEO - The Southeast Asia Minister of Education Organization (SEAMEO) has nine "Centres of Excellence" hosted by member countries. Five give prominence to environmental education. These are:
  - . RECSAM - Regional Centre for Education in Science and Mathematics (Malaysia)
  - . BIOTROPH - Regional Centre for Tropical Biology (Indonesia)
  - . TROPMED - Regional Centres for Tropical Medicine (Indonesia, Malaysia, Philippines, Thailand)
  - . INNOTECH - Regional Centre for Educational Innovation and Technology (Philippines).
  - . SEARCA - Centre for Research and Cooperation in Agriculture (Philippines).

The SEAMEO Secretariat (SEAMES) is in Bangkok.
  
3. ARNEE - The Asian Region Network on Environmental Education, and NGO coordinated by the Centre for Research in Human Resources and the Environment University of Indonesia.
  
4. SEASANEE - Southeast Asia South Asia Network in Environmental Education, an NGO based in India.

## PUBLICATIONS

Over the years, UNESCO-UNEP-IEEP has published documents, reports, newsletters (e.g. Connect) dealing with relevant environmental education issues.

The UNESCO Bangkok documents are mostly reports and materials for training of primary, secondary education personnel, as well as for the training of teachers (in and out-of-school).

The Centre for Our Common Future, Switzerland, has recently published a plain language version of Agenda 21 and the other Rio agreements.

Many NGO's have come out with their materials related to the environment, e.g. Malaysian Nature Society (Malaysia), Indian Environment Society (India), etc.

## CHINA, PEOPLE'S REPUBLIC OF

*Zou Jing*

The Chinese Government attaches great importance to environmental protection, which is a national policy of China. We often say the cause of environment protection of China was started with dissemination. We have the specific Department of Education and Publicity in our Agency. Besides in the state Education Committee of our country, there are still two special commissions about environmental protection; one is for environmental engineering. The other is for the environmental sciences. Altogether there are more than 100 universities and colleges which have concern about the environmental sciences. NEPA and the State Education Commission often jointly hold short term training courses for teachers from middle schools, or even the principals from primary and middle schools.

As for the tertiary level institutions, it is very important not only for the student who majors in environmental sciences but also for the environmental protection system in the whole country. NEPA pays considerable attention to them. For example, NEPA has a technical assistance project with the World Bank. There is a sub-project which provides 1.5 million US dollars to support 4 universities and 3 secondary vocational schools. We chose 4 teachers from those four universities to be trained abroad. When they come back they will be the trainers for short term training courses held domestically.

In China the environmental understanding of decision makers and the ordinary people, especially those in rural areas, should be strengthened. In developing countries, most people live in rural area where they cut trees and kill animals in order to live. It is very serious kind of environmental impact. Although they commit a crime, you cannot punish them all. So, the most important thing to do is to publish some very common printed materials or radio and film programmes and distribute them in the appropriate areas. This will let people know that what they are doing is ultimately very harmful for themselves.

## HONG KONG

## Environmental Training and Education in Hong Kong

*Wallace H.S. Cheung*

A list of environment-related courses, including those at the planing stage, is provided at **Table 1**. These are in total 9 tertiary institutes offering such courses in Hong Kong. Seven of them offer courses at degree levels, whilst technical training is provided by 2 technical colleges.

In addition to academic courses, conferences, seminars, technical meetings and short courses are frequently organized by tertiary institutes, learned or professional societies, and the Environmental Protection Department for professionals and technicians in the environmental field. Such short courses are to meet their more specialized training needs. They range from training for legislation enforcement work, to scientific topics like mathematical modelling and ecotoxicology.

**Table 1 : Environmental-related courses at Tertiary Institutes of Hong Kong**

University of Hong Kong

- Bachelor of Science in Environmental Science
- Bachelor of Engineering in Civil or Mechanical Engineering (with optional stream in Environmental Engineering)
- Master of Science in Urban Planning
- Master of Science in Environmental Management

Chinese University of Hong Kong

- Bachelor of Science in Environmental Science

Hong Kong University of Science and Technology

- Bachelor of Engineering in Civil & Structural Engineering (with optional stream in Environmental Engineering)
- Master of Science in Environmental Science/Engineering (proposed part time and full time programme)

Hong Kong Baptist College

- Bachelor of Science in Combined Sciences

Hong Kong Polytechnic

- Higher Certification Course in Wastes & Water Management
- Post-experience Certificate Course in Civil Engineering incorporating Environmental Engineering (5 modules : air pollution control; noise pollution control; public health engineering; sewerage & waste treatment; water resources, supply & treatment)
- Bachelor of Science in Applied Biology and Biotechnology
- Bachelor of Engineering in Environmental Engineering
- Master of Science in Environmental Engineering (proposed part time programme)

City Polytechnic of Hong Kong

- Bachelor of Science in Applied Biology (with optional stream in Environmental Biology)
- Bachelor of Science in Applied Chemistry (with optional stream in Environmental Chemistry)
- Master of Science in Environmental Biology or Chemistry (Proposed part time programme)

Open Learning Institute of Hong Kong

- Bachelor of Science in Environmental Studies

Sha Tin Technical College

- Diploma in Environmental Studies (Pollution)
- Certificate in Environmental Studies (Pollution)

Hong Kong Technical College (Chai Wan)

- Higher Diploma in Environmental Technology
- Higher Certificate in Environmental Technology

## INDIA

*G.V. Subrahmanyam*

The Government of India accords priority to promote environmental education, training and awareness among all sections of society through diverse activities and mass media. At the college/university levels greater emphasis is placed on holistic approaches to research and teaching in natural, physical and engineering sciences.

Some issues relating to the training in the three thematic networks are listed below:

1. Toxic Chemicals, Hazardous Processes and Wastes:

The areas that require immediate attention in hazardous waste management include:

1. Database development
2. Monitoring and analytical techniques
3. Waste avoidance, reduction in recycle
4. Treatment and disposal technologies
5. Environmental impact and risk assessments
6. Emergency response and disaster management
7. Education and Awareness creation.

The following Institutions provide training and research facilities in this subject but not typically for tertiary level students:

1. Industrial Toxicological Research Centre, Lucknow, U.P. India.
2. Indian Chemical Manufacturer's Association, New Delhi.
3. National Environmental Engineering & Research Institute, Nagpur, Maharashtra, India.
4. Environment Protection Training & Research Institute, Hyderabad, Andhra Pradesh, India.
5. Central Leather Research Institute, Madras, India.
6. National Institute of Health, Ahmedabad, Gujarat, India.
7. Confederation of Indian Industries (CII), New Delhi, India.
8. National Chemical Laboratory, Pune, Maharashtra, India.
9. Central Labour Institute, Bombay, India.



These Institutes do not provide Graduate Certificates in TCHPW areas and their training programmes are in the nature of seminars, workshops and short courses for professionals who deal with or are exposed to Toxic Chemical and Hazardous materials. A few well-known universities provide the following degrees both Graduate and Post-Graduate and P.G. Diploma:

1. Andhra University, Visakhapatnam : Post-Graduate Diploma in Environment  
Andhra Pradesh, India Sciences P.GI Degree in Environmental  
Engineering.
2. Jawahar Lal Nehru University : Post-Graduate in Environmental Sciences.  
New Delhi, India.
3. Roorkee University, U.P. India : Post-Graduate in Environment  
Engineering.
4. Indian Institute of Technology : Ph.D and Post-Graduate Degree in  
Bombay, India. Environmental Sciences.
5. Indian Institute of Technology : Ph.D and Post-Graduate Degree in  
Madras, India. Environmental Sciences.
6. Indian Institute of Technology, : Ph.D and Post-Graduate Degree in  
Kanpur, U.P., India Environmental Sciences.
7. Indian Institute of Technology, : Ph.D and Post-Graduate Degree in  
Delhi, India Environmental Sciences.

The recipient Graduates and Post-Graduates have the required technical expertise to manage TCHPW programmes with a little orientation.

### **1. Current Issues related to Coastal Zone Management (CZM)**

India has a coastline of about 6000 kms. The passing phase of rapid development, urbanisation and ever-increasing marine related activities like fishing, tourism, off-shore drilling and extraction of natural gas and traffic of oil tankers has been attracting a large section of country's population to settle in the coastal areas. As a result, degradation in coastal areas in the form of massive land erosion, beach subsidence, encroachments, unauthorised constructions, uncontrolled waste dumping, damage to ecologically sensitive areas are on the increase. This has put the coastal areas to concomitantly increasing environmental stresses and strains including pollution of marine coastal waters in different segments. Being seized with the growing magnitude of the problem, the Ministry of Environment and Forests has issued a Notification (dated Feb., 1991) declaring coastal stretches as Coastal Regulation Zone (CRZ) for regulating activities in the CRZ under Section 3(1) Section 3(2) (v) of the Environment Protection Act, 1986.

Broadly speaking, the Coastal Zone Regulation, as envisaged in the above Notification, is aimed to regulate development activities in the coastal land stretches from 500 mts. of High Tide Line (HTL) on the land-ward side and does not take into account the coastal waters. Most of the littoral States of the country are now engaged in preparing their own Coastal Zone Management Plans on the basis of the above Notification. However, efforts are underway to get the above Notification modified to redelineate the CZR to include coastal water up to 5 km. off-shore.

### **2. Benefit from increased Tertiary Level Trained Manpower**

The environmental management activities as related to Coastal Zone Management in India today is greatly handicapped by the lack of adequate number of trained personnel in that specialised field. Marine coastal related studies so far has been primarily confined to fisheries and oceanographic research in very few Universities and Institutes like National Institute of Oceanography (NIO), Central Salt and Marine Chemical Research Institute (CSMCRI), Gujarat, Central Marine Fisheries Research Institute (CMFRI), Cochin, Centre of Advanced Study in Marine Biology, Annamalai University, Department of Marine Living Resources, Andhra University, Vishakhapatnam etc. These Institutes too have very limited scope and capacity to provide tertiary level training in Environmental Planning and Management of Coastal Zone. It may be, therefore, doubtlessly said that the country would be immensely benefitted from an increased availability of personnel with appropriate tertiary level training in coastal zone management.

### **3. Training and Assistance to develop the required expertise**

Recognising the importance of oceans in economic development and progress of the Nation, the Government of India set up the Department of Ocean Development (DOD) in 1981 for planning and co-ordinating oceanographic survey, research and development, management of ocean resources, development of manpower and marine technology. One specific objective of the Department is to develop human resources (knowledge, skill and

expertise) to cope with and manage the coastal environment. It is realised now that development of trained manpower is an essential pre-requisite for effective management of the country's Coastal Zone.

#### 4. Identified suggested Institutions

Keeping in view the configuration of the Indian coastline, which is more or less equally divided length-wise, three Institutions each on the East coast and the West coast and the West coast with the names of the individuals are suggested as follows :

1. Prof. M.M. Taquikhan  
Director  
Central Salt & Marine Chemical Research Institute  
Gijubhai Badheka Marg  
Bhavnagar-364 002.
2. Dr. M.D. Zingde  
Scientist Incharge  
Regional Centre  
National Institute of Oceanography  
Seashell, Seven Bungalows  
Versova, Bombay-400 061
3. Dr. V.N. Sankaranarayanan  
Scientist Incharge  
Regional Centre  
National Institute of Oceanography  
Providence Road, Post Box No.1913  
Cochin-682 018.
4. Shri G. Govindarajan  
Scientist  
Central Electro- Chemical Research Institute  
CSIR Complex  
Madras-600 113.
5. Prof. K.V. Ramanamurthy  
Department of Marine Living Resources  
Andhra University  
Visakhapatnam-530 003.
6. Dr. R.N. Bhattacharyya  
Sr. Environmental Engineer & Incharge  
Central Pollution Control Board  
Calcutta-700 033.

## 5. Network Effectiveness and Available Expertise

From the suggested network of six Institutions it may be seen that they are more or less evenly distributed of both the east and west coasts. These Institutions have been working in the field of marine science for varying lengths of period and have the potential to develop capability to impart the required training with special reference to coastal zone planning and management as may be needed. Each of these Institutions has a faculty of highly knowledgeable and expert scientists/educators who may need just an 'Orientation Training' to initiate the manpower development programme.

### Environmental Economics

The subject of environmental economics is a new and upcoming discipline and is inter-disciplinary in nature. Environmental economics is a complex discipline that will involve a host of organisations across the country and the region. To get their cooperation, it is necessary to sensitise them and to convince them about the feasibility and usefulness of such environmental economics through workshops and training programmes.

The subject of environmental economics is yet to be introduced into the syllabi of Indian Universities/Institutions where environment is being taught. At present a few institutions in the country are dealing with environmental economics at research level. These are:

1. Indira Gandhi Institute of Development Studies, Bombay
2. Institute for Social and Economic Change, Bangalore
3. Institute of Economic Growth, New Delhi
4. Indian Institute of Management, Ahmedabad
5. Indian Institute of Science, Bangalore
6. Wildlife Institute of India, Dehradun
7. G.B. Pant Institute of Himalayan Environment and Development, Kosi, Almorah.

The Centres of Excellence set up by this Ministry such as Ecological Research and Training Centre at Indian Institute of Science, Bangalore, Centre for Mining Environment at Dhanbad, Salim Ali Centre for Ornithology and Natural History (SACON) Coimbatore and other autonomous Institutions under this Ministry such as CPCB, Wildlife Institute of India, G.B. Pant Institute of Himalayan Environment and Development, have strong environment and ecological base and have the potential to integrate economics with environment and ecology. The scientists working in these Institutions could be trained in this discipline.

## INDONESIA

**ENVIRONMENTAL EDUCATION AND TRAINING**  
**Efforts and Activities in Indonesia and Potential Mutual**  
**Interaction with Neighbouring Countries\***

*Mohamad Soerjani*

## 1. INTRODUCTION

Three of the most important and pressing concerns today are global *partnerships* among nations, *environmental quality* and *poverty alleviation*. These are the intertwining aspects to ensure the continuance of the life and welfare of man and other living organisms. The problems and quality of the human resource and our living environment are the permanent concern and challenge in terms of achieving long-term sustainable development (Soerjani 1988). Immediately one recognizes that nothing is longer-term in this respect than environmental education (UNESCO 1980; 1983; Anon 1988). Through environmental education and training it is expected that there will be an increasing wisdom that facilitates global partnerships and cooperation among countries and nations, that the quality of our environment will be continuously improved, and that the struggle against poverty can be equally and successfully shared by all countries.

The challenge is extremely great, complex and complicated. It has to be prioritized through the identification of main issues, so that the complexity can be simplified, then shared properly and based on equal opportunity among all concerned, since we all have a very limited resources, in man-power, facilities, time and funds.

This is a little contribution to enhance efforts and activities in environmental education and training in the Asia Pacific region, in which Indonesia is part of it and shared common concerns with the rest. Perhaps, rather than formulating additional requirements and activities, I earnestly hope that we are able to foster and strengthen the already existing efforts and activities, and try to suggest how these could flourish and mutually beneficial in broader scopes and areas.

## 2. ENVIRONMENTAL MANAGEMENT AND ENVIRONMENTAL EDUCATION

As defined under the Act on Basic Provisions for the Management of the Living Environment (Act No 4 of 1992), the living environment is the spatial entity with all objects, potentials, conditions and living organisms, including man and his behaviour, which influence the continuance of the life and welfare of man and other living organisms. The management of the living environment is an integrated effort in the utilization, regulation, conservation, supervision, control, restoration and development of the living environment. This is implemented based upon the sustenance of the capability of the harmonious and balanced environment to support continued development for the improvement of human welfare.

Furtheron it is stated that the objective of the management of the living environment are:

- a) to achieve harmonious relations between man and the living environment as an objective of the development of the Indonesian individual in his/her totality;
- b) to control wisely the utilization of natural resources;
- c) to develop the Indonesian individual as a proponent of the living environment;
- d) to implement development with environmental considerations for the interest of present and future generations;
- e) to protect the nation against the impact of activities outside the state's territory which causes environmental damage and pollution.

The right to a good and healthy living environment of every person is ensured in this Act, however, it is also stated that every person has the right and obligation to maintain the living environment and to prevent and abate environmental damage and pollution.

In support of this effort, the government has the obligation to cultivate and develop the public's awareness of its responsibility in the management of the living environment by means of information, guidance, education and research in the field of the living environment. It is clear therefore, that successful *development* has to be supported by successful effort in *environmental management*, in which *environmental education and training* is a very essential part of the entire system.

## 2.1 Overall Efforts in Environmental Education

### 2.1.1 The curriculum approach

At present there are an increasing effort in the various phases of education system from pre-school through to tertiary level to accommodate environmental education components. One or more alternative strategies can be followed, as appropriate to the level or to the imperatives of existing curricula (see APEID 1992: 17-18). There strategies are:

**Infusion:** including examples drawn from actual environmental issues; this is *descriptive* in nature as a beginning of the creation of environmental awareness;

**Integration:** integrating environmental concerns into all aspects of the curricula; this can be through *greening the curricula*, and may have *prescriptive* objectives, what is the prospects of the human function, role and responsibility in the environment; Figure 1 shows the model how to regreen the curricula.

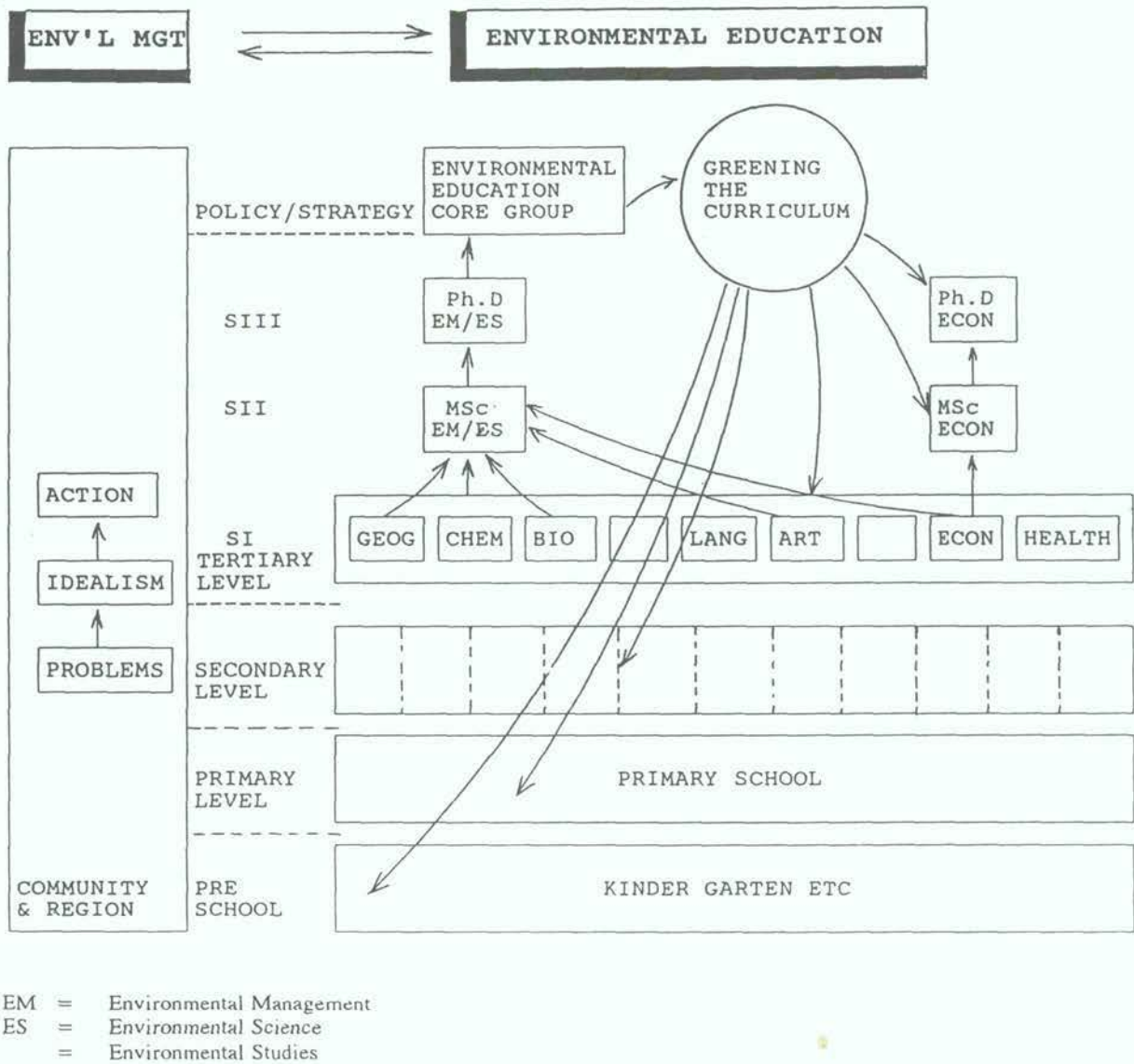


Fig. 1 Model of greening the curricula from pre-school up to tertiary level (Soerjani 1992; 1993).

**Subject:** establishing separate courses on environmental matters; this may follow an additional *monolithic* classes in environmental science or management, including programmes leading toward degrees, undergraduate as well as postgraduate degrees in *environmental science*. This is a *nomothetic* approach, as a contribution to the advancement of science.

### 2.1.2 Textbooks and reading materials

There are efforts to provide textbooks and reading materials in env. matters for the teachers and lecturers, the school children and students as well as for the public at-large.

These are among others (all are written in Indonesian)

- a) *Environmental Law* (two volumes), 1981; 1985. M. Danusaputro, Bina Cipta, Jakarta.
- b) *Environmental Law and Regulation*, 1983. K. Hardjosoemantri, GMU Press, Yogyakarta.
- c) *Ecology, Living environment and Development*, 1983. O. Soemarwoto, Djambatan, Jakarta.
- d) *Ecology of Sulawesi*, 1987. A.J. Whitten, M. Mustafa & G.S.Henderson, GMU Press, Yogyakarta. e) *Environment: Natural Resource and Population in Development*, 1987. M. Soerjani, R. Munir and R. Achmad. UI Press, Jakarta.
- f) *Environmental Impact Analysis*, 1988. O. Soemarwoto, GMU Press, Yogyakarta.
- g) *Impact Analysis Upon the Environment*, 1988. G. Suratmo, GMU. Press, Yogyakarta.
- h) *Forest for Sustainable Development*, 1990. Anon. Ministry of Forestry, Jakarta.
- i) *From the Indonesian Tropical Rain Forest Conservation Areas*, 1990. Anon. Ministry of Forestry, Jakarta.
- j) *Environmental Quality in Indonesia 1990*, 1990. S.T. Djajadiningrat, Office of the Minister of Population and Environment, Jakarta.
- k) *Indonesia in the Forum of Global Environmental Issues*, 1991. O. Soemarwoto, Gramedia Pustaka Utama, Jakarta.
- l) *Clean Ciliwung Campaign*. 1991. M. Soerjani. Ciliwung Campaign Secretariat, Jakarta.
- m) *Introduction to Environmental Science*. Reading Material, 1993. M. Soerjani. CRHRE-UI, Jakarta.
- n) *Biodiversity*. In press. O. Soemarwoto & Idjah Soemarwoto, In press. Total Foundation, Jakarta/Paris.
- o) *The Human Survival and the Environment*. In press. ICI-Indonesia, Jakarta.



These illustrate a variety of interests, concerns and the need to promote environmental education concerning various aspects, and for audience at all levels. There is a trend that reading materials for primary and high school will be prioritized. This is in line with the Rio agreement that basic education is the underpinning for environment and development education (Keating 1993: 57).

### 2.1.3 Community education

The community education has been launched through various activities, designed and implemented by the community. Mostly these are sponsored or supported by WALHI (Forum of the Friend of the Environment), Funds of Friends of the Environment (*Dana Mitra Lingkungan*) the Student Association (e.g. Mapala UI, Lawalata IPB, etc). The Clean Ciliwung River Campaign and the Clean Sea Water Campaign are some examples. Regreening the cities and mangroves is also a campaign implemented by the community and supported by the government.

## 2.2 Education and Training at Tertiary Level

### 2.2.1 Environmental Study Centres

An important activity in support of environmental management throughout Indonesia has been the development of Environmental Study Centres (ESCs). These centres were established to provide technical expertise for research, **training** and extension services in all aspects of environmental matters at the national and regional levels. The centres have been established within the state or public and private university system. They are expected to help in meeting the need for environmental expertise needed throughout the country and at all levels of government, eliminating reliance on a large central bureaucracy (Salim 1988).

Each ESC is a unit of the university system which has academic and technical responsibility in fulfilling the Tridharma or three university functions of research, **education** and **training**, and public service. Within the university structure, however, each ESC has a unique status, internal organization and research focus. Individual ESC performs a wide variety of functions for both the public and private sectors. They conduct basic and applied research and they play a role in the EIA process which is the analysis of environmental impacts of specific projects.

In the field of environmental education and training ESCs provide EIA training for consultants, proponents of projects, government officials and community leaders. They also conduct courses on population and the environment and other issues related to environmental research management e.g. *waste management, integrated river management, area sustainable development, and environmental research methodology*. ESC of the University of Indonesia has been conducting 52 Basic EIA training courses with 2644 participants, 13 Advanced EIA training courses with 451 participants and some EIA Evaluation training courses for various departments. Some ESCs are also directly or indirectly involved in the formal undergraduate and graduate

degree programs related to environmental science and management. ESCs also play a significant role with central government agencies by undertaking special studies and by serving as expert members of EIA central commissions. At the provincial level ESC members are represented in provincial EIA commissions.

The importance of collaboration between the ESCs was recognized in 1985 with the establishment of the BKPSL (*Badan Kerjasama Pusat Studi Lingkungan*) or the Association of ESCs in Indonesia (AESCI). The role of the AESCI is to enhance the functioning of both individual ESCs and the entire network. To achieve this, various standing committees have been established, a journal *Lingkungan dan Pembangunan* (Environment and Development) and a newsletter are published and distributed, and biennial conferences are held (Soerjani 1989).

### 2.2.2 Undergraduate education

There is no undergraduate degree programme in environmental science or environmental management. At the undergraduate level, environmental matters are mostly taught as an integral part of the existing curricula. Faculties or departments that integratedly cover environmental matters in most of the lectures in the curricula are: Faculty of Mathematics and Natural Sciences, Faculty of Law, Faculty of Public Health, Faculty of Engineering, Department of Social Psychology, Department of Community Medicine, Department of Biology, Department of Anthropology, etc. Mostly these are integrated in the following lectures: Ecology, Human Ecology, Environmental Health, Environmental Law, Environmental Psychology, etc.

Some have developed this matter into monolithic lectures, e.g. introduction to environmental science, such as in the Departments of Biology, Chemistry, Physics, Mathematics, Geography and Pharmacy.

### 2.2.3 Graduate level

At the graduate level, degree programme in environmental science has been offered by Gadjah Mada University and the University of Indonesia. Bogor Agricultural University, University of North Sumatra and Hasanuddin University in Ujung Pandang are conducting degree programmes in natural resource and environmental management. Bandung Institute of Technology is offering a Master degree in Development.

## 3. ASEAN COMMUNITY CONCERN

A similar trend can be noticed in the history of the Asean region, in which awareness of the strategic role of environmental education in the long-term achievement of sustainable development is growing (Danusaputro 1980). This has been indicated by the various activities conducted in this region. For example, in August 1980 UNESCO and RIHED organized a Regional Conference on Environmental Education and its Transfer in Asean Universities,

which was conducted by University Pertanian Malaysia (UPM) in Kuala Lumpur. In August 1984 RIHED and Friedrich Naumann Stiftung (FNS) organized a Symposium on Environmental Education in Asean Countries, held in Bogor, conducted by the Centre for Research of Human Resources and the Environment, University of Indonesia (Balasubrammaniam 1985).

There are publications available concerning environmental education in various countries in Asia (Sharma 1984), in Southeast Asia (Chelliah 1985), in Indonesia (Soemarwoto 1981; Soerjani 1987; etc.), in the Philippines (Villavicencio 1985). There are also theses and dissertations written as the result of studies in evaluating Environmental Education in various countries in Southeast Asia, or developing and evaluating curricula or teaching materials in Environmental Education, namely in the Philippines (Rabago 1981; Cortes 1986), in Malaysia (Gan 1987), etc.

Under the UNEP-ASEAN Environment Programme III (ASEP III) 1988-1992, as the third phase of the Regional Collaborative Programme on Environment of the Asean Countries (Anon 1988), the importance of environmental education as a continuing process in support of overall environmental management was clearly recognized. The Asean Expert Group on the Environment (AEGE) has agreed to prepare a Regional Programme for the Training of Trainers on Environmental Education in the Asean Region.

Under the priority area of EET and Information (EETI) of ASEP III there will be efforts to sustain the groups of individuals and institutions that have developed under ASEP I and II, who are well-versed in environmental education and aware of the value of environmental protection matters and management. Efforts will also be made to promote environmental awareness in other sectors, and to enhance information exchange among the member countries of Asean. These are apparent in the following goals and proposed project activities for the period 1988-1992.

- (1) Preparation of regional and national action plans in EET with emphasis on the primary level and on specific priority groups (goal no. 15).

The activities/projects to be conducted to achieve this goal are:

- a) Development of communication media and materials for enhancing environmental awareness in Asean.
- b) Regional programme for the training of trainers on environmental education in the Asean region.
- c) Strengthening of public awareness on the environment at the village level.
- d) Development of techniques to promote environmental awareness among specific target group.
- e) Adaptation of environmental education materials for use in primary schools.

- (2) Implementation of a regional programme leading to the establishment of an information network among the Asean countries and the publication of regular reports on the status of the environment in member countries using a common format for areas of common concern (goal no. 16).

The activities/projects conducted to achieve this goal are:

- a) Computerization of environmental information and data.
  - b) Publication of Asean Environment Newsletter.
- (3) Implementation of a regional programme to promote environmental awareness among the general public (goal no. 17).

The activities/projects will be the following:

- a) World Environmental Day. This is to be implemented by all member countries, who will celebrate it with a view to promoting greater public awareness of the importance of the environment.
- b) Chemical safety campaign. To produce audio-visual aids and other similar materials for a chemical safety campaign.
- c) Asean wildlife society. To be implemented through regular meetings, to promote greater public awareness of wildlife conservation and management.

It is obvious that the goals and projects/activities have to be implemented in a more coordinated way. A better coordination is not only for the sake of cost-efficiency and cost-effectiveness, but also to really achieve the expected results and goals. It is only with better coordination that these programmes in EETI as a continuing process can ultimately facilitate the expected sustainable development in the Asean region.

At the Eighth Meeting of AEGE, held in Manila on April 17-20, 1985, it was noted that there had been *no* progress in the implementation of the Asean Action Plan on EET, and that the Action Plan had *not* been the subject of any experts meetings similar to those held to discuss nature conservation (Anon 1988). Based on this fact, there is an urgent need that any future activities in EET in this region are structured and made functional, with a stronger effort for a better coordination, so that any effort will contribute to the need for continuous and long-term improvement of environmental management.

#### **4. ASEAN REGION NETWORK ON ENVIRONMENTAL EDUCATION**

An Asean Region Conference on Environmental Education (ARCEE) was organized in Jakarta on June 2-5, 1993 as a follow-up of the Global Forum Workshop on Environmental Education held concurrently with the Earth Summit in Rio in 1992. The meeting was attended by 205 participants from 20 countries and representatives of international organization (UNESCO, UNEP, IBRD and the Asean Secretariat).

The conference objectives were as follows : to examine the current trends and problems common to the region and seek solution based on existing experience, and investigate programmes drawing on local and regional expertise. The conference produced conclusions and recommendations on: *out-of-school education, training programmes, greening the curriculum, degree programmes in environmental education and strengthening the present cooperation with action programmes through a network system.*

The conference also concluded that there are a lot of efforts to promote programmes and activities in the field of environmental education in or related to the Southeast Asian Region. The problems with this is that there is lack of proper coordination and interactions among these activities, as well as lack of continuity of the activities. It was felt that there is a need to promote activities that disseminate information related to environmental education, to enhance cooperation among programmes in environmental education in the Asean Region and with the interfacing regions as well as regions elsewhere with shared problems, interests, concerns and (similar) programmes.

Based on the above issues, problems and areas for further considerations, the conference agreed to establish the **Asean Region Network on Environmental Education (ARNEE)** which was officially launched on the *Environmental Day: June 5, 1993* in Jakarta.

ARNEE will have *members* consisting of institutions or organization dealing with environmental education in the six Asean member countries, and will have *associate members* in other countries or regions as well as international agencies, foundations and associations as *supporting members*. The temporary structure of the network are as follows: Until it is permanently structured, the network will have chair-persons consisting of representatives from Indonesia, the Philippines and Thailand. The chairperson from Indonesia representing the Association of Environmental Study Centres in Indonesia. The other members of the chairpersons are representatives of the Environmental Education Network of the Philippines Inc. (EENP Inc.) and Chulalongkorn University in Thailand. In the next phase the chairperson will consist of representatives from Brunei Darussalam, Malaysia and Singapore.

The network has a secretariat at the Centre for Research on Human Resources and the Environment, University of Indonesia, in Jakarta. The urgent identified priority activity of the network secretariat during the initial stage is information exchange, for which the UNESCO - Asia-Pacific Education Innovation Development (APEID) will immediately provide support for an ARNEE Newsletter to speed up information and communication needs of the regional network, e.g. exchange of curriculum and reading materials, etc. Other programmes to be further developed are joint activities in training, workshops, studies and action research, and exchange of students and staff.

As the first action of ARNEE there will be a meeting in Jakarta on January 17-21, 1994. The meeting will have two main objectives:

- (a) To formulate further detail of the planning of programmes of ARNEE to fulfill the mission in promoting environmental education (mainly) in the Asean region.

- (b) To conduct a training workshop for lecturers of local universities in Jakarta consisting of lectures provided by a panel introducing and discussing environmental concept, environmental science, environmental law & regulation, environmental education, environmental economics, environmental health, environmental management and development and environmental research methodology. The participants who are lecturers in biology, chemistry, geography, law, anthropology, medical science, engineering, philosophy, psychology, etc) will have to discuss and report what aspects of the environmental matters that can be infused, inserted and integrated into their lectures. If considered as successful, this will be a model in which similar activities will be conducted under ARNEE auspices.

## 5. REGIONAL AND SUB-REGIONAL ENVIRONMENTAL TRAINING STRATEGIES

Before any additional requirements for regional activities in environmental training of staff from tertiary institutions (as requested) is identified, it may be more appropriate if the general strategy and guidelines to promote cooperation is suggested first.

### 5.1 General Strategy

It has to be frankly noted that there are too much pressure and output expected from environmental education and training to be fruitful in overcoming crucial environmental problems that the regional and the global community are facing. Therefore, efficiency and effectiveness of the various activities are very important, and these have to be properly coordinated, communicated, or at least implemented in a very transparent way. New programmes have to be adjusted with the existing activities, and if possible these new programmes will be mainly designed to strengthen the existing ones.

### 5.2 Evaluation of the Existing Activities

There is an urgent need to evaluate the existing activities in the Asia Pacific region conducted by the respective country and any other inter-country activity. In my opinion this evaluation must be conducted by an inter-agency team (UNESCO, UNEP, UNFPA, IBRD, ADB, etc) supported by agencies that are concerned and committed to the success of environmental education in support of sustainable development in this region.

The strategy of this evaluation must be based on the reality that there are activities in the region at the bottom level that needs to be recognized, promoted and spread in a broader areas and scope, which may facilitate further independent cooperation. this may not need additional budget, but recognition and encouragement. Even if there is a budget to support, what is appropriate is only *seed-money* to support, because with this strategy, bottom-up institutions initiatives and resources will continuously grow appropriately and healthily.

The model of activities in the region to be evaluated is shown in Table 1.

Table 1. *Matrix of activities in environmental education and training in the region, sub-region, and country*

ACTIVITIES	REGION								
	ASIA-PACIFIC					EUROPE	ETC.		
	Southeast Asia					South Asia	Etc.		
	A	B	C	D	E				
Education									
Training									
Research/Studies									
Seminar/Workshop									
Publication & Information									
Community Service									
Etc.									

With such a clear mapping, then priority of additional new activities and/or activities to support the existing one for mutual benefits can be planned and developed.

## 6. ADDITIONAL ACTIVITIES REQUIRED AND ENHANCEMENT OF NETTLAP MISSIONS

Based on the above (chapter 5) strategy, the two aspects of this chapter (6) are combined to discuss *additional activities to enhance NETTLAP missions*.

### 6.1 Environmental Education and Training Evaluation

State-of-the-art of existing activities in the Asian-Pacific Region has to be evaluated by a team with members representing agencies and institutions committed to the substance namely UNESCO, UNEP, UNFPA, IBRD, ADB, Asean Secretariat, SEAMEO and some regional professional associations (probably). In the evaluation perspective, one of the important criteria is to identify problems and needs to be matched with existing activities and supporting resources. Based on the existing condition of the social and political system, a resume of the evaluation may provide an output, which existing activities is feasible to be supported, promoted and what "new" additional activities can be offered.

## 6.2 Facilitate Bottom-up Activities

Most of the bottom-up initiatives and activities have certain weaknesses. In most cases it is always easy to conclude that the most important weakness is funding. This is not always true, on the other hand there are lack of incentives, e.g. recognition, encouragement and credibility, which are not necessarily in terms of materials or funds. Therefore, at least as a beginning, through an evaluation effort, these local (mostly NGO-self reliance organization) activities must be recognized and encouraged.

## 6.3 Seed Support

To facilitate local (bottom-up) initiatives to develop programmes in a sustainable way, only *seed support* is recommended. This means that a limited fund acquired by NETTLAP can be spread to support more activities, rather conducting just *one* activities that may require a lot of funding, which can be used as seed money for *ten* or more activities in line with the objective of NETTLAP. In Indonesia we support Environmental Study Centres in the region to conduct several (5-10) regional activities, each with only a seed funding of US \$ 1,500 - 2,000. With this support, some of them are able to mobilize local resources to support regional activity with a budget of US \$ 20,000.

## 6.4 Other Activities

There is a need for support of other activities, namely: training of the trainers (in EIA, research methodology, clean river campaign, domestic waste management, etc), textbook writing or writing reading materials, etc. for the community, school children, and high school students.

## 6.5 Offered Activities

Local and regional activities that have been conducted in Indonesia under the auspices of the Association of ESC in Indonesia (AESCI) and the Asean Region Network on Environmental Education (ARNEE) are offered for the benefit of the other countries in the region. These offers includes the distribution of our journal *Environment and Development* (mostly written in Indonesian with an English Summary), the newsletters (AESCI, UCE and ARNEE), the training workshop on environmental education at undergraduate level (see Appendix 1), training of the trainers in EIA, etc.

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*PROPOSAL***ARNEE MEETING AND ACTIVITIES**

JAKARTA, INDONESIA: 17 - 21 JANUARY 1994

- A. DATE :** January 17 and 21, 1994
- B. VENUE :** CRHRE, University of Indonesia
- C. ORGANIZER :** ARNEE SECRETARIAT, c/o CRHRE UI, Jalan Salemba 4, Jakarta
- D. SPONSORED BY:** UNESCO, ASEAN SECRETARIAT, ASAIHL, the British Council, GOETHE INSTITUTE, and JICA
- E. SUPPORTED BY:**
- The Ministry of Education and Culture
  - The Ministry of State for Environment
  - The Governor of Jakarta

**F. OBJECTIVES:**

- 1) Analysis of environmental education in undergraduate curriculum at universities in Jakarta.
- 2) Model of the insertion and integration of environmental problems, knowledge, awareness, and commitments into the curricula of various disciplines at undergraduate level through a training program for the lecturers; if successful it will be implemented elsewhere in the Asean region by ARNEE.
- 3) Planning of action programs of ARNEE in promoting environmental education and training in the ASEAN region.

**G. TRAINING WORKSHOP ON ENVIRONMENTAL EDUCATION AT UNDER GRADUATE LEVEL: Infusion and Integration of Problems, Knowledge, Awareness and Commitments into the Curriculum.****Date :** January 18 - 20, 1994**Venue :** CRHRE, University of Indonesia, Jl. Salemba 4, Jakarta  
phone: 62 21 330318; 335929; Fax: 330266**Participants:** Lecturers from the University of Indonesia and some other local universities in Jakarta, a total of 20-30 participants. Prioritized fields:

- |                              |                                      |
|------------------------------|--------------------------------------|
| 1) Biology                   | 7) Engineering,                      |
| 2) Chemistry & Physics,      | 8) Economics,                        |
| 3) Mathematics & Statistics, | 9) Psychology,                       |
| 4) Geography,                | 10) Philosophy,                      |
| 5) Sociology,                | 11) Law,                             |
| 6) Anthropology,             | 12) Medical Science & Public Health. |

**H. WORKSHOP PROGRAM**

Sunday Jan 16, 1994	Monday Jan 17, 1994	Tuesday-Thursday Jan 18, 20, 1994	Friday Jan 21, 1994
Arrival of members of ARNEE	ARNEE * Executive members to meet; * Preparation of the training	Training Program	ARNEE * Workshop: Presentation of the training results from participants * Evaluation and follow-up

**I. TRAINING PROGRAM**

Tuesday Jan 18, 1994	Wednesday Jan 19, 1994	Thursday Jan 20, 1994
Morning: Panel Discussion  1 Environmental concept 2 Ecology as a basis of environmental science 3 Environmental science	Morning: Panel Discussion  4 Env. law regulation policy, institution, tradition 5 Env. health 6 Env. education 7 Env. economics	Morning: Panel Discussion  8 Env. management 9 Env. system analysis 10 Env. research methodology
Lunch	Lunch	Lunch
Afternoon: Working groups  Group discussions Brief reports	Afternoon: Working groups  Group discussions Brief reports	Afternoon: Working groups  Group discussions Brief reports
Evening: Open Group Discussion	Evening: Open Group Discussion	Evening: Open Report Preparation

Groups

- A. Natural Sciences,
- B. Social Sciences,

- C. Technology, and
- D. Health.

**Lecture topics:**

1. Environmental concept: the living environment:	MS; KA
2. Ecology as a basis of environmental science:	MH; RH
3. Environmental science:	ES; VM
4. Environmental law, regulation, and institution:	KH; RS
5. Environmental health:	HR; HK
6. Environmental education:	LG; TC
7. Environmental economics:	ES; SU
8. Environmental management and development:	SS; MA
9. Environmental system analysis:	TS; MH
10. Environmental research methodology:	PS; AK

**Invited Lecturers:**

AK	=	Amanda Katili	(Indonesia)
ES	=	Emil Salim	(Indonesia)
HK	=	Haryoto Kusnoputranto	(Indonesia)
HR	=	H. Rustamadji	(Indonesia)
KA	=	Kamariah Abdul Salim	(Brunei Darussalam)
LG	=	Lucille Gregorio	(Unesco)
MA	=	M.A. Aziz	(Singapore)
MH	=	Monica Hale	(England, London Guildhall Univ.)
MS	=	Mohamad Soerjani	(Indonesia)
PS	=	Percy Sajise	(Philippines)
RH	=	R. Harger	(Unesco)
RS	=	Retno Soetaryono	(Indonesia)
SS	=	Surin Setamanit	(Thailand)
SU	=	Suparmoko	(Indonesia)
TC	=	Thilla Chelliah	(Malaysia)
TR	=	Tresna Sumardi	(Indonesia)
VM	=	Virginia Maclaren	(UCE-Univ. of Toronto)

**J. ORGANIZING COMMITTEE**

Officer in-charge:	M. Soerjani
Chairman:	H. Rustamadji
Vice Chairman:	Haryoto Kusnoputranto
Secretary :	Supriadi
Vice secretary:	Sian Rahimah Abdullah
Treasurer:	Sudarmasti Gondokusumo
Members :	H. Soewojo
	Handari W. Wardhana

## JAPAN

## Environmental Education and Training in Japan

*Dr. Mitsuru Yamamura*

1. Environmental education in universities mainly has been done in physical science departments such as engineering, agriculture, physical science, so far. That is because understanding of natural processes and mechanisms underlying the pollution phenomena is the first step to solve the environmental problems. So, there have been many departments and/or faculties which are specialized in environmental issues.
2. Nowadays, global environment problems such as global warming issue have been coming up. The issues are not only natural phenomena, but also closely related with consumer's lives and the social and economic structures. Therefore, to solve the issues, researches from a standpoint of social science such as "Will there be some policy measures that are able to limit or stabilize carbon dioxide emission without imposing too much burden on the economy?" are needed. So, some trials have just began in the field of social science. For example, Kyoto University and Hitotsubashi University established a course of environmental economics in their department of economics. And also Yokohama University established a course of environmental laws in the department of economics.
3. However, environmental education in these universities seems to be rather specialized in each field of their own. I think that comprehensive and interdisciplinary education on the environment should be achieved in those universities. To promote the comprehensive and interdisciplinary education, cooperative studies with researchers who are different in the specialties are essential.
4. The Ministry of Education has prepared the curriculum guideline and the guideline manual for environmental education, for teachers of primary and secondary schools. The Environment Agency supported the Ministry of Education in preparing the guideline manual.
5. The Environment Agency is making efforts to promote environmental education and preservation activities by providing basic information and opportunities of study for general public.
  - (1) Provision of text, serial pamphlets and videos for environmental education through the Japan Environment Association

- (2) Eco-mark program which recommends putting on a certain mark on products that help to protect the environment (55 items, 2,450 products as of February 1993)

6. The Environment Agency also supports and backs up local governments and public entities.

- (1) The National Environmental Training Institute is a government organization to promote the ability of and to enhance the capacity of officials in both central and local government bodies.

Number of training courses: 26 courses a year

Number of trainees: around 1,200 persons a year

- (2) The Environment Agency has prepared information database concerning environmental education programs carried out in local governments in order to furnish and improve an information network for environmental education.

7. In order to promote the voluntary activities of the private sector to conserve the global environment, the Japanese government established the Japan Fund for Global Environment (JFGE) so as to support NGO's activities through financial and other aids.

- (1) Financial support to NGO's : Environmental activities in developing countries, Environmental activities carried out nationwide in Japan.
- (2) Support to NGOs by means of providing information, training, etc.

In FY1993, 81 projects were adopted (Total: 292 million yen).

8. The Global Environment Research Program was established in 1991, in order to promote the research on the global environment both multidisciplinary and internationally, with mutual coordination and cooperation among national research institutes, universities and other research organizations. The total budget for the Program in the FY1993 is 2,100 million yen (about \$20 million).

Research areas: (1) Depletion of the ozone layer, (2) Global warming, (3) Acid precipitation, (4) Marine pollution, (5) Loss of biodiversity, (6) Tropical deforestation, (7) Desertification, (7) Others.

Table. Numbers of Universities Related to the Environment.

Univ.	Faculty	Department	Student
National Univ. *	(61) 97	101	(200 courses)
Public Univ. **	( 2) 2	2	89
Private Univ. **	(17) 18	18	2,095

By Ministry of Education (\*:FY1992, \*\*:FY1993)

Societies for Environmental Education:

- (1) The Japan Environmental Education Forum  
(TEL: 0551-48-4380, FAX: 0551-48-4980)
- (2) The Japanese Society of Environmental Education  
(TEL/FAX: 048-831-0044)

**KOREA, REPUBLIC OF***Chung, Kuk Hyun***INTRODUCTION**

Distinguished Participants, Ladies and Gentlemen,

It's a great pleasure for me to participate in this meeting. I would like to express my honor for the efforts of UNEP members in preparing this meetings, and also my respects to the participants who have made many contributions to the improvement of environmental education & training in their countries.

I am convinced our earnest and valuable discussions during this meeting will greatly contribute to the improvement of environmental education & training in Asia & the Pacific and the development of NETTLAP.

Korean has been confronted with many environmental problems with the rapid growth of economy. Under the national consensus that environment not be sacrificed for economy any more, we are struggling for the improvement of environment. Especially, we are doing our best for this purpose with the consciousness that in the long run the most important section is that of education & training.

For the effective and developmental education & training, the cooperation between related sphere in regional scale is important, and in this respect this meeting may have important meaning.

**PRESENT STATUS OF ENVIRONMENTAL EDUCATION & TRAINING IN KOREA****Environmental Education & Training for Governmental Officials**

Korea has 46 governmental officials training institute and among these institutes "Environmental Officials Training Institute (EOTI)" is the unique one which wholly concerns environmental training. EOTI started as the Pollution Protection Division in National Institute of Health under the Ministry of Health and Social Affairs as explained in the attachment. Training Division was established under the National Institute of Environmental Research in 1980, and EOTI has been established with 3 divisions and 35 personnels in 1992 with separating from National Institute of Environmental Research.

EOTI has two training parts; one is governmental officials training part and the other is civilians training part, and among 28 training courses 16 training courses are for governmental officials. Some typical courses are as follows:



- Advanced Courses in Environmental Administration is to assist junior official who works in the area of environmental administration, and its goal of training is to improve the capacity of making and carrying out environmental policy.
- Wastewater Treatment Facility Operation Course is for governmental officials who work in wastewater treatment facility, and its training contents are about the wastewater treatment technologies and the skills needed to maintain these facilities.
- Motor Vehicle Emission Test Course is for governmental officials who control motor vehicle emissions, and its training contents are about the control technologies for motor vehicles and the technics for measuring its emission gases.

EOTI has educated about 1,800 governmental officials and 3,800 civilians in 1993, and has educated about 28,000 governmental officials and civilians from 1980 till 1993. For the fostering of specialists who can cope with diverse environmental problems and for the strengthening of educational capacity of EOTI toward the increasing request of training at the rate of 20% a year, EOTI has a long term development plan with enlarged organization and personnels in a new building site.

#### **Environmental Education & Training for Civilians in Environmental Area**

The legal training for civilians is regulated in the eight environmental acts which requires the legal trainings every 3 years for technical staffs working for environmental companies. Legal trainings are done by EOTI, Fisheries Officials Training Institute, Korea Environmental Preservation Association, Korea Marine Training and Research Institute and Korea Toxic Substances Management Association. The training for civilian technical staffs is done through 12 courses. Some typical courses are as follows:

- Advanced Technology Training Course is for the technical expert and professor. The training contents are about the direction of environmental policy, special technologies of environmental management and impact assessment and so on.
- Air Pollution Control Facility Designing Course is for civilian technical staffs working in air pollution control facility designing company, and the training contents are about technology of designing and installation.
- Water Pollution Analysis Course is for civilian technological staffs working for self measuring company and the training contents are about the measuring technics.

Korea Environmental Preservation Association has been training environmental managers working in emission facilities from 1983 and lump-sum waste generator from 1993. Korea Toxic Substances Management Association has been training manager of toxic substances since 1991. Fisheries Officials Training Institute and Korea Marine Training and Research Institute has been training pollution protection manager of all kinds of vessels. The reason for separating the training institutes for civilians is the consideration of such training conditions as specialty, facility, instruments and instructors each institute has.

## **Social and School Environmental Education**

In dealing with environmental problems, in addition to the role of special technical staffs, environmental consciousness and practicing in every day life by citizens would be more important. So government and many civilian organizations have been running programs for those purposes, and EOTI also has been running the program for housewives since 1993.

Ministry of Environment has been administrating "Environment Preservation Model School" for the early achievement of environmentally desirable sense of value since 1985. Eight model schools are on the running in 1993. For the effective operation of model school, about 4,800 dollars of financial assistance and educational material for student, guide material for teacher, educational material for on the air and instructor are provided to each school by government.

- Though environmental education in school is now conducted as some chapters in a textbook, it will be done as an independent curricula from 1995 in middle school and from 1996 in high school, and the contents of environmental materials for primary school and kindergarten will also be strengthened.

So far I took a look at the status of environmental educations and training in Korea. I believe each participating country has been running environmental education & training system effectively of their own, and anticipate that the mutual assistance and exchange of useful informations would be sought out through this kind of meeting to develop NETTLAP of UNEP. Now I would like to give some explanations about the plans of Korea and give some suggestions for the development of this project as follows.

## **Suggestions for the Improvement of Environmental Education and Training in Asia and the Pacific**

### **Plans for Korea's part**

1. The possibility of preparing program for the education and training of the environmental staffs in Asia from 1994 is under investigation by Korean Government.

- Environmental problems and their countermeasures in Korea may be useful as a case studying materials for the Asian countries rapidly industrializing to cope with the same problems effectively.

### **Suggestions for UNEP's part**

1. Distribute pamphlets, VTR films produced by UNEP, other international organizations, universities and research institutions to NFPs.

- NFPs can utilize these materials for themselves and can distribute to Network members and other institutions as valuable materials.

It can also be possible to give materials produced by each NFP to UNEP for other NFPs.

Considering that our institution educated and trains more than 5,000 persons a year, distributions of these materials can be used effectively.

2. Distribution the case study materials of pollution control in particular nations to the NFPs.

- In a vast region, Asia & the Pacific is may have very diverse experience in this part.

It may be a very valuable know-hows, especially, for the rapid industrializing nations.

3. Strengthen the role of UNEP as a guide and information collecting center.

- UNEP need to improve its ability as a guide, information pool, convention center.

4. In addition to existing three thematic area, the area of ecology will be added to this project.

- Asia and the Pacific region has many ecologically valuable places, and especially the research on this thematic area requires international cooperation.

5. Distribute a kind of News Letters to NFPs, SFP s and NETTLAP members.

- By producing News Letters periodically or nonperiodically, recent informations about environmental education & training can be shared by those who want these informations.

#### **For the Role of NFPs, SFPs and NETTLAP members**

1. to increase mutual cooperation between each NFP, the constant contact system in a horizontal concept should be constructed.

- For this purpose personal exchanges on the working-level official in charge must be activated.

2. Exchange of experts and mutual assistance of environmental equipments for particular part of environmental education & training is necessary.

- Each country has different technical & economical capacities. So it is needed to assist filling the gap by exchanging experts and equipments.

attachment : "Environmental Officials Training Institute"

## ENVIRONMENTAL OFFICIAL TRAINING INSTITUTE

### 1. Location

Address : 280-17 Bulkwangdong Eunpyungku, Seoul, Korea  
Phone : (82-2) 389-8716  
Fax : (82-2) 382-4235

### 2. Goals

Throughout the training of both government officials and civilians related to the environmental affairs, this institution intends to make them contribute to enhance the environmental quality of the society.

### 3. Brief History

- Jan. 1967 Started as the Pollution Protection Division in National Institute of Health under the Ministry of Health and Social Affairs
  - Jan. 1978 Established as the National Environmental Protection Institute
  - Jan. 1980 Established Training Division in the National Institute of Environmental Research (1 Division, 7 Personnels)
  - Oct. 1986 Upgraded to National Institute of Environmental Research
  - Jan. 1990 Established Environmental Training Department in the National Institute of Environmental Research (2 Divisions, 25 Personnels)
  - Jan. 1992 separated from National Institute of Environmental Research and Established Training Institute of Environmental Officials (3 Divisions, 35 Personnels)
- \* Renamed as Environmental Officials Training Institute from the date of 15th of October 1993.

### 4. Organization and Personnel

- Organization

## - Personnel

Total	Administrative Staff	General Service Staff
35	26	9

## 5. Facilities

Subject	Rooms	Space (M <sup>2</sup> )	Commodity (person)
Class Room	4	349	175
Auditorium	1	143	100
Seminar Room	2	67	30
Laboratory	2	202	50
Office Room	8	404	35
Recreation Room	3	185	55

## 6. Training courses

Category		Training Courses	period (weeks)
Government Officials	Basic Training	Advanced Course in Environmental Administration	3
		Intermediate Course in Environmental Administration	2
		Primary Course in Environmental Administration	3
	Special Training	Wastewater Treatment Facility Operation course	1
		Sanitary Treatment Facility Operation Course	1
		Solid Waste Treatment Course	1
		Environmental Impact Assessment Course	2
		Hazardous Substance Management Course	1
		Motor Vehicle Emission Test Course	1
		Noise and Vibration Test Course	1
		Air Pollution Inspection and Test Course	1
Water Pollution Inspection and Test Course	1		

	Specified Hazardous Pollutants Analysis Course	3
	Instrumental Analysis & Operation Course	3
	Pesticides Residue Analysis Course	2
	Discharge Facility Management Course	2
Civilians	Advanced Technology Training Course	1
	Air Pollution control Facility Designing course	1
	Water pollution Control Facility Designing Course	1
	Noise and Vibration Pollution Control Facility Designing Course	1
	Air Pollution Analysis Course	1
	Water Pollution Analysis Course	1
	Environmental Impact Assessment Course	1
	Specified Waste Treatment Course	1
	Specified Waste Manager Training Course	2 days
	Sanitary Treatment Training Course	2 days
	Sanitary Treatment Facilities Designing Course	1
	Marine Pollution Prevention Course	1

## 7. Training Achievement

Years	Total	Government Officials	Private Company Employees
1980	386	108	278
1981	486	486	-
1982	529	529	-
1983	722	569	153
1984	902	630	272
1985	1,144	813	331
1986	1,202	932	270
1987	1,615	1,367	248
1988	1,908	1,081	827

1989	2,195	1,296	899
1990	2,979	1,489	1,490
1991	3,293	1,494	1,799
1992	4,557	2,557	2,000
1993	5,676	1,874	3,802
Total	27,594	15,225	12,369

## 8. Development Plans

For more efficient and effective environmental training and education, we are planning to move the new building site with renewed organization and enlarged personnel by the year of 1997. Though definite plans are not determined, the outlines are as follows:

- . Total Size of Land: 82,500 m<sup>2</sup>
- . Total Floor Space: 20,790 m<sup>2</sup>
- . Total Personnel: 83 persons

## MALAYSIA

*M.B. Awang*

## 1. Academic Linkages and Cooperation

Current scenario (ASAIHL, 1992):

- there is a rising demand for environmental education to match the economic expansion prevailing in the region
- the countries remain dependent on the assistance and cooperation of developed countries to meet this demand for the next decade
- the educational infrastructure of the Pacific Basin countries remains relatively slow in responding to the tremendous rise and the varied demand for trained and skill manpower by industrial sector i.e. huge expansion of industries and manufacturing in these countries is not commensurate with the expansion of educational opportunities
- the countries will continue to strive to expand and to improve their educational infrastructure through larger allocation of funds, training of teachers, and provision of state-of-the-art coursewares
- the commitment to educational cooperation between institutions and countries will remain a major agenda for the CEO's and managers of the educational establishments in the Pacific Region
- in order to ensure that academic programmes are relevant and attain high academic excellence, the universities undertake the following strategies :
  - a) securing academic consultants/advisors from amongst renown professors in the international academic world
  - b) appoint faculty advisory boards for each faculty
  - c) appoint academic associates for students' practical training supervision
  - d) appoint external examiners and assessors for each academic programme and
  - e) forging cooperative linkages with other universities and agencies

Activities directed at strengthening tertiary institutions and enhancing the environmental knowledge and skills of staff :



## 1. Academic programmes

- over the last two decades universities in Malaysia achieved a very strong and eminence in educational set up through strong reliance on inter-institutional, intra- and inter-regional linkages established between educational bodies.
- institutional linkages include;
  - a) assistance in creation of undergraduate study programme
  - b) consolidate and expansion of some traditional programmes which offer a wider applied specialization programmes
  - c) developing a large scale of postgraduate programme for all disciplines as well as developing an infrastructure to enhance research activities

## 2. Staff training

- a) higher degree staff training - through bilateral or multi-lateral understanding with several institutions
- b) staff exchange done through visiting assignments, study visits, attachment visits or fellowships.
- c) a similar approach adopted for technical assistance

## 3. Research

- a) collaborative research established through MOU between national and international institutions and agencies. This agreement not only provides staff exchange and study visits but also acts as a forum for the promotion of cooperation between the universities.

## 4. Conferences, Workshops and Seminars

- a) National Perspectives

## Present Experience and practices (Ramphal and Ismail, 1993)

Universities in Malaysia offer both formal and informal environmental education courses to students pursuing diverse educational programmes. These include courses in Environmental Pollution and Environmental Management in the School of Biological Sciences, Chemistry and Environmental Pollution in the School of Chemical Sciences at the Universiti Sains Malaysia. Courses in sewerage and waste water treatment and hydrology are offered on a regular basis and on solid waste management and environment impact assessment on an ad hoc basis at the University of Agriculture Malaysia. While environmental health related courses are offered at the National University Malaysia. Environmental Health is also incorporated into the teaching of the community health at all three medical schools in the country and in the Master of Public Health course offered at the University of Malaya. The University of Technology Malaysia has developed a post graduate degree in environmental engineering while also offering environmental engineering programme at the undergraduate level. A similar approach has been adopted in University of Agriculture Malaysia. Short

courses on environmental pollution/management/health-related subjects are offered periodically to the interested general public and industry.

**Marine and Environmental Science Education Relevant to Coastal Area Management (CAM) and Planning in Malaysia (Ibrahin, 1991)**

CAMP is a fairly new concept in Malaysia. The need for integrated management for coastal resources and habitats has only been realized by the government after many of them have already been heavily depleted and degraded. At the regional level, Malaysia and its SEA neighbors jointly undertaken marine science research through in ASEAN Working Group on Marine Science, established in 1978. The venture with support from Australian, Canada and US, develop research, management and training programmes in marine sciences with emphasis on resources assessment and coastal management.

Much of the training and education relevant to coastal zone management (CZM) have been derived from the various conventional disciplines such as zoology, botany, geography, engineering, chemistry and physics. The management strategy used was sectoral. The first steps towards an integrated approach to CZM at the tertiary level took place in the mid-1970s.

The first local degree course in Environmental Sciences was established in 1978 and the first faculty of Fisheries and Marine Sciences, in 1979. Both were set up in the University of Agriculture Malaysia. The courses relevant to marine and environmental sciences are also offered from other universities in Malaysia (Table 1). There is a need for increased emphasis on coastal engineering and the specific conditions of the coastal area.

Topics which should be strengthened are Marine Pollution, EIA and Marine Affairs. The legal process of EIA is new in Malaysia and expertise is only starting. There are fewer opportunities for marine pollution studies which usually have a more expansive coverage than landbased and freshwater pollution studies. Marine affair has traditionally been tackled in legal or shipping studies. It should be integrated into Environmental Policy or coastal management courses. Planning tool and resources management deals with general techniques, such as aerial photography, interpretation, modelling, forestry or agricultural management. More case studies on coastal areas need to be incorporated.

**Environmental Economics (Refer to Dr. Nasir Hassan)**

- A number of courses related to environmental economics which are currently being taught at the undergraduate and postgraduate levels at higher institutions in Malaysia.
- currently UPM offered courses in the Department of Environmental Sciences and the Department of Natural Resource Economics

- is taught in the second stage where students are required to take core subjects which would eventually lead them to a specialized disciplines. Student could either specialized in environmental Technology or Environmental Management and for both areas, students are required to take a subjects on environmental economics, which is referred to applied environmental analysis
- Specialized course related to environmental economics offered by the faculty of Economics include Planning and Development Economics, Natural Resource Economics, Planning and Evaluation of Projects, Land Economics and Water Resource Economics
- related course offered by other faculties, i.e. Forestry : Wildlife Management and Protection, Recreation and Wildlife Management and Forest Economics

Malaysia would like to have the following programmes :

- a) assessment of the existing programmes and courses offered at the various Malaysian universities to put into a proper perspective especially in Environmental Economics, Coastal Zone Management and Solid Waste/Toxic Chemicals.
- b) assisting staff in tertiary institutions - especially teaching teacher; training college with the cooperation of the local universities - in providing/preparing teaching materials and modules for "secondary school teachers".
- c) developing interdisciplinary environmental training courses which explicitly recognize the need for integrated approaches
  - target groups :
  - environmental agencies officers and managers
  - project proponents & industrialist
  - local municipalities/city council
 with special emphasis on :
  - a) chemicals toxic & hazardous waste
  - b) environmental auditing/assessment of environmental damage due to oil spillage, excessive exploitation of natural resources, environmental pollution, etc.
  - c) curriculum development in the field of
    - Environmental law - for graduate and postgraduate diploma programme.
    - Risk assessment and management
  - d) to set up environmental research and training centre in Malaysia functioning as a coordinating body under the auspices of UNEP
    - currently DOE and University of Agriculture Malaysia are proposing to the Malaysia government to set up centre through JICA funding

**PHILIPPINES***Amelia Dulce D. Supetran*

In the Philippines, foreign environmental training which tertiary level institutions currently avail of are under 10 bilateral programmes and 13 technical cooperation programmes. Fields of training include:

- Remote Sensing;
- Resources planning;
- Integrated Resource Surveys;
- Geological Studies;
- Hydrology;
- Environmental Engineering;
- Sanitary Engineering; and
- Environmental Science and Technology.

Currently, there are several training programmes being conducted for governments, tertiary level academic institutions and non-governmental organisations, among which are the following:

1. UNDP-EMB Human Resources Development on Environmental Planning and Management for Sustainable Development;
2. CIDA-IESAM Environmental Resource Management Project;
3. AIDAB-DENR (NRMDP) Training Program on Environmental Management;
4. WB-DOST Science and Technology Environmental Education Project; and
5. USAID-DENR (CITE) - Communication, Information and Education Program.

Under the National Environmental Education Action Plan (NEEAP), a program for Tertiary Education and Specialist Training has been drawn up with the following components:

1. Curriculum and Materials Development
2. Research and Development
3. Training
  - Specialist Training (government specialist and university faculties)
  - Tech. Voc. Teachers Training
  - Seminars and Workshops on EE
4. Information, Education, Communication and Social Advocacy Program
5. Scholarship Program and
6. Lending program for Facilities and Equipment Upgrading

**Summary of Environmental Science/Management Courses  
Offered by Selected Schools**

**Interdisciplinary/Integrated Courses**

	UP IESAM	UP SURP	UP CE	UP DG	PWU	MIRIAM College	UP Manila	UPLB CHE	UP CAS*	Total Number Schools
1. Degree Programs										
Environmental Science									Ph.D.	1
Environmental Studies	MS									1
Environmental Engineers			MS							1
Urban/Regional Planning		MA Ph.D.								1
Environmental Management					MA					1
Geography				BS,MS						
Environmental/Public Health							BS,MS Dr.PH			1
Environmental Planning						BS		BS		2
2. Non-Degree Courses										
1. Town Planning		x								
2. Environmental Studies	x									
3. Water Treatment Plant Design			x							
4. Air Pollution Control			x							
5. Solid Waste Management			x							
6. EE for Teachers					x					

\* Now College of Science (CS)

**Summary of Environmental Science/Management and Related Courses Offered by Selected Schools  
Disciplinary and Specialist Courses**

**ACADEMIC INSTITUTIONS**

	UP DMO	UP NIGs	UP MSI	UPLB CF	UPLB CEM	CPU	WVSU	UPV	CVPC	SU	CSSA	BSU	USC	MMSU	MSU	XU	UPLB CA&CAS	CMU	BU	AD	UM	No. of Schools	
1. Degree Programs																							
Agriculture						BS	BS									BS	BS MS Ph.D.						4(19%)(MS) 1(5%)(MS&Ph.D)
Geology		BS MS Ph.D.																					1(5%)(BS) 1(5%)(MS&Ph.D)
Forestry				BS MS Ph.D			BS				BS	BS MS		BS				BS			BS		7(33%)(BS) 2(9%)(MS) 1(5%)(Ph.D)
Biology						BS	BS	BS		BS MS			BS MS		BS	BS	BS MS Ph.D.	BS		BS MS			10(48%)(BS) 2(9%)(MS) 1(5%)(Ph.D)
Marine Science			MS Ph.D																				1(5%)(MS) 1(5%)(Ph.D)
Meteorology	MS Ph.D																						1(5%)(MS) 1(5%)(Ph.D)
Fisheries								BS MS	BS														2(10%)(BS) 1(5%)(MS)
Agricultural Economics					BS MS Ph.D																		1(5%)(BS) 1(5%)(MS) 1(5%)(Ph.D)
Marine Biology								BS					BS			BS							3(14%)(BS)
Forest Engineering															BS								1(5%)(BS)
Agroforestry																				BS			1(5%)(BS)

## SINGAPORE

*Dr. Andy Hor Tzi Sum*

Environmental pollution is often an acutely serious side-product of rapid economic an/or technological development of any society. Singapore is well aware of these parallel trends and hence places on its national agenda the importance in protecting the quality of our living environment. Two government ministries are directly involved in various environmental protection and educational programme, namely the Ministry of Environment and Ministry of Education. The former works closely with the Ministry of National Development on the environmental issues related to urban planning. It is responsible for all the environmentally-related operations such as refuse collection and disposal, toxic wastes treatment, air pollution monitoring and control etc. The Ministry of Education oversees the various educational programme run by the two universities - the National University of Singapore (NUS) and Nan Yang Technological University (NTU), four polytechnics (Singapore, Ngee Ann, Temasek and Nan Yang) and the Institute of Technical Education. Being a highly urbanized city state. Singapore puts great emphasis in its educational programme on issues such as :

- a) planning of a green city
- b) the origins of air pollutants and their control
- c) domestic refuse disposal and planning
- d) toxic wastes assessment and management
- e) coastal zone management
- f) environmental economics
- g) water conservation, purification and sewage treatment

Theses are in line with the thematic networks currently in place under NETTLAP in the UNEP. Professor L.M. Chou of NUS is the coordinator of the network "Coastal Zone Management" and Prof. J.-H. Tay of NTU the representative of "Toxic Chemicals & Hazardous Wastes". Environmental educational courses are interdisciplinary in nature and are currently conducted by several faculties in the universities and other tertiary institutes. In the Faculty of Science in NUS for example, biological science students are taking courses related to marine life and rain forests. In the Department of Chemistry in NUS, Environmental Chemistry is a subject taught in the final year programme. Various environmental analytical and monitoring techniques are taught throughout the four (3+1) year B.Sc. Honours programme. The Environmental Engineering Group of the Department of Civil Engineering in NUS offers annually two high level short courses. These are "Industrial Waste Treatment and Disposal" and "Toxic and Hazardous Wastes Management". The former course aims to create an awareness of industrial waste pollution problems among industrialists. The latter is designed for the benefit of those involved in handling, storage, transfer and transport, treatment, disposal and management of the toxic wastes. The same Department organized a seminar on "Trends in Environmental Education Worldwide" last September. An important conference "5th Symposium on Our Environment" is being planned

for 1995 in Singapore. It is jointly organized by the Department of Chemistry in NUS and the Singapore National Institute of chemistry. The organizing members include chemists, engineers, geographers, biologists and other environmentalists. National campaigns on environmentally beneficial topics are frequently organized by the government bodies. Singapore Science Centre is committed to educate the public on the value of environmental protection. Non-governmental organizations such as Singapore Nature Society are organizing field trips and other environmental activities. The various parks around the city (including the Bukit Timak Nature Reserve) and the Zoological Garden are part of the government plan to create a better living environment for the people.



## THAILAND

**Environmental Training in Thailand***Dr. Suphavit Piamphongsant*

Environmental training at tertiary level can be classified as:

- a) academic training of environmental professionals which includes training of environmental and natural resource planners, environmental scientists, environmental social scientists, environmental engineers, engineers who work in environment-related area, specialists in environment-related fields such as chemists, environmental biologists, forestry scientists, as well as training of teachers of environmental education. Most universities offer bachelor and master degree programmes. A few universities offer Ph.D. programmes in some fields related to the Environment.
- b) short-term training on specific themes: In the past, several training courses have been organized by some universities. Courses already organized include
  - 1) integrated watershed management
  - 2) coastal zone management
  - 3) air and water pollution control, etc.

However, a majority of the training courses have been organized by 1) Office of the National Environment Board (upto 1992) and subsequently by 2) the Environment Research & Training Center, Department of Environmental Quality Promotion. It is envisaged that 25 short term training programmes with the involvement of tertiary institutions are to be offered each year by the Center, covering environmental management, natural resources, environmental technology, wastes and environmental pollution, man and the environment.

The representative from Thailand expressed the fear that in the near future there could be an oversupply of environmental scientists, who are trained as generalists or integrationists, owing to the facts that 1) there is now a clear distinction between agencies dealing with pollution control and agencies dealing with individual natural resources, i.e. soil, forests, water, mineral resources, fisheries, etc. 2) there is only one planning agency at national level, i.e. Office of the Environmental Policy and Planning whose manpower is limited. He suggested, among others, that there is a need to incorporate environmental education and training into existing curricula for those graduates who are supposed to be work in the development related sectors. He further proposed that there should be training courses for environmental communicators, i.e those who work towards promotion of environmental awareness.

UNITED NATIONS ENVIRONMENT PROGRAMME

REGIONAL OFFICE FOR ASIA AND THE PACIFIC

ABRIDGED REPORT ON FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL IN  
TOXIC CHEMICALS AND HAZARDOUS WASTE MANAGEMENT

Bangkok, Thailand  
September 28-30, 1993

The following is a summary report on the above workshop, conducted by the *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*.

**Workshop Objectives:**

- to elaborate the curriculum objectives and resulting curriculum guidelines and content relevant to education and training activities related to toxic chemicals and hazardous wastes at the tertiary level in the Asia-Pacific region
- to develop practical and focused instructional materials to support the implementation of the specific education and training activities identified above
- to identify and demonstrate instructional aids used to support the teaching and training activities identified above.

**Implementation:**

Five resource persons and 15 participants were identified and invited to participate in the workshop (see attached list of participants and resource persons). All 15 participants attended the full workshop.

The resource persons met in Bangkok the day prior to the workshop in order to finalise responsibilities and arrangements. The workshop was conducted over three days, from 0830 to 1700 hours (see attached programme). The day after the workshop the available resource persons met to discuss the participants' formal evaluations, provide their own informal evaluations, discuss the follow-up tasks related to the workshop outcomes and to consider further training activities and the overall work programme of NETTLAP.

**Workshop Outcomes**

- 15 participants with enhanced understanding of education and training related to toxic chemicals and hazardous wastes and now equipped with relevant instructional materials and aids

- 5 resource persons and Network Coordinator with increased awareness of the needs and opportunities for training tertiary level staff in methods and materials related to education and training in toxic chemicals and hazardous wastes
- curriculum objectives, guidelines and content relevant to education and training activities related to toxic chemicals and hazardous wastes at the tertiary level in the Asia-Pacific region
- case studies and other instructional materials to support education and training activities in toxic chemicals and hazardous wastes at the tertiary level in the Asia-Pacific region
- a draft workshop report (see attached Table of Contents) which will, upon completion and dissemination, provide tertiary staff with instructional materials and information on instructional aids relevant to education and training activities related to toxic chemicals and hazardous wastes in the Asia-Pacific region
- recommendations prepared by the workshop participants (see Document UNEP/ROAP/RCM/93/4)
- an opportunity for workshop participants to obtain a formal Certificate of Completion upon meeting the specified requirements (see attached). The requirements were designed to encourage participants to apply the information and understanding they had gained at the workshop. This would likely be by conducting courses in which the curriculum guidelines, instructional materials and instructional aids are applied

### **Workshop Evaluation**

Each participant completed a formal evaluation of the workshop and submitted this during or immediately after the final session.

A preliminary analysis of the evaluations provided by the participants (see following page) reveals that the majority viewed the workshop as:

- VERY GOOD in satisfying the participants' personal needs for professional development
- VERY GOOD regarding the printed materials provided
- EXCELLENT with respect to organization and execution
- VERY GOOD regarding usefulness of information, methods and instructional tools
- EXCELLENT in terms of the likely usefulness of the printed and other materials for future professional activities
- VERY GOOD in terms of an overall evaluation of the workshop
- VERY GOOD to EXCELLENT regarding usefulness to a tertiary level educator
- VERY GOOD regarding the usefulness of the software and databases demonstrated in the workshop

Most participants considered the services and facilities for the workshop to be SATISFACTORY or VERY GOOD.

All but one participant said they would consider participating in a follow-up workshop. The same people also thought that the subject matter of the current workshop would be beneficial to other individuals in their institution or country.

The following topics were listed as "most interesting" by at least one participant -

Software packages for teaching and training (7)  
Computer databases (6)  
Teaching packages (4)  
Basel Convention as presented by P. Portas (2)  
Country case studies (e.g. Vietnam) (2)  
Video tapes (2)  
Computer assisted learning packages (2)  
IRPTC presentation by R. McFarlane  
Training methods  
Coverage of TCHW topics in Engineering  
Illustrative transparencies  
Current regional issues  
Identification of toxic chemicals and of hazardous wastes  
Disposal techniques  
Law and legislation

Somewhat less helpfully, one participant commented - "everything that was done in this workshop was interesting".

The following comments were offered when participants were asked to identify what was "least interesting" about the workshop content -

Tendency of participants to deviate from major objective of the country case studies  
Simple explanation of the status of each country was below a tertiary level  
Involvement in TCHW processing of each country was not clear, including the technical contents

Off topic presentations - e.g presentation of research findings instead of teaching methods

In all only three participants identified aspects of the course they found "least interesting".

The workshop resource persons considered that the workshop had fulfilled the immediate objectives, but noted the following:

- additional time should have been allocated to participant familiarization with software, databases and other educational and training aids
- additional time should have been allocated for discussion amongst participants and with resource persons
- participants should have been asked to ensure that they focus on education and training methods and resource materials, rather than spending time on description of national status or research studies

### **Overall Conclusions**

- the workshop was a valuable learning and awareness raising experience for the 15 participants
- the workshop demonstrated that this approach to training meets an important regional need in an effective manner

- the workshop is an efficient mechanism for other agencies and organizations (e.g. UNEP/IRPTC, UNEP/SBC) to familiarize educators and trainers with their activities and products and to in turn transfer this awareness and understanding to key people in the public and private sectors
- the workshop is an effective means for identifying and developing materials and aids that can receive widespread distribution to tertiary institutions in the region

John E. Hay

Coordinator

*Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*

**CONTRIBUTIONS TO  
THE MANAGEMENT OF TOXIC CHEMICALS AND HAZARDOUS WASTES  
IN THE ASIA-PACIFIC REGION**

**REPORT OF THE FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL  
IN TOXIC CHEMICALS AND HAZARDOUS WASTES**

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UNITED NATIONS ENVIRONMENT PROGRAMME  
REGIONAL OFFICE FOR ASIA AND THE PACIFIC  
ABRIDGED REPORT ON FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL IN  
ENVIRONMENTAL ECONOMICS

Singapore  
October 5-7, 1993

The following is a summary report on the above workshop, conducted by the *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*.

**Workshop Objective:**

- to develop practical and focused instructional materials which reflect current and anticipated needs in the Asia-Pacific region with respect to education and training in environmental economics at the tertiary level

**Implementation:**

Five resource persons, 16 participants and two observers were identified and invited to participate in the workshop (see attached list). In the final event, three resource persons, 13 participants and 2 observers attended the workshop.

The workshop was held at the Singapore World Trade Centre in conjunction with EnvironmenxAsia, an international conference and exhibition with the title "Environmental Technology and Economics - the New Competitive Strategy". Participants attended the opening session of the conference where two relevant papers were presented:

*Global Emerging Issues* by Mr H. Abaza, United Nations Environment Programme, Nairobi

*Tradeable Rights in Ozone Depleting Substances - New Zealand's Approach* by Dr. B. Sharp, Department of Economics, University of Auckland, New Zealand and Coordinator of NETTLAP's Thematic Network on Environmental Economics

The resource persons met in Singapore the day prior to the workshop in order to finalise responsibilities and arrangements. The workshop was conducted over three days, from 0830 to 1700 hours (see attached programme). The day after the workshop the resource persons met to discuss the participants' formal evaluations, provide their own informal evaluations, discuss the follow-up tasks related to the workshop outcomes and to consider further training activities and the overall work programme of NETTLAP.



### Workshop Outcomes

- 13 participants with enhanced understanding of education and training related to environmental economics and now equipped with relevant instructional materials
- 3 resource persons and Network Coordinator with increased awareness of the needs and opportunities for training tertiary level staff in methods and materials related to education and training in environmental economics
- case studies and other instructional materials to support education and training activities in environmental economics at the tertiary level in the Asia-Pacific region
- a draft workshop report (see attached Table of Contents) which will, upon completion and dissemination, provide tertiary staff with instructional materials relevant to education and training activities related to environmental economics in the Asia-Pacific region
- recommendations prepared by the workshop participants (see Document UNEP/ROAP/RCM/93/4)
- an opportunity for workshop participants to obtain a formal Certificate of Completion upon meeting the specified requirements (see attached). The requirements were designed to encourage participants to apply the information and understanding they had gained at the workshop. This would likely be by conducting courses in which the instructional materials and other workshop outputs are applied

### Workshop Evaluation

Each participant completed a formal evaluation of the workshop and submitted this during or just after the final session.

A preliminary analysis of the evaluations provided by the participants (see following page) reveals that the majority viewed the workshop as:

- VERY GOOD in satisfying the participants' personal needs for professional development
- VERY GOOD regarding the printed materials provided
- EXCELLENT with respect to organization and execution
- VERY GOOD regarding usefulness of information, methods and instructional tools
- VERY GOOD in terms of the likely usefulness of the printed and other materials for future professional activities
- VERY GOOD in terms of an overall evaluation of the workshop
- VERY GOOD regarding usefulness to participant as a tertiary level educator

Most participants considered the services and facilities for the workshop to be SATISFACTORY or VERY GOOD.

All participants indicated that they would consider participating in a follow-up workshop. Only one participant thought that the subject matter of the current workshop would not be beneficial to other individuals in their institution or country.

The following "topics" were listed as "most interesting" by at least one participant -

Economic tools and instruments for environmental management (3)  
Provision of instructional materials and teaching aids (3)  
Interaction with other participants (3)  
Valuation techniques (2)  
Organization (2)  
General structure and topics of the workshop (2)  
Policy instruments and environmental accounting  
Case studies  
Country case studies demonstrating efforts being made to address environmental concerns,  
and the problems encountered in doing so  
Exchange of academic ideas  
Role of economics in sound and sustainable development in Asia-Pacific  
Research findings, methodologies and issues - these strengthen theoretical analysis  
Selected presentations

The following comments were offered when participants were asked to identify what was "least interesting/successful" about the workshop content -

Selected presentations  
Curriculum guidelines  
Lack of discussion concerning topics to be covered, target audiences, tools and instruments  
for teaching, curriculum and syllabus  
Lack of strong theoretical perspective from an economist's point of view  
Country reports which are non-academic in nature  
Failure of some participants to join in discussion  
Should concentrate more on specific examples

The workshop resource persons considered that the workshop had fulfilled the immediate objectives. The following points were noted:

- the networking aspects of the workshop are important and they were successful
- there was excellent group chemistry and for this reason alone it would be useful to involve the participants in on-going activities and convene a follow-up workshop
- regarding the content of the workshop, there is a tension between technical/methodological issues and general, applied, practical perspectives and between specialists in environmental economics and those in environmental management seeking some expertise in environmental economics
- there is strong need, and interest amongst the participants, regarding the production of resource materials such as a text book, but the content and target audience need defining
- some topics (e.g poverty, intergenerational issues) were not covered
- there is a need to build on the strengths that were identified and supported at the workshop
- participants need a clear statement of the workshop objectives
- there is a need for a thematic network on environmental education and training - amongst other tasks, such a thematic network could service the other thematic networks
- more use could have been made of expertise and other resources (e.g. reports) from UN and other organizations

**Overall Conclusions**

- the workshop was a valuable learning and awareness raising experience for the 13 participants
- the workshop demonstrated that this approach to training meets an important regional need in an effective manner
- greater use needs to be made of the workshop by other agencies and organizations (e.g. UN Statistics Office, Sustainable Development Commission) to familiarize educators and trainers with their activities and products and to in turn transfer this awareness and understanding to key people in the public and private sectors
- the workshop is an effective means for identifying and developing materials and aids that can receive widespread distribution to tertiary institutions in the region

John E. Hay  
Coordinator

*Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*

**CONTRIBUTIONS TO  
ENVIRONMENTAL ECONOMICS IN THE ASIA-PACIFIC REGION**

**REPORT OF THE FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL  
IN ENVIRONMENTAL ECONOMICS**

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**UNEP/ROAP**

**NETWORK FOR ENVIRONMENTAL TRAINING  
AT TERTIARY LEVEL IN ASIA AND THE PACIFIC  
(NETTLAP)**

**FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL IN  
ENVIRONMENTAL ECONOMICS**

**CERTIFICATE OF COMPLETION**

A Postgraduate Certificate of Completion will be awarded to participants who achieve an acceptable standard in the final preparation of their discussion paper. They must also produce official documentation demonstrating that they have used the instructional materials and aids developed at the workshop when conducting a course related to environmental economics in their home country.

UNITED NATIONS ENVIRONMENT PROGRAMME  
REGIONAL OFFICE FOR ASIA AND THE PACIFIC

ABRIDGED REPORT ON FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL IN  
INTEGRATED COASTAL ZONE MANAGEMENT

Cha-am, Thailand  
November 9-11, 1993

The following is a summary report on the above workshop, conducted by the *Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*.

**Workshop Objectives:**

- to select existing tertiary level instructional materials and learning aids related to coastal zone management and initiate any modifications required to make them appropriate for widespread dissemination within the Asia-Pacific region
- to identify specific and currently unsatisfied needs for instructional materials and learning aids related to coastal zone management and initiate development of the required materials and aids
- to assess and develop the tertiary level education and training opportunities associated with the UNEP IE/PAC Sustainable Coastal Tourism Development Project

**Implementation:**

Five resource persons and 14 participants were identified and invited to participate in the workshop (see attached list of participants and resource persons). All resource persons and 11 participants attended the full workshop.

Financial support for the workshop was provided by UNEP/EETU through UNEP/ROAP and by UNEP OCA/PAC. UNEP IE/PAC also assisted by sending a resource person from Paris.

The resource persons met in Cha-am the day prior to the workshop in order to finalise responsibilities and arrangements. The workshop was conducted over three days, from 0830 to 1700 hours (see attached programme). The day after the workshop the available resource persons met to discuss the participants' formal evaluations, provide their own informal evaluations, discuss the follow-up tasks related to the workshop outcomes and to consider further training activities and the overall work programme of NETTLAP.

**Workshop Outcomes**

- 11 participants with enhanced understanding of education and training related to integrated coastal zone management (ICZM) and now equipped with relevant instructional materials and aids
- 5 resource persons and Network Coordinator with increased awareness of the needs and opportunities for training tertiary level staff in methods and materials related to education and training in ICZM
- curriculum objectives, guidelines and content relevant to education and training activities related to ICZM at the tertiary level in the Asia-Pacific region
- case studies and other instructional materials to support education and training activities in ICZM at the tertiary level in the Asia-Pacific region
- a draft workshop report (see attached Table of Contents) which will, upon completion and dissemination, provide tertiary staff with instructional materials and information on instructional aids relevant to education and training activities related to ICZM in the Asia-Pacific region
- recommendations prepared by the workshop participants (see Document UNEP/ROAP/RCM/93/4)
- an opportunity for workshop participants to obtain a formal Certificate of Completion upon meeting the specified requirements (see attached). The requirements were designed to encourage participants to apply the information and understanding they had gained at the workshop. This would likely be by conducting courses in which the curriculum guidelines, instructional materials and instructional aids are applied

**Workshop Evaluation**

Each participant completed a formal evaluation of the workshop and submitted this during or immediately after the final session.

A preliminary analysis of the evaluations provided by the participants (see following page) reveals that the majority viewed the workshop as:

- VERY GOOD in satisfying the participants' personal needs for professional development
- VERY GOOD regarding the printed materials provided
- EXCELLENT with respect to organization and execution
- VERY GOOD regarding usefulness of information, methods and instructional tools
- VERY GOOD in terms of the likely usefulness of the printed and other materials for future professional activities
- VERY GOOD in terms of an overall evaluation of the workshop
- VERY GOOD regarding usefulness to a tertiary level educator
- VERY USEFUL regarding the usefulness of the software and databases demonstrated in the workshop



Most participants considered the services and facilities for the workshop to be VERY GOOD.

All participants said they would consider participating in a follow-up workshop. All but one participant thought that the subject matter of the current workshop would be beneficial to other individuals in their institution or country.

The following topics were listed as "most interesting" by at least one participant -

- field trips (2)
- computer software demonstrations
- coastal resources management training in the Philippines
- various existing education modules
- exposure to various sorts of problems in coastal management
- experience of participants in handling coastal zone issues in individual countries
- participant presentations, given the variety of techniques and methods
- specific topic presentations (e.g. coastal processes, pollution)
- networking with workshop participants
- combining the theory and practice in the laboratory and in the field
- discussion time and the presentations
- materials and methods for teaching graduates and postgraduates
- case studies of coastal management in other countries
- discussion sessions

The following comments were offered when participants were asked to identify what was "least interesting" about the workshop content -

- teaching programmes in other countries which have very little relevance to the workshop objectives
- presentations on general curriculum content (2)
- a few of the talks
- monotone class presentations
- irrelevant topics bearing in mind the objectives of the workshop

The workshop resource persons considered that the workshop had fulfilled the immediate objectives, but noted the following:

- despite every reasonable effort, some of the participants were still unclear about the focus of the workshop; some expected to deal with tertiary training while others still expected the more traditional focus on CZM itself;
- the group was divided into those wanting advice on curriculum content and those not wanting it;
- the participants had difficulty integrating the three aspects of the workshop: present curriculum, problems of CZM and materials for training; they thus had some difficulty identifying ways to incorporate CZM issues into the curricula;

- the expectations of the workshop became blurred as a consequence of the wide spectrum of capabilities of the participants;
- all the participants had a single discipline based background, making it difficult for them to consider the integrated nature of CZM;
- it appears to be difficult for experienced academics to become part of a group or team and for them to work on common issues;
- the participants also appeared to have difficulty separating content and delivery; the latter was the focus of the present workshop
- the workshop objectives were somewhat overly ambitious in that they assumed that participants had access to an existing pool of teaching and training materials; as the workshop progressed it became clear that many of the expected materials were not yet available;
- the workshop programme assumed that participants would present and comment on the materials and methods that might be used and that they would also provide examples based on their experience in CZM; but most of the participants did not have first hand practical experience in CZM;
- the foregoing observations suggested the need for the workshop to include people who have practical experience in CZM and who could give presentations on such topics as conflict resolution, group discussions and facilitation strategies;
- there is a need to build on such practical experience by incorporating it in the training materials;
- future workshops should allocate less time to presentations on curricula and allow more time for discussion of needs and for developing recommendations; and
- more time should be spent on practical demonstrations and on materials to be incorporated in courses.

An important issue identified by the resource persons was how to make participation in the such workshops more meaningful for participants from countries where there is little experience with instruction in English and where there is a markedly different institutional framework. The collective view was that every effort should be made to continue the involvement of these people in regional and sub-regional workshops, but an additional effort was required by offering in-country training activities.

### **Overall Conclusions**

- the workshop was a valuable learning and awareness raising experience for the 15 participants
- the workshop demonstrated that this approach to training meets an important regional need in an effective manner

ANNEX XVIII (Contd.)

- the workshop is an efficient mechanism for other agencies and organizations (e.g. UNEP IE/PAC, UNEP OCA/PAC) to familiarize educators and trainers with their activities and products and to in turn transfer this awareness and understanding to key people in the public and private sectors
- the workshop is an effective means for identifying and developing materials and aids that can receive widespread distribution to tertiary institutions in the region

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*Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP)*

**CONTRIBUTIONS TO  
INTEGRATED COASTAL ZONE MANAGEMENT HAZARDOUS WASTES  
IN THE ASIA-PACIFIC REGION**

**REPORT OF THE FIRST NETTLAP WORKSHOP ON  
EDUCATION AND TRAINING AT TERTIARY LEVEL  
IN INTEGRATED COASTAL ZONE MANAGEMENT**

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**UNITED NATIONS ENVIRONMENT PROGRAMME**

**REGIONAL OFFICE FOR ASIA AND THE PACIFIC**

**Regional Consultative Meeting on  
Environmental Training at Tertiary Level in Asia and the Pacific**

**RECOMMENDATIONS FROM THE FIRST  
NETTLAP RESOURCES DEVELOPMENT WORKSHOPS**

The following recommendations were prepared by the experts attending the three NETTLAP Resources Development Workshops held in the latter half of 1993 -

- Resources Development Workshop for Tertiary Training in Toxic Chemicals and Hazardous Waste Management - Bangkok, September 28-30, 1993;
- Resources Development Workshop for Tertiary Training in Environmental Economics - Singapore, October 5-7, 1993;
- Resources Development Workshop for Tertiary Training in Coastal Zone Management - Cha-am, November 9-11, 1993.

Additional information may be found in NETTLAP Publications Nos. 5-7.

**A. Toxic Chemicals and Hazardous Wastes**

**I. On Role/Activities of the NETTLAP**

- 1.1 NETTLAP should facilitate the build up of a capacity in tertiary education that will contribute to a regional responsibility and a regional identity, in regard to environmental challenges of toxic chemicals and hazardous wastes (TCHW).
- 1.2 NETTLAP should promote the preparation/publication/dissemination of teaching materials related to TCHW tailored to the needs of the region, including translation in different languages in the region.
- 1.3 NETTLAP should, as a UNEP agent, promote the awareness of dissemination of and access to other relevant materials developed by UN bodies and specialized agencies to the tertiary institutions in the Region.
- 1.4 NETTLAP should facilitate the development and implementation of courses and programs on environmental management (both specialized and generic) which involve links between tertiary institutions in the region, particularly between developing and developed countries.

- 1.5 NETTLAP should facilitate the development and implementation of courses and programmes on environmental management as listed in 2.2.

## II. On Role/Activities of the Individual and Institutional Members

- 2.1 The participants endorse the integration of toxic chemicals and hazardous wastes management and prevention in the curricula of tertiary education. Towards this end, the participants agreed to help in promoting cooperation among the participating individuals and institutions in the region specifically in the following activities:
- (a) development of educational tools using learning materials and resources that are suited to the requirements in the countries within the region;
  - (b) adoption of innovative teaching methods such as the use of Computer Assisted Learning/Simulation Process, etc;
  - (c) development of case studies to demonstrate the various management options for TCHW with due respect given to community-defined needs and capabilities;
  - (d) dissemination and use of relevant information materials such as the Basel Convention and APELL guidelines.
- 2.2 A high priority should be given to facilitating and catalyzing courses and programmes which:
- (a) promote the training of people at sub-degree levels such as certification of treatment plant operators, government employees; etc.
  - (b) promote the training of graduates, particularly through programs in science and engineering which build the capacity to implement solutions;
  - (c) promote the training of post-graduate specialists in environmental management, particularly in TCHW;
  - (d) promote continuing education in TCHW;
  - (e) promote the ongoing professional development of staff in tertiary institutions who are involved in environmental education and training.

- 2.3 Specifically, students at tertiary institutions in the Region should be exposed to the three areas of concern in TCHW namely, problem identification, solution identification and solution implementation. Innovative approaches to teaching and learning should be used which include case studies, project work, seminars, plant visits, field trips, etc.

### **III. Networks, Institutions and Organizations**

- 3.1 NETTLAP should establish linkages with other networks within the region for the purpose of assisting in the exchange of Faculty members and students between developing and developed countries.
- 3.2 UNEP should assist NETTLAP to establish and maintain linkages with relevant UN bodies and specialized agencies operating in the Region.

### **IV. Evaluation/Monitoring**

- 4.1 NETTLAP should ensure that these recommendations are reviewed and evaluated in subsequent workshops.



## **B. Environmental Economics**

### **1. Role and Activities of NETTLAP**

A major and desirable focus of NETTLAP should be facilitating the development and upgrading of both specific and general programmes in environmental education at the tertiary level.

NETTLAP, through its coordinators and members, should work to establish close relationships with industry in order to identify issues and assist with the application of environmental economics in the private sector.

NETTLAP should endeavour to have industry and governments co-sponsor many of its activities, in conjunction with UNEP and other international and regional agencies.

NETTLAP should encourage student participation in graduate programmes in environmental economics by preparing and disseminating appropriate materials (e.g brochures) which alert students to career opportunities in environmental management and policy analysis.

### **2. Role and Activities of NETTLAP Members**

Members are urged to disseminate relevant information (education and training experiences and suggestions, meeting announcements, details of training activities, publications etc) through *NETTLAP NEWS*.

Members should, with the assistance of NETTLAP and other organizations, encourage and assist universities and other tertiary institutions to offer introductory and advanced programmes in environmental economics.

### **3. Future Workshops**

When preparing curriculum guidelines, instructional materials and presentation aids there needs to be a clear identification of the target tertiary-level audiences - teaching staff or students; specialists in environmental economics or those with multidisciplinary interests.

Where appropriate, NETTLAP should also convene in-country workshops, focusing on the specific needs of the country; wherever possible, the present practice of using NETTLAP members as workshop resource persons should continue.

#### 4. Other Future Activities

NETTLAP should take the necessary action to expand and improve upon the outputs of the current workshop. One suggestion is the preparation of a textbook targeted on the experiences and needs of the Asia-Pacific region. This would support the teaching of environmental economics at tertiary institutions in the region. The framework for the proposed text should take into account the following: distinctiveness of the region, the need for case studies and other materials with an emphasis on the Asia-Pacific region, a balanced and comprehensive coverage, a focused rather than diffuse approach and a multidisciplinary perspective.

There is a serious lack of relevant instructional materials for use in teaching and training activities in environmental economics in the Asia-Pacific region; UNEP, through NETTLAP, is encouraged to support individuals and groups in the development of such resource materials.

NETTLAP is encouraged to assist in the development and implementation of short-term exchange programmes between tertiary institutions and between tertiary institutions and the private and government sectors. These programmes would be for both students and staff who are committed to enhancing their understanding of, and expertise in, environmental economics.

NETTLAP should work to further develop the linkages between its thematic networks in order to encourage a more holistic approach to training in environmental economics, emphasizing linkages, and ultimately integration, of the economic and environmental sciences.

## C. Coastal Zone Management

### 1. PREPARATION OF MATERIALS

NETTLAP and related organizations and institutions such as UNEP OCA/PAC, UNEP IE/PAC, UNESCO COMAR and IOC should give priority to:

- i) assessing and documenting existing and relevant case studies for the region;
- ii) further developing existing and relevant case studies, including those from Korea, Thailand, China and Cha-am that were presented at the workshop;
- iii) adapting relevant materials for education and training programmes in coastal zone management (CZM) and disseminate in appropriate forms (e.g. slides, videos, overhead transparencies, shareware computer models and data sets for demonstrations) to relevant tertiary institutions in the region;
- iv) preparation of materials for use in short courses and other fora aimed at raising the consciousness of the following regarding integrated coastal zone management (ICZM);
  - policy and decision makers;
  - developers of, and investors in, infrastructure in the coastal zone; and
  - community leaders, including NGOs and media.
- ii) preparation of materials for use in short courses and other fora for providing developers and investors with practical materials and methods related to ICZM.
- iii) preparation of succinct promotional materials to make potential participants aware of the benefits of attending such courses.

### 2. INCORPORATION OF CZM TOPICS IN EXISTING TERTIARY COURSES

Tertiary institutions in the region should give priority to main-streaming CZM topics in existing courses, taking into account the following:

- many students are intimidated by the scientific and process orientation of instruction in CZM;

- many students do not appreciate the relevance to their future of aspects of CZM, such as understanding of the fundamental processes operating in coastal environments;
- many students have only have interest in some components of CZM, preferring to concentrate solely on economic and policy issues, for example;
- incorporating CZM topics in existing courses is often a necessary first stage in the development of fully comprehensive and distinct programmes; and
- the CZM issues and response options which are distinctive to the Asia-Pacific region.

The incorporation process would be facilitated by NETTLAP, in conjunction with relevant organizations and institutions such as UNEP OCT/PAC and UNEP IE/PAC, by:

- preparing curriculum guidelines and instructional materials to support such developments;
- giving special attention to the development of materials for the lower levels of tertiary education and training, including colleges of education and vocational training institutes; and
- especially for the smaller and/or least developed countries, facilitating the use of innovative technology to develop materials which can then be provided to students using more conventional methods (e.g. staff have access to information via electronic mail and bulletin boards, but the materials are distributed to the students as printed copy).

### 3. INSTITUTIONAL CAPACITY BUILDING

Workshop participants are urged to establish an interdisciplinary team to initiate and support education and training activities in ICZM in their institution, by involving economists, sociologists, lawyers and public administrators as well as natural scientists and by extending invitations to CZM practitioners from government and the private sector to participate in the team.

### 4. SHORT COURSES IN ICZM OFFERED BY TERTIARY INSTITUTIONS

Through the preparation and distribution of curriculum guidelines, instructional materials and learning aids by NETTLAP and other relevant organizations and institutions such as UNEP OCT/PAC and UNEP IE/PAC, appropriate tertiary institutions in the region should be encouraged and assisted to offer short courses in

ICZM, with the objective of either i) raising awareness or ii) providing specific training.

The courses which need supporting and implementing are:

- a) short courses in specialized topics, focussing on ICZM issues, response options and implementation of prevention, mitigation and remediation strategies appropriate to regional and local conditions;
- b) short courses targeting senior policy and decision makers in both government and the private sector. In these courses attention should be given to:
  - recognizing the urgency for understanding by decision-makers of the nature and dynamics of coastal processes and of the linkage of those processes to socio-economic impacts;
  - keeping technical content to a minimum;
  - providing regionally and locally appropriate details on management options and the information and assumptions on which these are based;
  - the need to focus on the economic implications (e.g the economic costs of inappropriate management and the economic benefits of appropriate management); and
  - the linkages between sectors;
- c) short courses for developers and investors; and
- d) short courses for the public, with a focus on raising community awareness regarding ICZM issues, response options and implementation of prevention, mitigation and remediation strategies.

## 5. INTERDISCIPLINARY TRAINING IN ICZM AT TERTIARY LEVEL

The workshop participants noted, with great concern, the continuation of discipline-based education and training in CZM and the improbability of achieving sustainable development in coastal areas unless tertiary institutions better prepare their staff and their graduates to appreciate and work in interdisciplinary settings.

For these reasons, regional and international organizations, national governments and tertiary institutions are urged to give high priority to introducing and supporting truly integrated coastal zone management courses.

Through the preparation and distribution of curriculum guidelines, instructional materials and learning aids by NETTLAP and relevant organizations and institutions such as UNEP OCA/PAC, UNEP IE/PAC, UNESCO COMAR and IOC, appropriate tertiary institutions in the region should be encouraged and assisted to offer interdisciplinary courses in integrated coastal zone management, noting that:

- such courses are more appropriate at the postgraduate level;
- instructors in the training programmes should include practitioners from government and the private sector as well as academics;
- there should be a balance between the scientific and non-scientific information and methods relevant to coastal zone management;
- tuition should be process oriented rather than prescriptive; and
- content should be regionally and locally relevant.

## 6. INFORMATION ACCESS

Recognizing the wide range of available, but not readily accessible materials produced by related programmes, government agencies and workshop and other fora, NETTLAP should be assisted by relevant agencies to establish and maintain an on-line e-mail electronic bulletin board, a directory and shareware programmes and data for ICZM training.

This information should cover existing training curricula, class notes, literature lists, reports, computer assisted learning packages, video, relevant demonstration data sets and other relevant materials.

## 7. DISTANCE AND SELF LEARNING PACKAGES

Recognizing the importance of equity issues related to access to training programmes and acknowledging the demonstrated value of distance and self learning techniques and materials, particularly for:

- students and managers unable to attend long courses, and
- addressing the diversity and extent of background preparation of participants so that more effective use can be made of the limited formal training time that is available;

it is recommended that NETTLAP promote and support the development of distance and self learning packages for training in ICZM, noting that:

- a preferred strategy for initiating such activities would be to identify a small number of priority topics and establish working groups with the task of preparing prototype materials for evaluation and subsequent widespread distribution.

#### 8. INTERACTIVE SIMULATION GAMES

Recognizing the importance of computer modelling and role play in developing understanding and solutions for complex problems, it is recommended that NETTLAP, with the support of relevant organizations and institutions such as UNEP OCA/PAC, UNEP IE/PAC, UNESCO COMAR and IOC, convene a small specialist working group to develop the flow chart for a computer-based, interactive simulation game providing entertainment, but also insight into the processes of coastal land stability and erosion and benefits, costs and risks associated with coastal property investment and development.

NETTLAP should subsequently arrange for staff and students in a relevant tertiary institution in the region to develop an appealing and educational interactive game based on the flow chart.

#### 9. COORDINATION WITH RELATED ACTIVITIES

Recognizing that there is substantial common ground in the objectives of NETTLAP, EAS 19 and the TROMES programmes, it is recommended that:

- a) NETTLAP be represented on the group finalizing the EAS 19 training materials for Marine Protected Area establishment and management; and
- b) NETTLAP focus effort and draw upon the TROMES experience to develop further modules to address broader aspects of integrated coastal zone management for sustainable development.

#### 10. THE CHA-AM/HUA HIN CASE STUDY

Noting that there is:

- still the opportunity to promote appropriate development for the area;
- considerable local interest in, and support for, appropriate development in the area;
- interest and support from relevant organizations and institutions such as UNEP IE/PAC;

- representation in the area of most of the key issues related to the sustainable development of coastal tourism;
- an ability to compare/contrast environmental, social and economic conditions with other areas;
- an advantage to the invoking of a single comprehensive, coordinated approach thereby allowing inter-actions between sectors to be documented and better understood;
- issues and potential solutions which are of relevance to most countries in Asia/Pacific;
- relevant instructional examples for most courses in tertiary institutions in the region; and
- high and important human and environmental values at stake;

it is recommended that the Cha-am/Hua Hin area be developed as a case study in collaboration with the UNEP IE/PAC Sustainable Coastal Tourism Development Project by:

- a. preparing relevant case study packages, based on the most appropriate, and typically already documented, examples from the region;
- b. NETTLAP and UNEP IE/PAC facilitating the incorporation of these case studies into teaching and training programmes at tertiary level;
- c. using the case studies to reinforce the points to be made on sustainable coastal tourism development at the regional and national workshops to be convened in Cha-am by IE/PAC;
- d. using the case studies to guide the development of the methodology and aspects of follow-up case studies for the Cha-am/Hua Hin area; and
- e. preparing case studies for Cha-am, with selection of the case studies being guided by the issues and by the needs for understanding that are identified at the IE/PAC workshops in Cha-am - preferably one case study will be on measures to achieve sound and sustainable development prior to implementation of any formal management programme, including legislation.



11. PREPARATION OF INTEGRATED MATERIALS FOR TRAINING IN CZM

NETTLAP's Thematic Network for Coastal Zone Management should convene a working group to undertake a feasibility and implementation study related to editing a text which describes the evolution, processes and dynamics of the major coastal landforms and ecosystems in the region (e.g. mangrove systems, dune systems, tidal flats/chenier/beach ridge systems, coral reef systems and rocky coasts);

This, or an additional text should review: a) methods for CZM planning, including i) geomorphic/geological techniques to determine planning constraints and response strategies such as set-back limits; ii) biological/ecological techniques which are also relevant to the determination of planning constraints; iii) land resource/marine resource assessment techniques; and iv) resource capability assessment techniques; and b) legal/legislative frameworks.