REGIONAL TRAINING WORKSHOP

EDUCATION FOR SUSTAINABILITY

BANGKOK, 17-21 November 1997

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REPORT ON A REGIONAL TRAINING WORKSHOP

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Chapter 1

Introduction

Rationale and Background

The Regional Workshop "Education for Sustainability" was organized by the Institute for the Promotion of Teaching Science and Technology (IPST), Bangkok, in cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO) Principal Regional Office for Asia and the Pacific, (PROAP) Bangkok, and the United Nations Environment Programme (UNEP) Regional Office, Bangkok, from 17 to 21 November 1997. The workshop was a follow-up of earlier activities and consultations within the framework of UNESCO's Transdisciplinary Project "Environment and Population Education and Information for Development (EPD)," approved by UNESCO's General Conference in 1993 and officially launched in 1994. A new project entitled "Education for Sustainability: An Agenda for Action" was adopted.

Education for Sustainability is geared as a follow-up to the recommendations adopted by the following World Conferences: the United Nations Conference on Environment and Development (UNCED, Rio de Janeiro, 1992), the International Congress on Population Education and Development (ICPED - Istanbul, 1993), the International Conference on Population and Development (ICPD, Cairo, 1994), the World Summit on Social Development (WSSD, Copenhagen, 1995), the Fourth World Conference on Women (Beijing, 1995), and the United Nations Conference on Human Settlement (Habitat II, Istanbul, 1996). The project concerns are on education, information and public awareness, and focuses on six themes. These are: lifelong learning, interdisciplinary approaches, systems thinking, partnerships, multicultural perspectives, and empowerment, and deals with interwoven issues of environment, population and information for sustainable human development.

Since 1994, various stakeholders have been confronted with a difficult challenge — re-orienting education for sustainability, a task that must be accomplished in a short time with little resources. Several consultations and pilot projects were organized by UNESCO - PROAP for Asia and the Pacific Region, at both national and regional levels. In 1995 a Consultation Meeting was held in Beijing, organized by the National Commission of the People's Republic of China for UNESCO, and with funding support from the Korean National Commission for UNESCO. The meeting was attended by participants from the People's Republic of China, Democratic People's Republic of Korea, India, Mongolia, the Philippines, the Regional Collective Consultation of Youth NGOs for Asia and the Pacific, the Republic of Korea, Samsung Global Environment Research Centre, SEAMEO Regional Centre for Graduate Study and Research in Agriculture (SEARCA) and the Asian Region Network on Environment Education (ARNEE), SEAMEO Regional Tropical Medicine and Public Health Network (TROMMED), Sri Lanka, Thailand and UN Agencies namely UNEP, United Nations Population Fund (UNFPA), Food and Agriculture Organization of the United Nations (FAO), United Nations Children's Fund (UNICEF), UNESCO-PROAP, UNESCO Beijing and UNESCO New Delhi. The consultation identified the needs, adopted a framework and proposed strategies for action.
One strategy proposed with regard to education is the development of research-based prototype teaching-learning materials which illustrate EPD integration and focus on emerging concerns. It was agreed that in order to move forward faster, the experiences acquired, and the investments already made internationally, regionally, nationally, and locally will have to be maximized. The lessons learnt will be most useful in providing the foundation of work, especially in the development of integrated teaching-learning materials that show the interrelationship of the environment, population and development.

For this training workshop, participants were requested to have with them copies of the materials which they or their institutions had prepared in environment education, population education, science, social studies, and other subjects at the basic education level. The workshop participants reviewed and carefully analyzed the existing materials, looking into the gaps between vision and reality, and finally modified the materials to reflect the approach being adopted based on emerging concerns. What was taken into account is the integrated and co-ordinated approach to teaching and learning, with emphasis on raising awareness, acquisition of knowledge, skills and positive attitudes in an inter-disciplinary way, utilizing the anticipatory-participatory approach, and with action orientation. Recommendations for future follow-up actions were also formulated to enable faster re-orientation of education for sustainability, highlighting on the lessons learnt from the training workshop.

Objectives of the Workshop

The general objective of the workshop was to re-orient teaching-learning materials geared towards “education for sustainability.”

As stated, the workshop would specifically:

1. identify, collect and review existing materials;
2. prepare guidelines on re-orientation of the materials;
3. analyse the materials based on the guidelines, identify the gaps and effect actual revision or re-orientation;
4. formulate recommendations for future actions, including plans for try-out.

Expected Outcomes of the Workshop

The expected principal outcomes of the workshop were the re-oriented exemplar teaching-learning materials. There were however, additional expected outcomes, results of the preparatory work carried out by the participants as follows:

- Overview of projects and programmes linking environment, population and development: trends and issues;
- Deliberations on the EPD framework, and guidelines for re-orienting the teaching-learning materials;
- Plans for follow-up at regional, national and individual levels;
- Report on the study visit to the UNESCO-IPST Environment Management Education Centre.
The objectives and expected outcomes are reflected in the Agenda and Provisional Schedule of Work, as shown in Annex 1.

Participation

The regional training workshop was attended by twenty-four (24) participants, observers and resource persons. Countries represented were, Bangladesh, Brunei Darussalam, People’s Republic of China, Indonesia, Lao PDR, the Philippines, and Thailand. There were representatives from SEAMEO-RECSAM, UNEP Regional Office, UNFPA Country Support Team (CST) and UNESCO-PROAP. The resource support to the workshop was provided by Dr. Pisarn Soydhurum, and Ms. Laddawan Kanhasuwan of IPST, Bangkok, Thailand; Dr. Ruben Umaly, Suranaree University of Technology, Thailand; and Dr. J.P. Gupta, Indian Adult Education Association, New Delhi, India. Five members of the academic staff of IPST participated as observers. (the list of participants, resource persons and observers is presented in Annex 2).

Participation to the workshop was assured to be inter-disciplinary and multi-sectoral. The participants came with varied expertise and experiences, as scientist, environmentalist, science educator, science teacher, social studies teacher, curriculum developer, school supervisor, population educator, population information expert, and health educator. Their affiliations are with national institutions, IGOs, NGOs, regional and international agencies.

Process of the Workshop

Opening Ceremony

Welcome remarks were made by Dr. Thongchai Chewprecha, Director of the Institute for the Promotion of Teaching Science and Technology (IPST), Bangkok, and Mrs. Lucille Gregorio, Specialist in Science and Technology Education cum focal person for the Environment, Population and Development (EPD) Project, UNESCO-PROAP, Bangkok. The keynote speech was to be delivered by Dr. Suvit Yodmani, Regional Director, UNEP, who was represented by Mr. Mahesh Pradhan, Environmental Affairs Officer, UNEP Regional Office for Asia and the Pacific, Bangkok. The introduction of participants, special invitees and resource persons was made by Ms. Nantiya Boonklurb, Assistant Director, IPST and Chair, Organizing Committee of the Workshop. The closing remarks were made by Dr. Pisarn Soydhurum, Deputy Director, IPST. The statements made at the opening session are in Annex 3.

Organization of the Workshop

The objectives and outcomes of the workshop were presented by Mrs. L.C. Gregorio. She explained that the workshop was meant to be participant-oriented, and everyone was expected to contribute as facilitator, rapporteur or group member. The training workshop was conducted with plenary and group sessions. Each session had a facilitator from amongst the participants and resource persons. During the deliberations issues/concerns were identified and prioritized. The concerns selected were on Quality of Water and Disposal of Waste Products. Based on the two concerns chosen, two working groups were formed. Each group discussed and worked separately on the issues they
were to tackle. The re-oriented teaching-learning materials were later presented in plenary for comments and suggestions. Recommendations were proposed and adopted as the basis for follow-up actions, including try-out to be conducted by the participants in their own local situations.

The Study Visit

A field visit was organized to a UNESCO-IPST supported project, the “Environment Management Education Centre at the School Level”, at the Bang Tabun Witthaya School, Phetchaburi Province. The Centre was set up and coordinated by the Environment Education Centre, Rajabhat Institute Phranakhon, under the leadership of Ms. Laddawan Kanhasuwan, then Director. During the visit, the participants, observers and resource persons were provided with observation sheets to record the transformation in the context of the development of (i) part of the mangrove area; (ii) the city centre; and (iii) the people’s market. A sample observation sheet is shown in Chapter 6 of this report.

The Closing Ceremony

The session provided an opportunity for the participants, observers, resource persons and organizers to express their impression of the training workshop. Remarks were also delivered on behalf of UNEP and UNESCO. Certificates of Participation were presented to the participants, observers and resource persons by Dr. Thongchai Chewprecha, IPST Director, assisted by Dr. Wimala Ponniah, Senior Environmental Education Officer of UNEP, and Mrs. Lucille C. Gregorio, Focal Person for EPD, UNESCO-PROAP. The workshop was officially closed by the Director of IPST after delivering his closing remarks.

Acknowledgement

The workshop acknowledged, with profound appreciation and gratitude:

- technical and academic contribution of the resource persons;
- the paper on the EPD framework contributed by Dr. Merle C. Tan, Specialist in Environmental Science, Institute for Science and Mathematics Education Development, University of the Philippines (UP-ISMED);
- the support of the Director and staff of IPST, for their untiring hospitality and care extended especially to the foreign participants and resource persons;
- the assistance provided by the Director and staff of the Environment Management Education Centre, Bang Tabun Witthaya School, Phetchaburi Province;
- technical and financial support provided by the UN agencies, UNESCO, UNEP and UNFPA;
- to all those who had worked in the background to ensure the success of the workshop.
Chapter 2

An Overview of Projects and Programmes Linking Environment, Population and Development (EPD): Trends and Issues

The participants of the workshop were required to undertake preparatory work; a paper entitled “A National Overview of Environmental and Population Education and Development Programme” was to be prepared by each of them, and the brief of the papers to be presented to the workshop. The international and regional agencies were also requested to present an overview of their activities/programme relating to EPD. Summary of the reports are presented in this Chapter.

Reports of International/ Regional Agencies, and National Institutions

UNEP

UNEP’s role is to catalyze, coordinate and stimulate environmental action within the UN Systems. The organization has developed a Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP). It organizes resource development workshops and utilizes the expertise of experienced educators and trainers to develop:

- Curriculum objectives and guidelines; and in support of these,
- Resource materials;
- Instructional aids;
- Self-learning materials/packages.

The products are distributed to institutional and individual members of the thematic network. The organization supports both the formal and non-formal education sectors for training in environmental education. At present the programmes are being initiated or are being implemented in the Philippines and Lao PDR, funded by the German Agency for Technical Co-operation (GTZ); the People’s Republic of China with financial support from the Norwegian Agency for Development (NORAD); India funded by UNDP; Vietnam supported by the Danish International Development Agency (DANIDA); and Malaysia and Thailand with support from the Danish Co-operation for Environment and Development (DANCED).

To implement Agenda 21 Chapter 36.5(1) of the Rio Declaration, the organization supports the strengthening of environmental and development education and accordingly existing regional networks and activities and national university actions. The aim is to promote research and common teaching approaches on sustainable development. These are built upon new partnership and bridges created with the business and other independent sectors in the Member Countries.
UNFPA

The integration of environment and sustainable development issues and concerns into population education programmes both in the formal and non-formal education sectors is one of UNFPA’s responses to the major environment and development challenges facing the world, including the economic and social dimensions of sustainable development such as poverty, consumption, demographic dynamics, human health and human settlement. UNFPA is providing both financial and technical assistance in implementing population education programmes to around 20 countries in the region. These programmes are either introduced as a separate subject or integrated into social studies, science, biology, geography, home economics, civics, moral education, mathematics, health education, languages and other subjects as environmental studies, family life education, “The World Around Us”, community life, work experience, and the like. They are taken up in the primary, secondary or higher levels, while some countries include them in all of these educational levels. They are also introduced in teacher training programmes as well as in the non-formal education sector. Many of the curriculum and instructional materials reviewed sometimes fail to show direct linkages between environment, population and development. These materials either describe solely environmental processes and consequences or focus only on population/demographic processes and consequences without showing the implications on how they affect each other, thus the need to promote training on the integration of environment, population and development in the school subjects.

UNESCO-PROAP

UNESCO’s Transdisciplinary Project “Environment and Population Education and Information for Human Development (EPD)” follows the guidelines of “Education for Sustainability: An Agenda for Action”. The project has gained the support of Member States — governments, NGOS, industries, media, the private sector and people-at-large.

EPD, according to UNESCO’s Director General, Mr. Federico Mayor, answers one of UNESCO’s immediate priorities, “the need for an integrated approach to development, both environmentally sound and designed to release the creative potential of individuals.” The project owes its conception to the need of addressing the issues of environment, population and development in an integrated way, in order to achieve development that is people-centred, equitable and sustainable.

The main aim of EPD is the re-orientation of education, the educational enhancement of public information and awareness and training as an indispensable means for achieving sustainable human development. Such re-orientation seeks for integration of disciplines, expertise, strategies, and modalities in reaching for the holistic outcome: sustainable human development for quality of life. EPD also seeks to foster the united thrust of multi-lateral assistance by strengthening co-operation with institutional partners of the United Nations system. New partnerships have been forged with existing networks of governments and NGOs associated with UNESCO.

Two key mechanisms of the project are the UNESCO-UNEP International Environment Education Programme (IEEP), and the UNFPA-UNESCO action scheme.
on Population, Information, Education and Communication (IEC). EPD is based on three main principles, namely:

- Refinement of the knowledge-base and development of action frameworks
- Development of new or re-oriented education training and information programmes and materials and strengthening of Member States’ capacities
- Mobilization of support of decision-makers and opinion leaders at international, regional and national levels in favour of project actions.

PROAP organized various activities to implement the project. In May and July 1994, two inter-agency consultation meetings were organized with the "Framework for Integration" as its major output. The framework was validated by selected institutions in the Member States. In 1995, pilot studies and projects were organized, the results of which are as described in the Beijing report. These were as follows:

1. Project HELP (Health, Environment, Livelihood and Population) undertaken by the Institute for Science, Mathematics Education for Development, University of the Philippines (UPISMED);
2. Youth NGOs and Environment, organized by the Regional Collective Consultation of Youth NGOs in Asia and the Pacific (RCCAP);
3. HIV/AIDS Awareness Prevention and Control through Integrated EPD Related Materials, by the SEAMEO Regional Tropical Medicine and Public Health Network (TROPMED);
4. Urbanization and Development by the Environmental Education Centre, Rajabhat Institute Phranakhon, Bangkok;
5. Rural Women and EPD for Quality of Life, by the Centre for Women Research (CENWOR), Sri Lanka;
7. Environment and Population Focusing on Biodiversity Conservation and Sustainable Development organized by the SEAMEO Regional Centre for Graduate Study and Research in Agriculture (SEARCA) and the Asian Region Network in Environment Education (ARNEE);

After the Beijing Workshop, two workshops were organized, one hosted by the SEAMEO Regional Centre for Educational Innovation and Technology (INNOTECH), on “Alternative Strategies for Assessing Science, Technology and Environment Literacy for Girls and Women.” The other workshop decentralized from Headquarters was organized in PROAP, the Asia Regional Study Director’s Meeting on “Socio-Cultural Factors Affecting Demographic Behaviour and Implications for the Formulation and Execution of Population Policies and Programmes”. This present workshop is one major activity implementing one of the recommendations put forward in Beijing, and following the three objectives of EPD.
SEAMEO-RECSAM

The RECSAM mission is to fulfil the SEAMEO Member Countries’ expectations in the area of science and mathematics education and to serve various institutions to meet their needs. The Centre is now moving towards the optimization of its facilities and services to serve broader education areas, one of these is environmental education. The challenges directed toward the better implementation of RECSAM’s programmes originate from several resources namely: the Member Countries; local organizations in Malaysia; internal projections and future planning of activities by the Centre staff; and current trends emerging in the world community. The Centre is also confronted with the expectation that it should conduct training programmes to address societal needs. A course entitled “An early start to SETS (Science, Environment Technology and Society) Education” has been introduced to address the needs of the community. The course was designed for the teaching-learning of science at the primary level. However, similar science and non-science training courses relevant to different levels of learner are being designed and developed. These new courses aim to meet the needs of learners of various ages and educational backgrounds of the Member States.

IPST

The Institute for the Promotion of Teaching Science and Technology (IPST), established in 1972, is under the supervision of the Ministry of Education, Thailand. The Institute is responsible for the development of science, mathematics and technology curriculum; preparation of supplementary teaching-learning materials and teaching aids including audio-visual, low-cost equipment and computer lessons from primary to secondary levels.

The curriculum materials produced by IPST are designed for primary (grades 1-6), lower secondary (7-9), and upper secondary levels (10-12), following the pronouncements of the Ministry of Education. For the primary level, the subjects are entitled “Life Experiences”; for lower secondary level, general science courses are offered. At upper secondary level, studies are separated into chemistry, physics and biology offered for the science stream students. The non-science stream students will take up physical and biological science modules. Environmental education and population education are integrated in these subjects as part of compulsory education, which currently is six years of basic schooling, though a free basic education of 12 years is stipulated in the new 1997 Constitution.

The vocational stream students have their own science curriculum with the inclusion of environmental concepts as part of their general education. Technology concerns are also met through technological courses including computer education.

IPST also organizes several teacher-training workshops to train in-service teachers on how to implement the curriculum. Supervisors and school administrators are invited to these workshops to familiarize them with the new programmes.
Bangladesh is a small tropical country in South Asia, with a total population of 122.2 million (1993). The curricula of all programmes (for children, adolescents and adults) cover aspects relating to environment, population and human development. In the primary education programmes (both formal and non-formal), environmental issues are presented separately through a subject called environment studies, whereas in adult and adolescent’s literacy programmes environmental issues are integrated with the literacy texts. However, the information provided in the text or instructional materials on environment, population and development are not communicated effectively through the anticipatory-participatory process, and the objectives of bringing changes in behaviour, attitude and life situation, in many cases, remain unfulfilled. In non-formal education programmes and in certain cases of formal primary schools, where learner-centred classes are organized, the learners ‘learn by doing’. The learners use their environment as their learning resource, thereby making them conscious about their own situation. They also play active roles in the management of family and societal issues.

Brunei Darussalam

The population of this small country with a land area of 5,765 square km. and a coastline of approximately 130 km. is 305,100. The State places a great importance on promoting healthy environment and sustainable development and management of its resources. A separate ‘Environment’ Unit has been established in the Ministry of Development which is tasked with the co-ordination of all the wide-ranging matters concerning the environment.

The Ministry of Education’s Curriculum Development Centre has included environmental and population education issues in the curriculum, formal and non-formal curriculum, as well as educational programmes for the public. Co-curricular activities for students in the form of competitions such as landscaping and beautifying school gardens are held to raise the level of awareness towards plants and trees, and biodiversity in general. Recently, the Ministry of Education developed a project called “Science, Technology and Environment Partnership” (STEP). The aim is to support educational programmes on science, technology and the environment.

China

The China Association for Science & Technology (CAST) plays a lead role in non-formal education for sustainable development. China is a developing country and while focusing on economic development, often the consequences of their activities to environment are ignored. A non-formal environment education programme for the youngsters of rural communities of poor counties has been developed. Children and youth between 12 and 18 years old, especially those who cannot continue their studies because of poverty, the majority of whom being girls and women, are the target of the programme. Under this programme, Non-Formal Education Centres are established in villages which provide the young girls and the women with training on the understanding of basic concepts on environment and sustainable development, literacy, hygiene, popular
science and also employment. Activities are usually organized after formal classes. The other main programme launched by CAST is “Clean Water for Life — 97 Science Dissemination Action by Children and Youth.”

In 1997, this programme focused on ecology, environment and sustainable development. The theme of the programme, Clean Water for Life means that education and communication activities of the programme are centred on water, water and life and water and sustainable development. Under this programme, a ‘Children’s Action Day’ was organized in different provinces across China. 620,000 children participated. The second activity for students held during the summer vacation, combined with cultural activities, include scientific surveys of water sources and local ecosystems. The theme of these summer camps was on Protection of Clean Water. The third important focus of the programme was on Clean Water for Life of Three Rivers and Two Lakes. This programme was carried out with the co-operation of the World Wide Funds for Nature (WWF). China has an active programme in the area of ecology, environment and sustainable development. CAST, together with formal educational institutions and other partners have accepted the responsibility to initiate educational programmes for sustainable development.

India

Population and environment education in India has a long history and the first project in the school sector was launched with UNFPA assistance as early as 1980. In 1986 two more projects in adult education and higher education were taken up for implementation. The new cycle of the “Population and Development Education Projects” is to begin from 1998 to 2001. In this cycle, in addition to these three projects, one more project, entitled, “Population Education for Youth and Adolescents for Out-of-School” will be launched. Besides these projects, a scheme called, “Environmental Orientation to School Education” was initiated in 1988-1989 through voluntary agencies to conduct experimental and innovative programmes aimed at promoting integration of educational programmes in schools with local environmental conditions. Education Policy 1986 and Programme of Action (PoA) 1992 have laid down guidelines and provided due emphasis to integrate population and environmental issues in the educational system of the country.

The international conferences and their recommendations have had a profound impact on the thinking of population education concepts. As a result, the title of the projects have been changed to “Population and Development Education”. The emphasis is now on developing the understanding through education to create awareness and responsible behaviour towards population and sustainable development. The core messages identified earlier for teaching-learning resources have been greatly reconceptualised and emphasis is now placed on sustainable development. Co-ordination strategies between the three projects and allied sectors have been evolved. National level, state level, district level, block and village level co-ordination mechanisms have been evolved.

Training strategies and classroom instructions differ from one sector to another. In community-based programmes, classroom instructions are based on group discussions, observation methods and participatory methods that involve learners, use of pictures given in the primers and posters, sharing of experiences and use of audio-visual aids.
While in the school sector, in addition to classroom instructions, village adoption programme and population education laboratory programmes are considerably encouraged. Co-curricular activities have helped and a large number of students, teachers and members of the community have participated in these activities. Face-to-face, integrated and three-tier training systems are adopted in the school sector. The 'District Centre' approach is encouraged, and the ‘School Complex Training’ and the ‘Massive Teacher Training’ is an important part of the training initiatives. Such training materials as handbooks, films, slides, source books, audio-cassettes of folk songs have been produced. In the community-based programmes, the integrated strategy is being emphasized. A three-tier system of training is being implemented. Evaluation has so far not revealed a satisfactory picture of training implementation. The strategies for project implementation should focus on qualitative aspects of project activities and ensure effective networking among the population education projects in different sectors of education.

The major thrust areas in the school-sector population education project will be two-fold as given below.

1) Integration of elements of post-ICPD reconceptualised population education in the content and process of school education and teacher education; and the

2) Introduction of adolescent education in the work plan of the schools for the period 1998-2000 with focus on:
   i) Curriculum and material development;
   ii) Training;
   iii) Co-curricular activities;
   iv) Evaluation and research;
   v) Networking.

**Higher Education** (University students)

The major components of the work-plan for the period 1998-2001 will be as given below:

1) Strengthening of existing counselling initiatives (Helpline);
2) Integration of population education — B.Ed. and M.Ed. courses;
3) Strengthening of PERC’s and research activities;
4) Foundation courses at the undergraduate level;
5) Expansion of population education clubs;
6) Community level — youth to youth activities.

The training, materials, research, curricular activities and evaluation monitoring will be organized as per work plan.

**Adult Education** (Adult Literacy Campaign)

420 districts have already been approached for Total Literacy Campaigns (TLC), Post Literacy Campaigns (PLC) and Continuing Education (CE). 60% of the beneficiaries
are women. Since post literacy and continuing education will be a dominant strategy, it will serve as the nucleus for providing more intensive opportunities of imbibing the messages of the proposed Population and Development Education cycle given below:

1) Curriculum and materials development in the light of ICPD recommendations specially for Continuing Education Centres;
2) Extension of project activities to Polyvalent Adult Education Centres (SVP’s) meant for vocational/skill upgrade of workers;
3) Training and orientation programmes for project personnel and others;
4) Research, evaluation and monitoring.

Networking and partnership for effective implementation will be made at national, regional, state, district, block and village levels between the educational implementing agencies, NGOs, and media development departments. A co-ordination committee will be established in which representatives of the concerned agencies will participate every three months to strengthen the process of effective networking.

Indonesia

Environmental and population education has been developed in Indonesia since 1975. Efforts to improve the education have been made by the Ministry of Education and Culture. This includes the development of guide books for teachers. Rather than being a separate subject, environmental and population education has been incorporated into relevant subject matters. The aim is to reduce the workload faced by both teachers and students. Research conducted by the Teacher Training Institute (IKIP) Malang, has shown that the teaching process on environment and population has not been optimal in some cities in East Java. Therefore, a number of modules have been developed as a resource for teachers, for their effective implementation of the integrative approach.

The objective of environmental and population education in Indonesia is to provide students with knowledge, attitude, rational behaviour, and social responsibilities toward environmental and population issues. The population issues are:

1) Large number of population;
2) High rates of population growth;
3) Sparsely distributed population;
4) High percentage of younger population;
5) High rates of urbanization; and
6) Fairly low quality of population which does not significantly contribute to the development.

The environmental issues include:

1) Decrease in quality and quantity of natural resources;
2) Polluted physical environment;
3) Physical development that adversely affects socio-economic environment;
4) Non-physical development that negatively affects socio-culture and environment.

The graduate students at IKIP Bandung, specializing in elementary education, have studied the national curriculum (1994). They introduced lesson plans on environment and population topics to elementary schools. Research on these topics is still being undertaken. In conducting teaching practice, teaching materials in the form of books have been provided to teachers. Issued by the Ministry of Education and Culture, these books consist of guidelines on environmental and population education. Supposedly, the books provide the teachers examples of the ‘integrative approach’ in teaching environmental and population subjects. In addition, the teachers are expected to incorporate topics related to current and essential issues on environment and population. Moreover, issues selected are supposed to motivate students in developing their personal character and meet their aptitudes, needs, and abilities.

**Lao People’s Democratic Republic**

Lao PDR has been implementing an UNFPA-assisted project on population education for formal and non-formal education. Population education concepts are integrated as a separate unit in social studies and biology subjects from grades 6 to 11 and in “The World Around Us” in grades 4 and 5. The concepts and messages are also being integrated into basic literacy skill development programmes — family life education and activities of non-formal education programmes. The integration of population and environmental issues in various subjects ranges from 4 to 20 topics. At teacher-training level, there are as many as 20 topics. The topics included in the school sector which relate to the environment are: — population and environment, problems of natural resources degradation, quality of life, population change and its consequences, population and natural resources development, and women and development. Non-formal education topics include the use of forest, waste disposal, environment, the relationship between resources and quality of life, environmental cleanliness, population, environment and development, and family life quality. Efforts in the right direction are being made. Lao PDR is going to launch another programme with UNFPA assistance for 1998-2000 and there could be better linkage between population, environment and development in this new programme.

**The Philippines**

The Population Education Programme (PEP) in the Philippines which was officially launched in 1972, supports the Population Commission’s efforts to reduce the rapidly growing population of the country. The Population Commission (PopCom) was mandated in 1970 to serve as the central co-ordinating body of the government in the field of population. One strong basis of Population Education now being offered in the school curriculum is the Philippine Constitution which expresses government commitment to deal with the problem of rapid population growth. In teaching population concepts, certain policies and guidelines being observed include respect for the sacredness of human life, the reaffirmation of the family as the basic unit of society and as the foundation of all efforts for development, the recognition of the role of women in nation building, the affirmation of freedom of conscience in accord with religion and moral conscience, and the holistic view in human development.
Meantime, the World Plan of Action, which is an output of the International Conference on Population and Development held in Cairo, Egypt, has set the tone for the goals and objectives of the Philippine Population Programme Plan for 1993 to 1998. The Philippine Programme Plan also draws impetus and strength from earlier conferences that revolutionized the view of the world and how to care for it and the view of humans and their empowerment. Filipino leaders remain convinced that there is a strong interconnection among the factors of population, economic deprivation, production and consumption patterns, and environment. Many major conferences on population called for programmes of action that pushed the human agenda in every community, national and international endeavour. These same gatherings also called for initiatives by participating nations like the Philippines to transform visions into realities, and concepts into deeds.

Population education concepts revolve around core messages such as: small family size and family welfare; delayed marriage; responsible parenthood and family planning; population and sustainable development; and status and role of women. These core messages have been found essential to substantial and meaningful modifications in programme implementation of population education in schools and communities within the framework of sustainable development. The use of innovative teaching strategies in population education classes are being used and these include: debates; oratorical contests; talks by dynamic resource speakers; use of charts and posters; committee work; problem-solving; field trips; TV broadcast programmes, slide presentations and round-table discussions with professional groups, value clarification techniques and anticipatory-participatory learning techniques.

The Government of the Philippines acknowledges that it is impossible to address the population issue without considering poverty and social development. Conversely, poverty and sustainable development cannot be tackled unless population growth is included in the development equation. In order to effectively contribute to the vision of Philippines 2000, all sectors are joining hands to exert a unified effort to effect meaningful changes in attaining levels of sustainable development for future generations, as reflected in the country's Social Reform Agenda.

Thailand

Thailand has a very rich natural resource. In the new 1997 Constitution of Thailand, environmental and population education is recognized as vital to life-long education. The country has been implementing its five-year National Economic and Social Development Plans since 1961. These plans have emphasized economic development with mention of conservation of natural resources. The 8th Plan, currently being implemented, is now putting emphasis on human development for quality of life.

IPST, as reported separately in this report, is tasked with the development of science, mathematics and technology curriculum of the country. Since 1995, it has developed the environmental science framework as a part of the science curriculum. The content of the curriculum includes — ecosystems, human population, natural resources, environment degradation. The content, concepts and activities of the environmental science were designed for students from elementary level to secondary level in
progression. At elementary level, the content, concepts and activities of the environmental science were integrated in general science topics which were combined in a subject cluster named “Life Experiences”. At lower secondary level, the environmental science was designed as an elective course. In 1997, the Ministry of Education made the environmental science course a compulsory subject for upper secondary level. The teaching/learning materials in the environmental education science course comprise student activities, suggested information sources, teacher’s guides, and such audio-visual aids as slides and video tapes. The teaching approach puts emphasis on co-operative learning inquiry, hands-on activities, fieldwork and practical projects.

Moreover, the Science Across Asia Pacific (SAAP) Project introduces a new approach to learning science and environmental issues by encouraging communication among school children in different Asia-Pacific countries. The SAAP was initiated by RECSAM with support from British Petroleum. Thailand, as a member of SEAMEO, is participating in the project which has provided rich experiences and new insights in environmental education through science learning. More than a hundred schools are participating in this project. The teaching units are integrated in regular science courses and student activities, and in science and environment clubs.

Non-governmental organizations also take active roles in environmental and population education in Thailand. Some of them are: Thailand Environment Institute; the Rung-Arun Project and the Science Teachers’ Association of Thailand. These organizations provide invaluable services to local communities.

Trends and Issues

The synthesis and discussion on Trends and Issues, based on the presentations, revealed the trends in the region as presented below:

1) Population stabilization, environmental protection and struggle against underdevelopment, especially the poverty of people, are important concerns of most of the countries.

2) The education sector, both formal and non-formal, as a national policy in most countries of the region, has started to play an important role in cultivating necessary knowledge, adequate skills, positive attitudes and appropriate action among learners of schools, universities and non-formal education centres in population, environment and development.

3) Actions and initiatives for re-orienting and improving the quality of education as a means to disseminate knowledge on aspects of sustainable human development have been initiated or are being initiated or proposed to be initiated.

4) UNFPA, UNEP, SEAMEO and others are playing key roles in re-orienting and improving the quality of education for disseminating necessary knowledge, skills, and attitudes to learners on integrated environment, population and development concerns by providing
technical and financial resource support to many countries in the region.

5) The analysis of the presentations reveal that environment, population and development issues are introduced in almost all grade levels in a spiral manner, from the simple to complex concepts, ranging from appreciation of plants through tree planting in schools and homes, water sanitation, to global warming, the use of technology and its impact on the quality of life, and the consumption of resources.

6) The contents of environment, population and development interrelationship are found in teacher’s and student’s guides, resource books, teacher-training manuals, textbooks and audio-visual materials.

7) Different countries have different focuses in their curriculum depending on the existing priority problems they face. For example, in Thailand and the Philippines, environmental pollution arising from cars’ exhaust, sewage problem and deforestation remain the major problem areas, while China and India are plagued with depletion of water resources.

8) Many of the curricular and instructional materials in the region sometimes fail to show direct linkages among environment, population and development. These materials either describe solely environmental processes and consequences or focus only on population/demographic processes and consequences without showing the implications on how they affect each other. It appears that there is a need to re-orient the approach being adopted.

9) In most of the countries, there is a need for the development of integrated teaching/learning materials showing the interrelationship of environment, population and development.

10) Though different countries have different focuses on issues, there are also commonalities among the issues, such as, urbanisation and development of megacities, water, forests, oceans, energy, agriculture and lands, quality of life and poverty, and so on.

11) The integrated EPD framework adopted for Asia and the Pacific shows that the approach could be adopted in re-orientating teaching-learning materials already existing in the Member Countries.
Chapter 3

The Framework of Environment, Population and Development (EPD)

In the 1992 Earth Summit, in Rio de Janeiro, the important underlying issue discussed was related to the question:

"Is the rapid increase in the number of people on our planet the main reason for the growing environmental stress, or is it due to the consumption patterns together with wrong policies?"

This question stems from the fact that developed countries are being blamed for today's consumption and emission patterns, whereas present (and future) population growth is concentrated in the developing or less developed nations.

The issue is still being debated on in many conferences and symposia. A number of analytical approaches to resolve this debate have been presented. Quantitative models have been introduced and one of the equations that gained prominence is that of Erhlick and Erhlick (1990). The equation is:

\[ I = PAT \]

where:
- \( I \) = Environmental Impact
- \( P \) = Population
- \( A \) = Affluence
- \( T \) = Technology

The equation \( I = PAT \) shows that environmental impact has three relevant components: population size, affluence and technology. It further shows that one environmental problem is not caused by a single factor but a combination of several and even interrelated phenomena.

Note however, that the term environmental impact may vary with the kind of problem at hand. For example, the factors relevant to deforestation may be different from those that cause ozone layer depletion or loss of biodiversity. It is also worth mentioning that although the factors affecting environmental impact may be independent, some interactions occur, e.g. high population increases demand for technology, population growth decreases affluence, and increasing affluence reduces population growth.
Some Approaches in Studying The Population-Environment Issue

- The Linear- Causal Model

Some groups view the population-environment issue in terms of a linear causal chain, as shown.

While the population variable can be defined as a distinct entity, (e.g. the number of people in a certain region), it is uncertain what to put in the environment box. As mentioned earlier, environmental problems vary in different places. Urban centres have totally different environmental problems from those in the rural areas. The same problem may be experienced in different places but in different intensities. Moreover, human population is part of nature and is dependent on the environment for its life support system. Therefore, the laws that govern the environment are the same as those that affect human population. This model does not reflect these ideas.

- The Concentric Model

This model includes the effect of development in the population-environment issue. It further shows that development (i.e. the sum of the sociological, economic, and cultural activities) is intermediate between the aspects of human population and the natural environment.

- The concentric model shows that life on Earth is affected by activities related to the pursuit of economic development and that environmental processes affect development. However, this model does not reflect the interconnectedness among the environmental systems and the factors that affect environmental quality.
The EPD Framework

The goal of education is “quality of life” for everyone. But quality of life is greatly influenced by the quality of the environment. This means we have to use the environment and its resources in a sustainable manner in order to sustain life. The EPD framework, therefore, should show how population, development and environment relate and interact to one another, to achieve the quality of life goal.

A framework that reflects the interactions of the environment-population-development is presented in Figure 1 below:

![Figure 1: The EPD Framework](image)

The framework was adapted in the Beijing Consultation in 1993; it recognizes the idea that education for sustainability depends on the knowledge, skills, and attitudes people have towards the resources on Earth and on how the Earth functions. The framework also shows that the environment-population-development interactions are complex and require a sound scientific and technological base. It is made more complex because of political, socio-cultural and even historical influences. Educators now equate quality of life to development of higher-order thinking skills. This simply means that people need to develop skills in creative and critical thinking so that they can cope with the fast changes in society and the environment. They have to be taught skills in investigation and communication to be able to become good problem-solvers and decision-makers.

In the above context, different aspects of the EPD framework were considered and issues involving the following areas were also discussed for simplification:

1. What is environment?
   Difference between the home, community, social and natural environments.
2. What are resources?
- Classification
- Air
- Water
- Forests
- Soil
- Mineral resources
- Food resources
- Energy resources
- Human resources.

3. Balance of nature
- Ecosystems
- Flow of energy
- Upsetting the balance.

4. Harmful effects of population growth on the environment
- Over-exploitation
- Ecological disturbance
- Pollution
- Congestion, human, social and others.

5. Managing our environment
- Resource conservation and education for sustainability.

After a thorough discussion, a consensus was reached and the EPD framework was accepted as one answer to illustrate the interdisciplinarity of environment, population and development. The identified emerging issues/concerns in the regions are as follows:

1. Quality of Water;
2. Disposal of Waste Products;
3. Development of Megacities;
4. Rapid Population Growth;
5. Depletion of Resources:
   - Energy,
   - Plants and Animals — Biodiversity,
   - Minerals.

From the above list, the following two issues or concerns, namely, Quality of Water and Disposal of Waste Products were selected as priority concerns, and two groups were formed. Each group selected one topic, and took on the task of preparing a re-orientation of exemplar teaching-learning materials.
Chapter 4

Suggested Guidelines and Exemplar Teaching-Learning Materials

4.1 Suggested Guidelines on Re-orientating Teaching-Learning Materials

*Suggested Criteria*

The primary criteria suggested in re-orientating the teaching-learning materials on environment, population and development are as follows:

1. The material has to promote *awareness* of environment, population and development concerns;
2. The concepts are *interdisciplinary*;
3. The objectives have to include acquisition of knowledge, skills and positive attitudes to encourage *behavioural change*;
4. The teaching strategy should be *participatory and anticipatory*;
5. The activities are geared towards *taking action* (action-oriented).

*Contents of the Teaching-Learning Package*

The following may be included in the teaching-learning package:

1. A user’s guide;
2. Objectives of the teaching-learning materials;
3. Description of resources included;
4. Methodology suggested in the use of the teaching-learning materials;
5. Selection and use of learning materials among different categories of learners;
6. Methods of judging the effectiveness of the learning materials.

The user has to be made aware that the teaching-learning materials included in the package are by no means exhaustive. The development of the materials should be looked at as a continuous process and users of the package are free to add, remove, or expand any of the materials depending on the needs of the learner community. It is suggested that the learners themselves should also get involved in the repackaging/re-orientation process in order to enrich their learning.

*Suggested Outline*

The following outline is suggested to guide the re-orientation of the teaching-learning materials:

1. Title of material;
2. Purpose of the material;
3. Message being put forward;
4. Target audience;
5. Methodology or teaching-learning strategies;
6. Sample teaching-learning activities;
7. Evaluation or assessment required;
8. Follow-up action by the learner.

Tasks in the Re-orientation of the Teaching-Learning Materials

The following tasks in the re-orientation of the teaching-learning materials are suggested:
1. Identification of objectives, theme and users of the materials;
2. Selection of concerns and re-orientation of materials;
3. Selection of activities;
4. Use of evaluation or self-addressed questionnaire to obtain feedback.

In order to facilitate the preparation of the teaching-learning materials, a demonstration of the preparatory process of sample lessons could be arranged, following the steps as shown:
1. Identification of problems and concerns in the area;
2. Identification of core messages;
3. Development of concept maps from identified core messages;
4. Identification of strategies for integration of concepts;

To work on the above, the following procedure is suggested:
1. Review existing materials;
2. Match with the Suggested guidelines;
3. Identifying gaps/emphasis of the learning content/messages;
4. Re-orientation or re-packaging of the teaching-learning materials or the lessons.

With the above guidelines presented, two groups worked simultaneously in preparing exemplar teaching-learning materials on two emerging concerns. Exemplar 1: Quality of Water, and Exemplar 2: Disposal of Waste Products. The groups focused on previously identified core messages, teaching-learning strategies and student and teacher activities. Their task was to re-orient teaching-learning materials out of the existing materials with goals of interdisciplinarity of environment, population and development concerns. The teaching-learning materials that were prepared were premised on the principle of interconnectedness and the understanding of the interrelationship of the ecological system and human activities, in order to prevent the disruption of the environment and suffering of present and future generations. The materials will be tried out in micro-scale in the participating countries.
4.2 Exemplar 1: Quality of Water

Introduction

This package of teaching-learning materials covers various aspects of water, with specific emphasis on the quality of water. This is intended for use by children of the 12-15 age group, who have completed primary education. Although this package has been developed as a set of self-instructional materials, it is necessary to seek support from the teachers of other subjects in undertaking the suggested learning activities in order to ensure interdisciplinarity.

General Objectives

The learner, after going through the lessons should be able to:

1. be aware of the usefulness of water in human daily life, and in other community activities;
2. discuss the various activities taking place in the bodies of water e.g. streams and rivers;
3. explain why the water from some sources is not safe for human drinking and other human activities;
4. perform some experiments to find out what organisms are found in those bodies of water;
5. discuss how water is used by the industries (if any) found in the community;
6. consult experts from the community to obtain their views on how to manage the water source properly;
7. explain the nature, quality and distribution system of water from the source until it reaches the households; and
8. organize projects for people to take action related to conserving and preserving water in the community.

Issues

Environment

1. Water is the most abundant compound and very important in the daily life of living organisms especially humans, therefore, it should be used wisely.
2. Water has a tremendous effect on climate and on how the earth's surface is shaped.
3. Water can be polluted if not managed efficiently, especially discharges from households, community infrastructures and effluents from industries.
**Population**

1. Due to rapid population growth, water demand is expected to double in more than half of the countries of the world by the year 2000.
2. In many arid and semi-arid areas, population growth has raised food demand to a level that can only be met if sufficient water is available.
3. Population growth creates water shortage not only by adding to the numbers of consumers but also by increasing population density beyond the level that nearby water supplies can serve.
4. There is a concern over the dynamics of balancing an increasing population with the demand for water.
5. Water stress occurs when there are many people competing for water, resulting in an inherent water-deficit problem.

**Development**

1. All living things need water for survival.
2. Industries need water to function efficiently, for manufacturing, transportation, generation of electrical power, etc.
3. Many recreational activities of people revolve around water.
4. Decreased amount of water can cause reduction in crop production.
5. Development projects demand more water resulting in water deficit, and also in poor water quality.

**Suggested Materials for Inclusion in the Package**

This package contains the following teaching-learning resources on water:

*For concept development*

1) Sources of water;
2) Types of water; characteristics of pure water;
3) The water cycle;
4) Natural distribution of water;
5) Uses and functions of water;
6) Effects of human activities on water;
7) People's lifestyle and consumption or use of water;
8) Different ways to manage water;
9) Community water storage;
10) Local beliefs regarding water use;
11) Causes of surface water pollution;
12) Contamination of underground water;
13) Consequences of using polluted water;
Suggested Teaching-Learning Aids

1) Worksheets;
2) Questionnaires;
3) Reading materials;
4) Graphs and charts;
5) Case studies;
6) Reference materials;
7) Guide sheets;
8) Games;
9) Audio-visual aids.

Suggested Teaching-Learning Strategies

1) Brainstorming and group discussion;
2) Role play, drama, story-telling, creative writing;
3) Fieldwork and case study;
4) Investigatory projects and project work;
5) Laboratory experiments;
6) Problem-solving exercises;
7) Games and simulation;
8) Interviews and observation;
9) Drawing and calculation;
10) Campaigns, slogan contests and exhibitions;
11) Use of multi-media materials.

Lessons

Lesson 1: Causes and Effects of Degradation of Fresh Water Quality

Activities

a. Organize a brainstorming session to discuss causes of degradation of water quality from human and industrial activities including:
   * indiscriminate disposal of domestic and industrial wastes in bodies of water;
   * multiple and improper use of water for human activities;
   * excessive use of fertilizers and pesticides in agriculture, which seep into bodies of water;
   * deforestation leading to soil being eroded into bodies of water;
   * sediments from non-biodegradable substances left in bodies of water;
   * effluents coming from such industries as heavy metal and mining.

b. Promote acquisition of skills, especially in:
   * identifying problems and finding solutions;
   * performing experiments to test water quality.
c. Initiate actions to actively involve members of the community in:
   * exhibitions, debates, creative writing and slogan contests;
   * campaigns to save bodies of water;
   * good practices related to water conservation.

Lesson 2: Effects of Rapid Population Growth and Development on the Quality of Water

Activities

a. Organize a class discussion on the implications of rapid population growth and development for:
   * the need to produce more food and other essentials;
   * the demand for more land for housing and other social services infrastructure;
   * the production of more domestic waste;
   * the setting up of recreational and entertainment facilities (e.g. golf courses),
   * employment;
   * the need to keep abreast with information and communication technology.

b. Carry out a group analysis on the implications of rapid population growth and development for the quality of fresh water.

c. Visit different sites in the community to show concrete examples of the interconnectedness of rapid population growth, development, and the water quality.

d. Organize class activities, such as drama, role play or debate to discuss the positive and negative implications of rapid population growth and development and their effects on the quality of water.

e. Prepare posters showing how rapid population growth could affect water quality for display in different places in the community.

f. Perform other activities as shown:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Expected Results</th>
<th>Materials Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigation by children</td>
<td>Gather basic information about quality of water</td>
<td>Worksheet to be provided by teacher</td>
</tr>
<tr>
<td>Group discussion</td>
<td>Identify issues, problems, causes of degradation of the quality of water and how to solve the problems</td>
<td>Reading and analysing texts, documents, graphs, charts</td>
</tr>
<tr>
<td>Project work, laboratory</td>
<td>Models showing organisms found in the water</td>
<td>Case study, references, laboratory facilities, resource persons or experts</td>
</tr>
<tr>
<td>experiment</td>
<td>Suggestions on how to maintain quality of water</td>
<td></td>
</tr>
<tr>
<td>Exhibition, campaign</td>
<td>Advocacy and awareness leading to changes in behaviour</td>
<td>Guidelines and resources for organizing exhibitions and campaigns</td>
</tr>
<tr>
<td></td>
<td>Dissemination and sharing of information</td>
<td></td>
</tr>
</tbody>
</table>
Lesson 3: Survey Water Sources in the School Compound

Activities

a. Use the worksheet to:
   * identify natural sources of water;
   * analyse information regarding natural sources of water;
   * identify characteristics of pure water as against polluted water.

b. The worksheet will be used with the following equipment:
   * thermometer;
   * pH paper;
   * beaker or glass to measure 250 ml;
   * microscope, if not available, a magnifying lens.

c. How to use the worksheet

   The worksheet will contain the following information recorded by the learner:
   * observation on the water source;
   * description of the colour, smell and other physical characteristics observed in the water;
   * measurement of water temperature and pH;
   * description of the living organisms found in the water sample.

<table>
<thead>
<tr>
<th>Data Needed</th>
<th>Observation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of water</td>
<td></td>
<td></td>
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<tr>
<td>Colour of water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smell of water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other physical characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lesson 4: Case Study Analysis: the Cause of Minamata Disease

The Case Study

In 1959, the results of an investigation showed that something in the fish that the Japanese people of Minamata ate was to blame. The fish that was caught in Minamata Bay, and eaten by the locals had a high mercury content. Studies have shown that mercury is a poisonous element. It can destroy the nerve cells in the human brain. It can also cause deformities in unborn children and can lead to mental retardation, blindness...
and deformities in young children. Investigators have found out that the mercury found in the fish came from a chemical company which was dumping their effluents containing mercury into the sea. The company employed approximately one-third of Minamata's workforce and provided a livelihood for at least half of the 37,000 people in Minamata, Japan.

To gather more evidence, a laboratory test was conducted in a cat, by allowing the cat to drink water from Minamata Bay. The cat developed the symptoms of the disease, similar to the symptoms that people had, and eventually the cat died. As more evidence was gathered, it was confirmed that the people's ailment and eventual death were caused by a high mercury content in their system — which they got from the fish they ate — fish being their main food source in the fishing village. After nine years of investigation, in 1968, the Japanese authorities officially declared that the chemical company in Minamata was responsible for the cause of the disease, which was later called 'Minamata Disease'. Five years later, in 1973, the chemical company was ordered by the court to pay a total of US$3.5 million in damages to 112 people.

**Strategies**

a. Presentation of the case study

b. Analysis of the case study in groups

c. Discussion of the issues, results of group work

d. Answering questions as follows:

(i) How did the mercury get into the bodies of the people in Minamata?

(ii) Why do you think the company dumped the waste materials into the bay?

(iii) How would the people of Minamata be affected if the company was closed down?

(iv) As members of the community, what could have been done as soon as the problem was identified?

e. For further study:

(i) Find out about the symptoms of mercury poisoning.

(ii) What evidence was gathered to declare that the cause of the problem was the waste materials containing mercury that had been dumped into the bay?

(iii) To prevent future disasters similar to the Minamata case, what actions should be taken by the individual, by the community, by the government, by the company itself?

(iv) From newspapers and magazines, gather reports on similar problems in your country/community, prepare a scrapbook or folder for sharing and discussing in the classroom.
f. For community action:

(i) Conduct a survey of places in the community where possible hazards could take place.
(ii) Prepare a report to the proper authorities so actions could be taken to prevent the disaster.

Lesson 5: Use of Audio-Visual Aids in Discussion of EPD Issues

a. Types of materials to be made available:

(i) Pictures, charts and tables;
(ii) Information sheets for use by the children in group discussion (selected from various documents as mentioned in each material).

b. Types of information available in the materials
   - Basic information on degradation of quality of water

c. Purpose of using audio-visual aids
   - To prepare children for participating in group discussion on quality of water

d. Key concepts to be discussed:

(i) Water cycle;
(ii) Uses of water;
(iii) Impact of human activities on water quality;
(iv) Causes of water pollution;
(v) Ways to improve quality of water.

e. Methods in using the audio-visual materials

The children would use these materials to:

(i) gather background information through studying and analysing data and issues;
(ii) prepare themselves to participate in group discussion.

This will depend on the types of material, various methods of study/learning applied by the children. For example, pictures can be studied and analysed through brainstorming and identifying issues from experience, while data tables can be used through comparison of information.

f. Sample visual aids attached to this lesson (See diagrams and other materials at the end of this package).
Lesson 6: Use of Reference Materials to Guide Experiments or Projects of Children

(Selected from 'Our Khlong Thanon - A Unit of Work' developed by the EE Centre, Rajabhat Institute Phranakhon, UNESCO-PROAP EPD Project, 1995)

Title of Unit: Quality of Water of Khlong Thanon (Thanon Canal)

Purpose: To equip the children to test quality of water through practical experimentation.

Messages:
- Polluted water is not clean water.
- Canal water if not properly managed will become polluted water.
- There are ways of testing quality of water.
- Increased population and construction works alongside the canal degrade quality of water.

Method: Project work/experimentation by the children.

Activity: Comparing canal water with tap water.

The following procedure will be followed:

Step 1: Obtain approximately 1 litre sample each of canal and tap water. Be careful in getting water from the canal.

a. Compare the water turbidity, colour, smell.
b. Use a magnifying lens to observe substances found in the water.
c. Record your observation.

Step 2: Perform an experiment to compare water samples from Khlong Thanon canal and from the taps.

a. Have two set-ups, one for canal water, and the other for tap water.
b. Observe how much substance is left on the filter paper in both set-ups.
c. Record your observation.
d. Answer the following questions:
   (i) Which water sample is polluted. Explain why.
   (ii) Can you use water in Khlong Thanon for drinking and washing? Explain why.
   (iii) What are the possible causes of water degradation in Khlong Thanon?
   (iv) What structures do you see along both sides of the canal?
   v) Where do most people throw their garbage?
   vi) What are the other causes of water pollution in the area?
After completing the activity, write a short story about the Khlong Thanon canal, its problems and how you plan to solve the problems.

Share the information you gained from the activity you just performed with your family, and with friends in the community. Discuss how you can altogether improve the water condition in Khlong Thanon.

**Lesson 7 : The Process of Water Purification**

*Title of unit: Process of Water Purification*

*Purpose:* To help children in experimenting on alternative processes of water purification.

*Messages:* There are ways to treat water in the household. Harmful substances are found in polluted water. We can compare the differences between polluted water and purified water. Rapid population growth can increase the quality of harmful substances in water. Construction waste can increase the sludge in water.

*Title of unit: Household Treatment of Water*  
[Refer to Teaching Aid no. (xiii)]

*Strategy:* Experimentation

*Title of Unit: Process of Water Treatment for the Community*

*Strategy:* Visit to treatment plants and examining water samples; Explanation by experts.

**Process # 1 : Purification through treatment**

Polluted water >> Screening chamber >> Primary setting tank >> Aeration tank >> Secondary setting tank >> Chlorine addition >> Purified water  
[sludge comes out at different stages and accumulates in sludge tanks]
Process # 2: Extraction of oil from used water

Polluted water >> Sink >> Screen chamber >> Screen for water >> Stone-sand chamber >> Drainage for supply of pure water
[Oil is extracted through a pipe and channelled to the tank for oil]

Strategy after field visit: Recording of findings for discussion

a) Illustrate the different kinds of substances you found in the water samples.
b) Discuss the differences found in separating substances from used water and polluted water.
c) How does the purified water different from polluted water?
d) Explain the effect of population increase on the quality of substances in water.

Lesson 8: How can we help solve our water problems?

Strategy: Organizing an exhibition of children's projects/works

Aim of the exhibition: To create awareness of the importance of water, and how to maintain the quality of water.

Target audience: Students and community members

Preparatory work: Students will compile the materials they have produced in their lessons.

To be exhibited:

Posters about water and daily lifestyle;

Demonstration about methodology for testing water quality e.g. pH, turbidity, BOD, COD, microorganisms;

Posters about water-treatment plants: physical treatment, biological treatment, and chemical treatment (these may be presented by pictures, flip charts, models);

Posters about water as a factor for the spread of diseases and water-related diseases;
Other activities related to the exhibition:
   Speech contest on any of the following topics:
   “Water is life”
   “When the water resources lack”
   “How does water pollution affect people in the community?”

Slogan contest on the same topic above.

Creative writing contest on:
   - What is my responsibility to keep water in good quality?
   - What can we do to ensure a continuous and acceptable supply of water?

Lesson 9: Follow-up Action in the Community

a. Student groups may be able to find out how many households have sanitary toilets and water sources fit for drinking and washing. Results of the study could be discussed during the Parents’ and Teachers’ Association meetings to create awareness and motivate the parents to look into the water problems of their households and the community.
4.3 Exemplar 2: Disposal of Waste Products

Introduction

Waste can be reduced, reused, recycled, and recovered (4R's). There are various ways to dispose of waste properly.

Target Group

This instructional material is designed for the upper primary school pupils (Grades 4-6). The topics on the environment and ecology are given more emphasis at this level.

Enabling Objectives

The teaching-learning experience should allow the learners to be able to:

1. name common sources of garbage;
2. classify waste products accordingly;
3. briefly explain the effects of garbage on man and the environment;
4. identify good practices of treating garbage or waste product;
5. suggest environment-friendly way/simple technology to treat garbage;
6. identify a place with many people and one with fewer people;
7. compare the amount and type of garbage produced and give some reasons why this happens;
8. briefly explain how development in the locality contributes to the waste problems;
9. share one's contribution to solving local waste problem through reduction, recycling, reuse and recovery.

Issues

Environment

Indiscriminate waste disposal leads to:

1. environmental problems such as clogging of sewers, pollution of air, water and soil;
2. poor sanitation that affects the aesthetic condition of the community; and
3. health problems in humans such as respiratory ailments, and spread of water- and air-borne diseases.

Population

1. Increase in the number of people in the locality tends to increase the amount and types of garbage;
2. Varied human consumption leads to numerous wastes problems;
3. Humans have many uses for garbage from homes and industries; and
4. Humans have a role to play in lessening the garbage problems.
Development

1. Development in localities can lead to serious problems related to waste disposal.
2. The waste disposal problem exists because most consumer goods are destined to be purchased, consumed and discarded with little regard for their remaining value.
3. Garbage is either hauled long distances to sanitary landfills, burned in incinerators designed to recover energy, or separated to retrieve valuable materials for recycling.
4. There are environment-friendly technologies which can be developed to treat human and industrial wastes.

Concepts to be developed/evolved

1. Waste products come from different sources.
2. Waste products affect man and the environment.
3. Waste products may be classified according to their common characteristics.
4. There are many ways of treating waste products, some are beneficial, others are not beneficial to man and his environment.
5. Technology plays an important role in treating as well as in producing garbage.
6. Everybody has a role to perform in reducing garbage problems.
7. Increase in the number of people tends to increase the amounts and types of garbage.
8. As the locality becomes urbanized, there are possibilities of increase in waste products.
9. There are environment-friendly technologies which can be developed to treat waste.

Content Areas

1) Factors that contribute to the problems of waste disposal:

- Rapid population growth;
- Improper use of technology;
- Varied human consumption;
- Behaviour/attitude of people.

2) Problems related to waste / effects of waste:

- environmental problems: health, clogging of sewers, air, water, land pollution;
- respiratory ailments, sanitation, water-borne, air-borne diseases.
3) Sources of wastes:
   - Household;
   - Industries;
   - Hospitals;
   - Special sources/others.

4) Classification of wastes:
   - Solid: plastic, paper, metal;
   - Liquid: kitchen wastes;
   - Gaseous;
   - Special wastes: nuclear waste from hospitals or pharmaceutical industry etc.
   or
   - biodegradable (organic wastes — vegetable and fruit peelings, rice straw, animal manure etc.)
   - non-biodegradable (inorganic wastes — styrofoam, plastic, etc.)

Methodology/Teaching-Learning Strategy
   - Interview;
   - Role play;
   - Laboratory test;
   - Research, surveys;
   - Approaches to higher-order thinking and emotional development;
   - Case study;
   - Field visits;
   - Multi-media.

Expected Outcomes

1) Awareness of issues;
2) Identification of problems, finding solutions, economic benefits, e.g. livelihood.

Resources/Partnerships/Networking
   - School-community partnership;
   - Partnership with media, NGOs and community organizations;
   - School-industry partnership;
   - Government support — policies/infrastructure.

General Skills to be Developed
   - Higher-order thinking skills;
   - Creativity — invention, innovation;
   - Practical skills;
   - Use of appropriate technology;
   - Community participation and ownership;
   - Action and follow-up activities at home and community.
**Attitude/Behavioural Change Expected**
- Emotional involvement;
- Personal commitment to reduce waste;
- Concern for others and the physical environment;
- Social responsibility;
- Lifestyle modification — reduction of 'wants';
- Awareness of effects of rapid population growth;
- Positive attitude to conserve resources.

**Specific Process Skills to be Developed**

After going through this instructional activity, the pupils are expected to develop the following process skills: observing, classifying, inferring, predicting, and communicating/reporting. Positive values are also expected to be developed through the interactive group work like orderliness, co-operation, and respect for the opinion of others.

**Materials/Devices Needed**

For the pupils: Worksheets, activity sheets
For the teacher: Chalkboard, OHP and transparencies, drawings, sample recycled materials.
Multimedia/IT may be used wherever appropriate.

**Learning Sequence**

1. **Pre-Test**
   - may not be formal (e.g. value classification or simple activities) to obtain an indication of student's existing knowledge or attitudes.
   - may be structured for individual assessment of the lesson's objectives.

2. **Induction:**
   - Motivation through stimulus, e.g. audio-visual use of still pictures to encourage or to start a discussion or critical observation or value clarification;
   - Arousal of the pupils' interest by comparing two kinds of surroundings: one dirty and one clean, then make them answer the following questions:
     - What makes the place dirty?
     - What do we call these materials that make the place dirty?
     - Will you choose to stay in this kind of surrounding? Why?
     - Do you think we can do something to make the place clean?
   - Presentation of the day's learning activity.
3. **Group Work Using the “Activity Technique”**

(See attached Annex 1 to 6: procedures and worksheets, fieldwork, case studies). The worksheets covered only points 5a to 5d. You should provide other activities or materials for fieldwork/case studies for 5e to 5i.

4. **Processing of Results**

- Group report — to be done by the leader of each group;
- Interactive discussion:
  * On the classification of waste products:
    • Number of groups involved in the discussion;
    • Basis for classification
  
  *(Note: Introduce “biodegradable” and “non-biodegradable” materials if the pupils were not able to use such terms)*

  * On the sources of garbage:
    • Where the waste materials come from;
    • The value of throwing away all waste materials;
    • Effects of not removing garbage properly.

  * On the ways of dealing with garbage:
    • Effects of burning, burying, filling landfills, throwing into bodies of water on people and on the environment;
    • Other ways of removing garbage;
    • What a pupil of science can do to help lessen the garbage problem in the home, in school, and in the community.

  * On the general effects of garbage on man and environment:
    • Bad effects;
    • Good effects;
    • Development in the locality and the disposal of waste;
    • Road construction process and its contribution to the waste problems;
    • Existence of the supermarket in the locality and its contribution to the waste problems.

  * Population growth and waste problems:
    • Compare the amount and types of waste in a place where there are fewer people compared to a place where there are more people;
    • Suggest reasons for the difference in the amount and types of waste produced.
* Lifestyle and waste problems:

Ask your parents to tell you a story about their lifestyle 20 years ago as compared to their present lifestyle. Ask them questions that relate to the garbage problem. For example, the types of waste products they produce in the household; the way they dispose of their garbage; the materials they use in wrapping their food; etc.

* Waste management technology:
  - Suggest simple environment-friendly technologies to treat waste;
  - Suggest ways of overcoming waste problems;
  - Give an example of ways to overcome the waste problem with reference to the 4R’s.

5. Summary

To summarize the results of the discussion, you may use the suggested table:

<table>
<thead>
<tr>
<th>Sources of waste product</th>
<th>Classification of waste</th>
<th>Effects of waste on man and environment</th>
<th>Ways of treating waste</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Development in the locality and waste problems</th>
<th>Population growth and waste problems</th>
<th>Lifestyle and waste problems</th>
<th>Waste management technology</th>
<th>Ways of overcoming waste problems</th>
</tr>
</thead>
</table>

6. Provide pupils with ‘idea cards’

Use pictures, illustrations or information technology animation with key ideas on them. Ask the students to arrange these cards so that they form a concept map to organize their ideas showing the interaction of environment, population and development.

7. Application of concepts

Using the key concepts identified, allow students to relate their learning by forming concept maps, especially highlighting the inter-relatedness of issues.
8. **Action-oriented Step**

Give assignments to pupils by giving directions on the following:

- Plan an activity they will do at home to help their parents in cleaning or maintaining their environment. Discuss the plan with the class. Conduct the activity in the home or the community. Allow the pupil to report as scheduled.

- Organize the pupils in groups of five. Assign them to prepare a story, story board, drama, song, or illustrated comics based on the diagram below. Allow them longer time to brainstorm and develop their strategy and their story. Once done, make them report to the class.

*NB. Effects will be positive and negative reflected by illustrations, pictures or animation*
9. Other Suggested Activities

ACTIVITY 1: Predict the Source

The box contains common waste materials. Predict the original source of each material.

Use Worksheet 1 for your answers.

WORKSHEET 1

Group: __________________

<table>
<thead>
<tr>
<th>Name of Waste Product</th>
<th>Prediction of source of the waste products</th>
<th>Reason for your answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>p l a n t s</td>
<td>a n i m a l s</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td></td>
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<td>5</td>
<td></td>
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<td>6</td>
<td></td>
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<td>7</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY 2: Grouping of Waste Products

Inside the envelope are names of waste products.
1. Arrange them into groups
2. Which materials go together in a group?
3. Which materials go together in other groups?

Use Worksheet 2 for your answers.

CONTENTS OF THE ENVELOPES

<table>
<thead>
<tr>
<th>ANIMAL MANURE</th>
<th>OLD NEWSPAPERS</th>
<th>EMPTY BOTTLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE CREAM CONTAINER</td>
<td>USED PETROL</td>
<td>SMOKE FROM VEHICLES</td>
</tr>
<tr>
<td>CANDY WRAPPERS</td>
<td>OLD SLIPPERS</td>
<td>PLASTIC BAGS</td>
</tr>
<tr>
<td>FRUIT PEELINGS</td>
<td>SOFT DRINK BOTTLES</td>
<td>WOOD SCRAPS</td>
</tr>
<tr>
<td>DRY LEAVES</td>
<td>METAL SCRAPS</td>
<td>BISCUIT TINS</td>
</tr>
</tbody>
</table>

WORKSHEET 2

Group: __________

How many groups of waste products did you make? Write the names of the materials that go together in a circle. If you grouped the materials into two, use two circles only, if you group them into three, use three circles, if you were able to group them into four, use four circles. If you grouped them into more than four, make additional circles at the back of your worksheet.
ACTIVITY 3: Treatment of Wastes

These pictures show how waste may be treated. Study them, then discuss with your partner what you know about the ways this particular waste may be treated.

Use Worksheet 3 for your answer.

WORKSHEET 3

Write down what you and your partner discussed about the way the specific waste in the picture should be treated.

Name of waste

How it should be treated
### ACTIVITY 4: Biodegradable and Non-biodegradable Waste Products

You have lists of waste products in the outer, middle and inner circle. Classify the products as follows:

Outer: Biodegradable  
Middle: Non-biodegradable  
Inner: Special way of disposal/treatment

<table>
<thead>
<tr>
<th>Outer Circle</th>
<th>Middle Circle</th>
<th>Inner Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken glass</td>
<td>Scrapwood from construction</td>
<td>Broken jewellery</td>
</tr>
<tr>
<td>Broken brick</td>
<td>Old ballpens</td>
<td>Empty tins</td>
</tr>
<tr>
<td>Bark</td>
<td>Fruit peels</td>
<td>Liquid waste</td>
</tr>
<tr>
<td>Sawdust</td>
<td>Plastic bags</td>
<td></td>
</tr>
<tr>
<td>Branch</td>
<td>Smoke of vehicles</td>
<td></td>
</tr>
<tr>
<td>Leaves</td>
<td>Cookie tins</td>
<td></td>
</tr>
<tr>
<td>Smoke</td>
<td>Home sewage</td>
<td></td>
</tr>
<tr>
<td>Torn shoes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torn school bag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scraps of paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rags and used clothing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empty cardboard boxes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expired medicines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouldy bread</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water containing cooking oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissolved detergent waste liquid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used oils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dead mouse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY 5: Behavioural Change

1. Value Clarification

Allow the pupils to answer the following questions:

You have unwrapped a piece of candy. Where will you throw the wrapper? Explain your answer based on the effect on the environment.

2. Setting Norms

Start the lesson by using pictures showing correct practices on waste disposal. Select one correct practice. Classify whether the practices are good or bad. Write your answers on the column provided below:

- Putting garbage in a bin.
- Dumping garbage in a river.
- Throwing scrap paper on the floor.
- Always selecting garbage to put in the right bin.
- Always forgetting to take empty coke cans from the table to the bin.
- Never finishing food on the plate.
- Always recycling or composting garbage.
- Always burning leaves.
- Never keeping classroom clean.
- Always keeping home and garden clean.

<table>
<thead>
<tr>
<th>Good Practices</th>
<th>Bad Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY 6. Making a Collage: Use of Non-biodegradable Plastics

1. Make pupils gather used plastic products.

2. Create a display that shows how the above items get into bodies of water — in rivers, beaches, canals.

3. Show how the plastics damage living organisms and degrade beaches.

4. Display might also include information about recycling plastic items, such as using recyclable and reusable glass, containers.
Chapter 5

Recommendations and Suggested Areas for Follow-up Actions

To follow up on the learning which took place during the Regional Training Workshop, the participants believed that the recommendations should reflect the process, which was the more important outcome. The following recommendations were therefore, put forward by the workshop.

For the Participants

1. To make the workshop report available to colleagues in their institutions;
2. To try-out the teaching-learning materials in a small scale, using the facility within their reach;
3. To develop additional exemplar teaching-learning materials on other emerging concerns, with separate packages for the different educational levels;
4. To undertake research-based projects showing the inter-relatedness of environment, population and development;
5. To continue the exchange of information and experiences among themselves.

For the Institutions and Agencies

6. To support the networking of institutions and agencies at the national, sub-regional and regional levels;
7. To continue mobilizing resources in order to organize similar regional activities, and to develop exemplar teaching-learning materials on other emerging concerns.

As a suggestion for follow-up actions, an example of a project proposal was presented. Other participants are expected to prepare their own project proposal to answer the emerging needs in their own localities.
Example of a Project Proposal

An example of a project proposal derived from recommendation 4 is shown below:

**Project Title**
Integration of EPD Concerns in the Syllabi on Population Education and Community Health for Pre-Service Training in the Philippines

**Project Proponent**
Ms. Fe. C. Garcia, Ph. D.
Associate Professor
College of Education
University of the Philippines

**Project Justification**

1. There is a lack of integration of environmental and developmental topics in Population Education, and Community Health, subjects offered in the existing Bachelor of Science in Education, major in Health Education curriculum.

2. The syllabi of the two subjects can be relevant and comprehensively tackled if EPD concepts are covered.

3. The revised syllabi for the above-cited subjects need to infuse concepts on environmental management which have socio-economic dimensions.

4. Opportunities have to be maximized for the utilization of supplementary materials recently made available by the Department of Environment and Natural Resources, Environment Management Bureau (DENR-EMB) and the Institute for Science and Mathematics Education, University of the Philippines (UP-ISMED).

With this revision, it is hoped that the syllabi for Population Education and Community Health will be enriched by subsequently inputting Knowledge, Skills, Attitude, and Action using the EPD paradigm.

**Project Objectives**

The revised syllabi will aim to provide opportunities for the Health Education faculty to actually cooperate and participate in the revision process. Specifically, this endeavour will:


2. Analyze the extent of the incorporation of development and environmental concepts in the pre-service curriculum.
3. Ensure that the revision to the programmes to be undertaken is well-organized, effective and sustainable.

4. Provide networking opportunities between the University, the relevant government agencies and the environment-oriented NGOs.

**Project Details**

**Time Frame**: Three months

**Target Groups**: Health education students

**Objectives**

1. To provide revised syllabi for pre-service students, taking subjects in Population Education and Community Health;
2. To enhance the knowledge, attitudes and skills on EPD, including interpersonal and management skills.

**Output**

1. Revised syllabi for Population Education and Community Health;
2. A well-planned programme designed for the two subjects, Population Education and Community Health.

**Methodology**: Brainstorming, discussion groups, concept mapping, inviting resource persons.

**Input**: Trained personnel and experts;
Equipment and facilities;
Better collaboration and networking with other agencies.

**Institutional Arrangement**

The faculty of the Health Education Department of the College of Education, University of the Philippines, seeking approval of the Curriculum Committee and the Dean of the College will be responsible for the project inputs and outputs. The Department has the mandate to carry out periodic revisions of the content of the course syllabi for the Population Education and the Health Education curriculum.

**Project Risks**

The project may be at risk, due to lack of funds and support from the other members of the department. The desired outcome may not be realized during the stipulated time.

**Funding Required**

A budget of Pesos 20,000 to cover the cost of meetings, supplies, materials and administrative support.
Chapter 6

Report on Field Visit to the Environment Management Education Centre

The field visit was organized to provide participants with a first-hand experience in the transformation of a mangrove forest into an area where development has taken over due to rapid urbanization and population growth.

The degradation of mangrove forests in many tropical countries with long coastlines has been caused by industrial logging for timber and wood for fuel, conversion to ponds for raising fish, shellfish and shrimps, and conversion into agricultural land or development/industrial areas.

The mangrove is a valuable natural resource. It helps to protect the coastline from erosion, reduce damage from storm, trap sediment washed off from the land, and provide breeding, nursery and feeding grounds for some 2,000 species of plants and animals.

The Mangrove Field Study Centre

The Centre was set up in 1985 with UNESCO and IPST support, under the coordination of Rajabhat Institute Phranakhon, Rajabhat Institute Phetchaburi and Bang Tabun Witthaya School. It was utilized as a source of teaching-learning as well as to build awareness about the importance of the mangroves under a project “Developing the School Area for Teaching-Learning Biology and Environment”.

The Centre is located 123 kilometres south of Bangkok. Before the Centre was set up, students walked in the mud for their field activities in the mangrove. This has led to a serious destruction of the mangrove ecosystem. To prevent further destruction, a 500-meter long boardwalk was constructed. Walking along the boardwalk, students see different trees and animals such as the fiddler crabs, snapping shrimps and mud skippers. Students are guided by a workbook developed as part of the project.

There are four zones, the division of which is based on dominant plant species, namely: Sueda, Rhizophora, Avicena and Seaward Foreshore. Study stations are designed and puzzle boards are set up in each station. Students, while on their observation trip, stop and read questions on the board which they have to answer. The activities set up in the mangrove area are on sensory awareness, aimed to build up appreciation of the mangrove forest and the micro-organisms found in it.

The Field Study Centre is a place where students learn about the mangrove ecosystem, thus instilling in both students and teachers awareness and concern about the natural resource.
Transformation of the Mangrove Area, An Observation Activity

Thirty minutes before reaching the mangrove area, the participants recorded their observation on the ‘pattern of land use’, from the city centre up to Bang Tabun. On the way back, an urban study was conducted, and an observation sheet was also used to study the city centre and the Marketplace of Phetchaburi. An observation worksheet as shown, was used.

Example of Observation Worksheet

Study Area: City centre of Phetchaburi
Direction: Please encircle your observation on the following as we travel around the city centre

<table>
<thead>
<tr>
<th>Code</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>good</td>
<td>average</td>
<td>poor</td>
</tr>
</tbody>
</table>

Indicate your remarks.

<table>
<thead>
<tr>
<th>Environmental Issues</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Main Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Traffic Situation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Air Pollution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Noise Pollution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Road Cleanliness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Marketplace</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Arrangement of Goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Drainage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Waste Disposal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Water Availability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. General Sanitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. General Cleanliness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impression of the Field Study Visit

The visit broadened the participants’ concept about the interconnectedness of environment, population and development. They had opportunities to see for themselves the problems brought to the environment by rapid population growth and urbanization as well as technological and industrial developments. They also had a chance to observe the socio-economic benefits of development.
1. Water Cycle and Sources of Watershed Pollution  
(Source: Adapted from G. Tyler Miller Jr., Living in the Environment: An Introduction to Environmental Science, Wadsworth Publishing Co., Belmont, Ca. 1992)

2. Water in Our Lives  
(Source: Green World Series, Green World Foundation under the Patronage of HRH, the King’s Sister)

3. Impurities Found in Drinking Water  
(Source: Science Across Asia and the Pacific at SEAMEO-RECSAM/BP, 1993)

4. Impact of Human Activities on Quality of Water  
(Source: same as (2) above)

5. Let’s Think about It  
(Source: same as (2) above)

6. Cause-effect Relationship  
(Source: IPST, Thailand)

7. More Population, More Pollution  
(Source: IPST-UNESCO/PROAP Project, 1990)

8. The Industrial Need of Water  
(Source: UP-ISMED, 1988)

9. Clean Water for Life  
(Source: CAST, China)

10. How Is Water Purified?  
(Source: Same as (3) above)

11. Water for Everyone  
(Source: Bato Balani, Junior Vo. 13, No.3, Philippines)  
(Source, IPST, Thailand)

13. Water Treatment  
(Source: Same as (8) above)
WATER CYCLE AND SOURCES OF WATERSHED POLLUTION

Source: Adapted from G. Tyler Miller, Jr., Living in the Environment: An Introduction to Environmental Science, 7th ed. (Wadsworth Publishing Company, Belmont, CA, 1991), Figures 4-34 and 22-2
Water in Our Lives

The water we use for drinking and washing in everyday life originated on the earth for 4,600 million years.

We also use water for other purposes such as transportation, industry, cattle feeding, farming, recreation, etc.

Energy from the sun, water on the earth, soil and air support the Biosphere and Biodiversity.

Source: Green World Series, Green World Foundation under the Patronage of HRH the King’s Sister
Impurities Found in Drinking Water

Countryside: Dissolved minerals, aluminium

Pollution in air

Run-off from farmland, e.g. nitrates, pesticides

Leaching into aquifers

(Source: Science Across Asia and the Pacific at SEAMEO-RECSAM/BP, 1993)
Impact of human activities on quality of water

A case study of Chao Praya River in Thailand

The more dense population in the province, the worse quality of water in the river

The dissolved oxygen (DO), Biological Oxygen Demand (BOD), and Coliform bacteria were tested from water in Chao Praya River in Bangkok, Ayuthaya, water and Nakornsawan Province.

Source: Green World Series, Green World Foundation under the Patronage of HRH the King's Sister
Cause-effect Relationship

(Source: IPST, Thailand)
Let's Think about It!

Source: Green World Series, Green World Foundation under the Patronage of HRH the King's Sister
More population more pollution

- Water pollution
- Temperature
- Acid rain
- Air pollution
- Radio activity waste
- Waste
- Fertilizer
- Industry
- Nuclear power
- Need more food
- Need more clothes
- Need more cars
- Need more power supply

Source: IPST-UNESCO PROAP PROJECT 1990
The Industrial Need of Water

(Source : UP-ISMED, 1988)
Clean Water for Life

(Source: CAST, China)
How Is Water Purified?

(Source: Same as (3) above)
Water for Everyone

(Source : Bato Balani, Junior Vo.13, No.3 Philippines)
(Source : IPST, Thailand)
Water Treatment

(Source: Same as (8) above)
Annex I

Provisional Agenda and Schedule of Work

Provisional Agenda

1. Opening and Welcoming Ceremony
2. Briefing about the Workshop and the Procedure of Work
3. Sharing of Experiences, Country Presentations and Identification of Trends and Issues
4. Presentation of EPD Framework and Development of Guidelines for the Tasks on Hand
5. Review and Analysis of the Existing Materials
6. Revising the Existing Materials
7. Study Visits
8. Formulating Plans for Try-out
9. Recommendations for Follow-up Actions
10. Review of Agreements and Closing of the Workshop
Schedule of Work

Sunday, 16 November 1997

Arrival of Participants

Monday, 17 November 1997

08:30 - 09:00  Registration

09:00 - 10:00  Opening Ceremonies

*Emcee* - Ms. Chantana Anulavup

Programme

*Welcome Remarks* - Dr. Thongchai Chewprecha
Director, IPST

*Mrs. Lucille Gregorio*
Specialist in Science and Technology Education, UNESCO

*Keynote Speech* - Dr. Suvit Yodmani
Regional Director
UNEP

*Introduction of Participants and Resource Persons*

*Ms. Nantiya Boonklurb*
Asst. Director and Chair Organizing Committee
IPST

*Closing Remarks* - Dr. Pisarn Soydhurum
Deputy Director, IPST

10:00 - 10:30  Morning Break

10:30 - 12:30  Plenary Session 1

*Facilitator* - Dr. Ruben Umalay

*Presentations (Maximum of 10 minutes each)*
Objectives and Outcomes of the Workshop - Mrs. L. Gregorio

Projects and Programmes Linking Environment, Population and Development -

- UNEP  Mr. M. Pradhan
- UNFPA  Ms. C. Villamueva
- RECSAM  Dr. A. Binadja
- UNESCO  Mrs. L. Gregorio
- IPST  Dr. Sunee Klainin

Sharing of Country Experiences

- Bangladesh  Mr. Ehsanur Rahman
- Brunei  Haji Abdul Hakip b. H. Burut, Haji Suhaaila b. H.A. Darim
- China  Mr. Peng Xi
- India  Dr. J.P. Gupta
- Indonesia  Dr. Anna Poedjadi
- Lao PDR  Ms. Viengvichit and Mr. Bounchanh
- Philippines  Dr. Fe Garcia
- Thailand  Dr. Pramual Siripankeaw

Brief discussion will follow each presentation.

Outcome of the session: Identification of Trends and Issues in the Region to be discussed in the next session.

12:30 - 14:00 Lunch Break

14:00 - 15:30 Synthesis and Discussion on Trends and Issues in the Region

15:00 - 16:00 Afternoon Break

16:00 - 17:30 EPD Framework in Asia and the Pacific and Presentation of Exemplars

Outcome of the session: Adoption of the EPD Framework

17:30 - 18:30 Free

18:30 - 21:00 Reception Dinner
Tuesday, 18 November 1997: Plenary Session 2 and Workshop Sessions

08:30 - 09:30 Plenary: Review of the EPD Framework

**Facilitator for the Plenary:** Dr. J. P. Gupta

*The framework and the exemplars will be reviewed by the workshop, followed by discussion.*

09:30 - 10:30 Group Work: Identification of Core Messages, Teaching-Learning Strategies, and Student’s and Teacher’s Activities

*The groups will suggest guidelines that could be followed in the preparation of teaching-learning materials. The group members will decide the levels which they will work on — primary, secondary or teacher-training level. Each group will choose their facilitators and rapporteurs.*

10:00 - 10:30 Morning Break

10:30 - 12:30 Group Work (continued)

12:30 - 14:00 Lunch Break

14:00 - 15:30 Group Work (continued)

15:30 - 16:00 Afternoon Break

16:00 - 17:30 Plenary Session 3 - Reporting by Groups

*Each group will report in plenary the outcomes of their group discussion. Outcome of the session: Identified Core Messages, with Corresponding Teaching-Learning Strategies and Student and Teacher Activities. The outcomes will be the basis for the development of teaching-learning exemplars.*

Wednesday, 19 November 1997: Plenary Session 4 and Group Works

**Facilitator:** Mr. Mahesh Pradhan

08:30 - 10:00 Plenary Session 4: Report of Synthesis of Outcomes of Previous Day Discussion

Group Work: Preparation of Teaching-Learning Exemplars
The plenary presentation will be followed by group work to prepare exemplar lessons based on the identified core messages, teaching-learning strategies and student and teacher activities. Each group will choose their own facilitator and rapporteur.

10:00 - 10:30 Morning Break
10:30 - 12:30 Group Work (continued)
12:30 - 14:00 Lunch Break
14:00 - 15:30 Group Work (continued)
15:30 - 17:30 Plenary 5: Reporting of Group Work

The reporting will be followed by discussion, including suggestions for improving the exemplars. The output will be collected and typed during the next day, while the participants are out for the field visit.

Thursday, 20 November 1997: Field Visit to the UNESCO-IPST Project on Environment Management Education Centre at the School Level, Bang Tabun Witthaya School, Phetchaburi Province

Facilitator: Ms. Laddawan Kanhasuwan

06:15 Bus leaves IPST for Petchaburi

Programme

Welcoming and Briefing by School Officials
Visit to Project Site
Lunch
Visit to Cultural Sites

16:00 Return to Bangkok

Friday, 21 November 1997: Group Work and Plenary

Facilitators: Dr. Fe Garcia and Mr. Ehsanur Rahman

08:30 - 10:00 Review of Exemplars by Respective Groups
10:00 - 10:30 Morning Break
10:30 - 12:00 Formulation of Recommendations for Follow-up Actions
12:00 - 12:30 Closing Ceremony and Awarding of Certificates of Participation

Facilitator: Ms Annete Gueveya

Programme

Opening Remarks
Impressions
Awarding of Certificates of Participation
Closing Remarks

12:30 - 13:30 Farewell Lunch

13:30 Free

Saturday, 22 November 1997 Departures
Annex II

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Annex III

Opening Ceremony Remarks and Keynote Address

1. Welcome Remarks by

Dr. Thongchai Chewprecha, Director, IPST

Dr. Suvit Yodmani, Regional Director of UNEP,
Mrs Lucille Gregorio, UNESCO Specialist in Science and Technology Education,
Our dear participants, Colleagues, Friends, Ladies and Gentlemen:

Sawadi krab! This is our Thai greetings of welcome. On behalf of IPST, and on my own behalf, I am very pleased to welcome you all to this important Workshop ‘Education for Sustainability,’ that we are organizing in collaboration with the UNESCO and UNEP Regional Offices in Bangkok, the agencies tasked for following up Chapter 36 of Agenda 21, containing the recommendations of the United Nations Conference on Environment and Development or the Earth Summit held in 1992 in Rio de Janeiro, Brazil. I am very grateful to all of you for accepting our invitation to come to Bangkok despite the information floating around that Thailand is in a crisis — both in the economic and political scene. I am not going to deny that, but I assure you that the IPST staff and myself will try to provide you with the usual Thai hospitality that we are known for especially during your stay with us.

I was made aware that this Workshop is being organized to implement UNESCO’s inter-disciplinary project ‘Environment and Population Education and Information for Development (EPD)’ launched in 1994. This is not the first activity as several consultations have taken place. In fact we are implementing one of the recommendations put forward during the Beijing consultation in 1995, that is “to develop research-based prototype teaching-learning materials which illustrate EPD integration and focus on emerging concerns.” With your expertise brought here, I am confident that this Workshop will be able to produce some exemplars which could be tried-out and later introduced in both formal and non-formal systems of education.

You have a full programme for the week, but I noticed that a field visit is being organized to see an environmental education site in one of our schools in Phetchaburi Province. This was initiated with UNESCO support. I hope that after seeing the project, you will be able to give us your recommendations on how to keep the project going, keeping in mind the new thrust of integrating environment, population and development.

Another project which was undertaken in Bangkok following this new thrust was on “Urbanization and Development”, undertaken by the Environment Education Centre, Rajabath Institute Phranakhon. The project was undertaken because of one major concern affecting major cities — that is urban migration which led to environmental, social and moral degradation. Bangkok has approximately 10 million people, which is 15% of Thailand’s population. The carrying capacity of the city is highly affected. The city is known for it’s traffic jam, high level of air and water pollution, etc. I was informed
that the project has come out with teaching-learning materials and educational campaign materials. I hope you will have a chance to examine the teaching-learning materials they have developed using the inter-disciplinary integrated ‘taking-action’ approach.

My friends, you have been selected to assist us in meeting the objectives of this week’s activity. I am sure that with your commitment and dedication we will be able to move forward in showing to the teachers how to implement “education for sustainability,” a new approach which aims not only to solve problems related to the environment, population and development but hopefully, with integration, we will be able to solve one of our biggest problems in schools, the curriculum overload.

Finally, I wish to inform you that my colleagues at IPST are available to assist you if you need their help. Please do not hesitate to approach any of us for assistance. Once again welcome to you all, and may you have an interesting week ahead of you.

Thank you.

2. Remarks by

Mrs. Lucille C. Gregorio
Specialist in Science and Technology Education
UNESCO, Bangkok

Fellow Participants, Colleagues
Friends
Ladies and Gentlemen

On behalf of UNESCO and on my own personal behalf, I would like to welcome you to this regional workshop. It is with great pleasure that we are organizing this activity in collaboration with the UNEP Regional Office and with IPST. Allow me to express my gratitude and appreciation to UNEP for providing technical and financial support; and to IPST for providing all the necessary facilities and assistance to make this workshop possible. In this week-long activity, we are implementing one of the recommendations of the first workshop organized in Beijing in 1995, that is, the “development of teaching-learning materials.” There were two other workshops organized within the EPD Framework after Beijing, the 1995 sub-regional workshop on “Alternative Strategies for Assessing Science, Technology and Environment Literacy for Girls and Women,” organized by SEAMEO-INNOTECH in Manila; and the 1996 Asia Regional Study Directors’ Meeting on “Socio-Cultural Factors Affecting Demographic Behaviour and Implications for the Formulation of Population Policies and Programmes” held at UNESCO-PROAP. I am pleased that this fourth workshop is being organized in one of the “Centres of Excellence” of Thailand, which is recognized not only regionally but internationally, the Institute for the Promotion of Teaching Science and Technology.

Allow me to explain briefly about this project, EPD, an acronym for “Environment and Population Education and Information for Development.” The new agenda for action put forward, suggests a more relevant title, “Education for Sustainability” which we have adopted as the title of this workshop. The project was approved in 1993, with
overwhelming support from the Member States during the 27th session of UNESCO's General Conference. EPD was launched in 1994, and conceived on the basis of the recommendation of the United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 1992, Agenda 21, Chapter 36 and the International Congress on Population, Education and Development (ICPED), Istanbul, 1993. The project emphasis is on the integrated nature of new types of education, the inter-disciplinarity of the content relating to population, environment and development. As we know, this is not a new approach — therefore, the conceptualization of the substance as it is, is to update and refine the knowledge base and the communication strategies for different target groups. For our target in this workshop — we will look at the school setting. Considering your expertise and experience, we would like you to help us prepare teaching-learning materials which could be used in the classrooms, especially paying particular attention that we are not creating additional load on the curriculum, to the textbooks, to the teaching-learning materials, to the teacher-training programmes and to the learner. We would like to show that environment, population and sustainable human development are interrelated. Though the interrelationship is complex as it involves socio-cultural, political, religious, economic and scientific and technological overtones, our aim is to prepare a ‘total person’ with a better quality of life. It is in this context that the educational actions, including information and training addresses the concerns in an integrated manner.

Finally, I would like to express my gratitude to all of you for your co-operation. I wish you a pleasant stay in Bangkok.

Thank you.

3. Keynote Address by

Dr. Suvit Yodmani
Regional Director & Representative for Asia and the Pacific, UNEP

Ladies and Gentlemen,

“Caring for the Earth” jointly prepared by the World Conservation Union, the World Wide Fund for Nature and the United Nations Environment Programme in 1991 proclaimed that humanity is at risk because it is misusing natural resources and pushing the Earth to the limits of its capacity. “We are now gambling with the survival of civilization,” warned the book in its preface.

In the years following this ominous warning, the planet is not in much better shape. The environment is in danger on nearly every front. Every time we pick up a newspaper, we read about something that is threatening our very existence, as well as that of other forms of life with which we share this planet. For example, every 24 hours, an estimated 150 to 200 species of life become extinct. During the same period, the human population on Earth expands by a quarter million. If it is not the ozone issue, it is global warming and if not that, then toxic and hazardous waste in our water. Our landfills are filling up so fast, we are running out of room in which to dump our rubbish. Our forests are disappearing at a rate too fast for them to be replaced. These are but a few of the many problems that are threatening the carrying capacity of our planet Earth.
The last two decades have witnessed a remarkable public awakening. There has been revolution in awareness and understanding of environmental issues, a growing sense of urgency, a knowledge that environmental protection is not the luxury of the rich, a realization that we share one, finite earth and that all of us are responsible for what happens to it. A growing number of people — ordinary citizens, executives, government officials, religious leaders, and journalists — are beginning to recognize that their long-term aims and activities and environmental conservation are mutually dependent not mutually exclusive.

Around the world, people of every culture and political persuasion are organizing — to plant trees in Kenya, to protect watersheds and mangrove swamps in the Philippines and to demand dependable water supplies and sanitation in India. They have realized that many global environmental problems are rooted in local environmental conditions and that action at the local level is often the first step toward a global solution. After all, the decisions we make daily as consumers, as professionals and even as parents and homemakers can shape the world our children and grand-children will inherit.

Ladies and Gentlemen,

The idea of sustainability was first conceived in relation to the use of renewable resources, that an activity is only sustainable inasmuch as it can continue indefinitely. If a renewable resource is exploited and used faster than it can regenerate itself, the premise states, the resource will eventually be depleted and hence its use will not be sustainable. Living sustainably means understanding and accepting the consequences of being a part of a greater community of life and becoming more conscious of the effects our actions have on future generations and the other species with whom we share this planet. Because sustainability is a relatively new concept and often runs contrary to established paradigms of social and economic behaviour, ensuring that sustainability is in fact "sustainable" will require a new ethic of living. In order for it to succeed, "sustainable living" must also be the new pattern of all sectors and levels of society — individuals, organizations, communities, nations and the world. The new patterns must be promoted and accepted by youth, women, men, rural people, urbanites, religious organizations, and all other groups of which a society is composed. Adopting this new pattern of sustainability will necessitate a fundamental change in the attitudes and practices of many people in each of these sectors. It will require that people adjust their lifestyles and adopt pursuits that respect and work within nature's limits. Sustainability can be accomplished without rejecting the many benefits that modern technology has brought civilization, provided the technology works within those limits.

The principle reflects the duty of care for other people and other forms of life, now and in the future. It is an ethical principle. It means that development should not be at the expense of other groups or later generations. We should aim to share fairly the benefits and costs of resource use and environmental conservation among different communities and interest groups, among people who are poor and those who are affluent, and between our generation and those who will come after us. All life on earth is part of one great interdependent system, which influences and depends on the non-living components of the planet — rocks, soils, water and air. Disturbing one part of this

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biosphere can affect the whole. Just as human societies are interdependent and future generations are affected by our present actions, so the world of nature is increasingly dominated by our behaviour. It is a matter of ethics as well as practicality to manage development so that it does not threaten the survival of other species or eliminate their habitats. While our survival depends on the use of other species, we need not and should not use them cruelly or wastefully.

The real aim of development is to improve the quality of human life. It is a process that enables human beings to realize their potential, build self-confidence and lead lives of dignity and fulfilment. Economic growth is an important component of development, but it cannot be a goal in itself, nor can it go on indefinitely. Although people differ in the goals that they would set for development, some are virtually universal. These include a long and healthy life, education, access to the resources needed for a decent standard of living, political freedom, guaranteed human rights and freedom from violence. Development is real only if it makes our lives better in all these respects.

Each and every meaning of community is important in our quest for sustainability because it is in our interactions with our communities that we will be most effective in our efforts to protect the Earth. Most of the creative and productive activities of individuals or groups take place in communities. Communities and citizens’ groups provide the most readily accessible means for people to take socially valuable action as well as to express their concerns. Properly mandated, empowered and informed, communities can contribute to decisions that affect them and play an indispensable part in creating a securely-based sustainable society.

Working from the perspective of community is important because there is a lot that can be accomplished by a group of people who feel a certain degree of association with or responsibility for other members of their community. This concept is especially important when we take that sense of association and responsibility and extend it from the smallest form of community out to the largest. In this way, an individual may feel a certain sense of association with his particular club, which is a small community, then a sense of belonging at the work place or to his professional colleges, an even greater sense of ties to his neighbourhood, and then to his city and nation. He may feel a sense of belonging to others of his religion or race around the world and consider that his “community”. Ultimately, he may come to regard all his fellow members in the community of humanity as somehow related to him, and from there see all of nature, including the trees, the animals and perhaps even the insects as being part of the same community by virtue of sharing the same air, sun and planet.

Communities residing in different neighbourhoods and villages may have structures and occasions in which they tackle common issues and problems. These structures offer ideal platforms from which great contributions can be made to the environment. Organizing an event or project with one of these groups — with one’s chess club, the people at work or fellow students from school — can yield immediate results in achieving sustainability at a local level.

Ladies and Gentlemen,
We at UNEP strongly support forging links with all sectors of society, as well as sub-regional organizations. By forging partnerships we not only broaden our scope of work, we are able to utilize its expertise to the fullest. As more and more Governments respond and sign international agreements such as the Biodiversity Convention, Governments need to develop strategies to tackle problems at their source. Along with legislation, education and information are being used to encourage environmentally sound behaviour on the part of humankind or what we at UNEP call environmental citizenship.

What is environmental citizenship?

The essence of environmental citizenship is mobilization of civil society, through education in the broadest sense of the world. Public education and information activities are an important instrument for improving general environmental literacy and a means to unleashing the energy and creativity of people in their communities around the world.

The ultimate goal of UNEP’s environmental citizenship programme is behavioural change. We hope to achieve this through an alliance of partners, including consumer organizations, women, youth, indigenous peoples and the media to work towards our common mission. The partnership among government officials in any given country and of officials among the various countries in the region as well as among the international civil servants are essential and fundamental to achieving UNEP’s mission which is to provide leadership and encourage partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations. Thank you.
4. **Closing Remarks by**

Dr. Pisarn Soydhurum  
Deputy Director, IPST

Ladies and Gentlemen,

Many groups of educators have put and/or are putting their efforts to the development in environmental education, population education, and social studies. Some contribute by giving ideas on them while a few are doing something to make the ideas actually implementable. One example of the latter is the development of teaching and learning materials for teachers and students who are the biggest target consumers in the school system. The participants to this workshop will try to develop innovative teaching-learning exemplars. We are confident that the developed materials coming out of this workshop will be highly valuable to schools, not only in the local setting but also in other geographical areas. For those of you who brought some materials, some modifications may be required for wider use, since at least four vital factors have to be considered in the effective implementation of any programme. These are the learners, the teachers, the curriculum, and the physical environment where the learning would take place. The combined effort to repackage selected materials during this workshop will certainly add more value to them as these materials will be utilized as exemplar materials appropriate to schools in the region. The outcome of this workshop will, I am sure, be counted as another substantial contribution to education in this part of the world.

Thank you.
Annex IV

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