

Article

Environmental Education in the Asia-Pacific Region: Some Problems and Prospects*

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This article is the result of the analysis of status reports received from 36 countries in the Asia-Pacific region. It attempts to outline general trends, patterns and problems of environmental education (EE) in the region. The findings indicate that EE is embedded in all forms of education. Initiatives such as “greening” the curricula and teaching composite courses in primary education and integrated courses at the secondary level are becoming common practices. Environmental concerns are incorporated into social science as well as physical science courses. There are many examples of innovation, eco-business, professional development and extracurricular activities. Examples of innovative works of each country and a few service providers are also provided. The lack of national guidelines, institutional coordination and comprehensive governmental commitment are policy-level issues, whereas inadequate manpower, rigid curricula and conventional teaching, poor infrastructure, ambiguity of concepts and unavailability of information are the problems of managing EE programs. The article argues that the countries of the region are aware of, and interested in, EE. Despite their economic hardships, the countries have shown leadership in encouraging EE. Yet EE has not been able to make a quantum leap because of its direct link with poverty, population, environmental degradation and discrimination. The success stories are patchy and isolated, and there is a lack of effort to synergize the activities of service providers. The article emphasizes the need to provide incentives to promote and foster EE in the region.

1. Introduction

The natural resources of the Asia-Pacific region are deteriorating in an alarming way. Consequently, the region is facing daunting problems of environmental degradation. The magnitude and severity of the problems are discussed in the *Proceedings of the First International Workshop for Strategic Research on Global Environment* organized by the IGES in 1997. Taking these problems into account, IGES began to

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undertake strategic research in five research areas, of which the Environmental Education (EE) Project is one, to promote eco-consciousness towards a sustainable future in the region (Moriya 1997). This article attempts to outline trends, patterns, problems and prospects of EE. Data and information from 36 countries provide the basis for this outline.

To present the information in a systematic manner, this article is divided into five parts. Part 1 gives a short overview of the article. Part 2 describes the methodology employed to gather data and information. It also presents a short overview of the setting and the framework under which the analysis was performed. Part 3 outlines the findings, major issues and problems. It also lists innovative EE activities undertaken in the region at the country level. Findings are discussed in Part 4. Part 5 provides conclusions with an emphasis on the need to provide incentives to promote EE in the region.

2. Approach and methodology

With a view towards preparing a comprehensive regional strategy on EE for the Asia-Pacific region, the EE Project conducted a preliminary review of EE activities in the region. This Part briefly summarizes the setting for this study, a description of EE, the methodology and techniques of the study and the framework of analysis adopted by the Project.

The Setting. In order to provide a broad scenario of EE activities, the Project decided to survey as many countries from the region as possible. Forty countries were contacted for this purpose, but only 36 countries (from Mongolia in the North to Tonga in the South, from Kiribati in the East and Pakistan in the West) participated in the study. Their geographical distribution is shown in Table 1. The four countries that were not available for the study were New Zealand, North Korea, the Cook Islands and Tuvalu.

In order to determine how to work closely and collaboratively with the countries in the region, it is necessary to understand the background of this region. For this reason, a brief description of this region is presented below.

The Asia-Pacific region is one of most diverse regions in the world—environmentally, economically and culturally. The Asia-Pacific region is the largest land division in the world and covers about 23% of the world's total land and a vast expanse of the Pacific and the Indian Oceans. The region also contains a diverse range of terrestrial ecosystems, including deserts, rain forests and the largest biologically rich forest cover in the world. Over two-thirds of the world's coral reefs and one-third of the mangrove area are also located in the region.

Table 1. Geographical distribution of countries studied.

Sub-Region	Number	%	Countries
South Asia	7	19	Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Southeast Asia	10	28	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
Northeast Asia	5	14	China, Japan, Mongolia, South Korea, Taiwan
The Pacific	14	39	Australia, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu
Total	36	100	

The region houses 58% of the world's population, and 70% of its population is concentrated in five countries: China, India, Indonesia, Pakistan and Bangladesh. Fifteen of the world's 25 cities that together house over 10 million people are in this region (ADB 1997).

Economically, the Asia-Pacific region is the fastest growing region in the world. The region houses high-income economies such as Japan's, newly industrialized countries (NIEs) and the world's lowest income economies such as Bhutan, Nepal, Bangladesh and Maldives (UN/ESCAP 1995). The region is beset with persistent poverty, growing populations, discrimination and inequity (Abe and Bhandari 1999). There is a great inequality between the rich and the poor; people depend on the natural environment economically and culturally; and the region's economies range from nomadic and subsistence agricultural to intensive commercial and from primitive to industrial.

Sharp extremes in the region include the world's most populous and densely populated countries, land-locked and sea-locked countries and the world's smallest island countries. These island countries are made up of volcanic and oceanic islands and atolls.

The region is also physically diverse. It contains the world's highest mountain, the deepest sea (the deepest trench of about 11 km below sea level is found in the Pacific Ocean), the deepest lake (Baikal), the highest city (Lhasa) and the driest desert (Gobi). Its area ranges from many small, one-island nations to archipelagic countries such as the Philippines and Indonesia. Some countries such as Nepal and Bhutan are mountainous, whereas Tonga has neither a river nor a mountain (Abe and Bhandari 1999).

The Asia-Pacific region houses all the major religions of the world: Hinduism, Buddhism, Christianity and Muslim. Politically, India has the largest democratic system, while China has a policy of "one country with two systems". Some countries attained their independence only in recent years.

Environmental Education. The operational definition adopted in the article is that environmental education is a holistic approach to the learning process, whereby individuals and community acquire the knowledge, attitudes, skills, values and motivation to improve the quality of environment and attain an ecologically and socially sustainable future. Accordingly, "environmental education" in this article refers to: (1) education for a sustainable future, (2) education for the environment and (3) education for sustainability.

Outline preparation. A topical outline of information required for inclusion in the status report was developed by the Project with the goals and objective of the Project in consideration. The outline was then sent to selected experts for their comments and suggestions, which, in turn, were incorporated into the outline. The outline covered six broad areas:

- An overview of national education systems;
- Courses and EE activities in formal education;
- EE in informal as well as non-formal education programs;
- Professional activities (institutions, research works, organization, training and research);
- Ways in which media, NGOs, and business and industry are promoting EE and
- Major problems and prospects of EE.

Selection of collaborators. National collaborators were selected on the basis of lists of names received from UNEP, SPREP, JICA, Griffith University, EE experts and others. The lists were thoroughly reviewed by the Project. Based on their experience, qualifications and nature of work, one or two potential candidates were chosen for each country. In some countries of the Pacific region, agencies responsible for the overall management of environmental education were contacted, and the persons suggested by them were accepted as the IGES collaborators. These candidates were then contacted and briefed about the plan and objectives of the Project. After receiving their consent, the topical outline was forwarded to them for their review and consideration. The collaborators were then asked to assess the situation of EE in their countries as per the outline. To authenticate their commitment, contracts were signed between the IGES and the collaborators.

Techniques of data collection. The collaborators were advised to adopt a process of participatory techniques to collect data and information. They were encouraged to use existing secondary data and information. Some collaborators interviewed experts and educators and carried out wide consultations while preparing their status reports.

Preparation of status reports. The collaborators were given six months to prepare their status reports. Each was required to submit an interim report. The review of the interim report provided an opportunity for the Project as well as the collaborators to review methods of information collection and to determine where it stood in terms of report preparation. This was further enhanced by constant communication.

Framework for analysis. A framework for analysis (Box 1) was employed to review and analyze the status reports. The results of the analysis are summarized (Table 2) and specific EE activities for each country are presented (Table 3).

Box 1. Framework for Analysis.

- (1) What are the general patterns and trends of EE in the region?
- (2) What are the opportunities for students in extracurricular and co-curricular activities?
- (3) Are there any opportunities or incentives for professional development?
- (4) What are the major EE activities at the country level?
- (5) What are the ways and methods that business and industry, NGOs and the media use to promote EE?
- (6) What are the major issues and problems of EE in the region?

3. Results

Using the above-mentioned framework for analysis, the data and information were analyzed. The findings of the analysis are presented below.

3.1. Some exemplary works

The analysis of data and information indicate that quite a number of successful examples related to environmental education exist in the region. Although details have been presented in Table 2 for each country, short glimpses of the successful cases are briefly provided here.

- In Tonga, the Ministry of Education coordinates an extracurricular project called the Plants Project for primary school students. The Project emphasizes plant species that are of cultural and traditional importance to the Kingdom of Tonga.
- The development of close bonds between people and nature can be found in Papua New Guinea. For example, in most places, clans are named after some animal or plant. The clans do not eat or use that particular animal or plant.
- In Kiribati, a customary law bans the catching of particular fish species during certain times or sets aside some areas (called *mo*) where harvesting of resources is reserved strictly for the high chiefs.
- One successful example of EE from China is the Beijing Zoo brown bear project, which was organized around a young brown bear to educate pupils to love animals as friends of human beings. Pupils were asked to provide new names for this bear. Then the Zoo replaced the old board with new names and filled the board full of views of this animal.

China's "Hand in Hand Global Village" Program is another noteworthy example. Its motto is "*Hand in hand to pick up hope, and protect the large Earth by small actions.*" Its targets are both urban and rural children. The program was initiated by Ms. Lu Qin, a volunteer. It began in 1996, when the Yucai Primary School put forward an appeal to the *China Children Newspaper* for children to recycle cans, papers, newspapers, batteries and plastic bags. The proceeds were used to build a "Hand in Hand Environmental Protection Primary School" in a poverty-stricken region of Jiangxi Province. In 1998, the proceeds were used to build another primary school in Anyi County, Jiangxi Province. The "Hand in Hand Global Village Program" is becoming popular in many Chinese primary schools. Every village now has a council hall, an information desk, a recycle station, a radio station and a small bank. Children are responsible for participating in these departments. In this way, children can now be a part of the process of solving community problems.

- In Myanmar, every school student must plant three tree seedlings in the rainy season: the first tree to compensate for previous use, the second one for present use and the third one for use by future generations.
- In Malaysia, the Department of Wildlife and National Parks holds weekend camping and nature education courses for school children on school holidays. Working closely with the Ministry of Education, the Department provides the programs, places, instructors and facilities. The Ministry of Education chooses the schools and students to participate in the program. The purpose of these programs is to educate schoolchildren about the environment and its conservation. Likewise, in Indonesia, the Ministry of Population and Environment and the Ministry of Education and Cul-

ture have jointly established Environmental Study Centres (ESCs) in all state-owned universities. These two Ministries are jointly responsible for the capacity development of the ESC as the University's executive units for implementing the Tridharma missions (i.e., education and training, research and community service in the field of the living environment).

- In Cambodia the government has implemented the school cluster model nationwide. A school cluster is a grouping of 5 to 7 primary schools for administrative and educational purposes. One school in the cluster is selected as a core (or central) school among the groups of schools in the cluster. The model implies decentralization and local participation in decision-making. As a result, the enrollment and the promotion rates are higher, the dropout rates are lower and the teaching quality is better. In addition, the government has formed the Inter-Ministerial Steering Committee for Environmental Education to coordinate environmental education at the national level.
- Every two years, the Korean Ministry of Environment designates Environmental Conservation Model Schools and has operated them with cooperation from regional boards of education nationwide since 1985. The Ministry, in partnership with municipal offices and local offices of education, designates honor schools for environmental education in order to nurture students' values and attitudes toward environmental conservation. These schools facilitate the sharing and disseminating of exemplary teaching modules, establish a sound value system for environment and practice environmental conservation in daily life. These honor schools emphasize the school curricula as well as extracurricular activities.
- In India, the Supreme Court has passed a judgement whereby the University Grants Commission is required to include environmental courses in the universities. Pakistan runs a "Be a Parent" program in its zoo for people to adopt animals.

These examples would provide a role model to other countries to promote environmental education. These initiatives should be continued, strengthened and valorized for the benefit of human beings.

3.2. General trends and patterns

The general trends and patterns of EE are briefly summarized below.

a. Incorporation of EE into all forms of education

EE is found in all forms of education (formal, non-formal and informal education) in the region. The responsibility of managing EE falls under the jurisdiction of the Ministries of Education in some countries and under the Ministries of Environment or other ministries in other countries. The major initiatives of EE are coming from ministries other than the Ministries of Education. In-service and pre-service training programs are provided to teachers and other facilitators. Teaching materials have been developed locally and disseminated. Also, a variety of innovative methods of teaching and learning are being practiced.

b. Progression towards greener curricula

Cross-curriculum approaches have been adopted to integrate environmental themes into curricula. In this approach, the whole curriculum is reviewed and environmental concerns are incorporated into all subjects, not just one particular subject. Some countries have begun to “green” their curricula by incorporating environmental concerns and have emphasized the use of local resources in teaching and learning processes. This involves the integration of environmental principles, problems and solutions into other disciplines. Both the natural environment and the man-made environment are involved.

c. Creation of new initiatives

Some of the innovative works being done in the region include new initiatives such as the designation of model schools and honor schools, the development of optional courses, establishment of Teacher’s Centers for Excellence and awards, Supreme Court orders to include EE in universities and collaboration between ministries and state universities for education, training and research. Other initiatives include the creation of a green bank, an eco-polis center (a place for environmental information, education and hands-on activities in the community), a green press (collecting and publishing news related to environment), eco-clubs, eco-farming and eco-harvesting. In some countries, special economic incentives such as subsidies and tax-exemptions are also provided to schools that offer EE courses. In Indonesia, green banking programs have been initiated to provide insurance against environmental degradation. In these programs, the area to be used as collateral for credit requests for industrial zone development should be under environmental insurance for its future risks and impacts that might come from its industrial activities.

d. Perception of EE as a new approach to education

EE is seen as an integrated approach to education. While some countries see it as values education (concerning respect for nature and life, stewardship over natural resources, simple living, personal responsibility and gratitude for the lavish gifts of nature), others think that it provides a new perspective on education (concerning education in, about and for the environment). All these suggest that environmental education should not be an independent subject in its own right. Rather, it is a holistic approach to education that takes into consideration the environment that surrounds and affects people.

e. Development of composite courses at the primary level

Composite courses such as *Environmental Studies*, *The Environment Around Us*, *The World Around Us*, *Environmental Science*, *Man and the Environment*, *Nature Science* and *Life Experiences* have been adopted at the primary level, and environmental themes are either integrated into existing subjects or are developed as compulsory courses at the secondary level. Some countries have introduced environmental courses as optional courses at the secondary school. Separate degree courses are offered at the tertiary level.

f. Movement of focus from physical science to social science courses

The trend shows that there has been a shift from incorporating environmental matters only in physical science courses towards including environmental matters in social science, liberal arts and humanities

courses as well. In addition to physical science courses, environmental concerns can now be found in courses such as in *Moral Education, Hygiene, Religion and Civic Education*. Nevertheless, environmental themes have been dominant in the physical science courses only.

However, environmental issues do not exist solely within physical contexts. For example, the Asiatic wild water buffalo is on the verge of extinction and is found only in the eastern part of Nepal. In order to understand fully its status, we must analyze the current social situation as well as the physical situation. An understanding of the destruction of the buffalo's habitat is possible only by understanding the social science aspects of the situation—for example, the norms and values of the people destroying their habitats, the dynamics of human actions, population pressure, poverty and socio-economic conditions.

g. Emphasis on formal education

Some countries have placed more emphasis on formal education because they envision that children will help educate their parents and can more easily influence their parents' actions. In turn, these parents will have a greater impact on environmental resources. This approach has been quite successful in some Pacific countries. However, there is less emphasis on non-formal education. In order to make environmental education successful, all types of education, both formal and non-formal, should be utilized.

h. Establishment of successful eco-business activities

Exemplary works such as the green bank, eco-labeling, eco-consumerism, environmental advocacy and green press are becoming popular. These activities have been successful in enhancing environmental education in the region. Green banking, discussed earlier, has created public incentives for environmental insurance. Likewise, in many industrialized countries, eco-marks are changing people's attitudes toward products that are not environmentally friendly.

3.3. Extra- and co-curricular activities

In addition to conventional ways of conducting theoretical and practical classes, various innovative ways are undertaken to provide opportunities for students to acquire knowledge, attitudes and skills in school as well as out of school. The opportunities include eco-clubs, green clubs, nature clubs, camp and outdoor education, intra-mural competition, project work, street theatre, internships, mock congresses and junior eco-clubs. These activities provide students with out-of-classroom opportunities to relate their knowledge to practice; obtain direct, first-hand experiences with the local environment and apply what they have learned in the classroom to real-life situations. The integration of theory into practice has had a great impact on the environmental activities of society.

3.4. Professional development

Numerous attempts have been made to improve EE in the region. These attempts include holding pre-service, in-service, on-the-job and professional programs and forming of environmental educator associations as forums for environmental educators to share and exchange their knowledge, expertise and experiences. Likewise, funds for conducting research, scholarship grants for professional development and networks for education have helped foster environmental education in the region.

3.5. Innovative activities at the country level

Innovative EE activities undertaken in the countries of the region are briefly presented in Table 2. The countries are arranged in alphabetical order according to sub-region.

Table 2. Innovative EE activities in the region, organized by country.

Country	Responsible organization(s)	Innovative Practices
1. Bangladesh	Ministry of Education; Ministry of Environment and Forests	<ul style="list-style-type: none"> ■ Grades 3 to 5 have courses in <i>Environmental Studies</i> (Society) and <i>Environmental Studies</i> (Science). Teachers' guides have been developed for these courses. ■ The National Environment Policy and National Plans have emphasized the importance of EE. ■ Environmental themes are infused in Grades 1 and 2 and are integrated in Grades 3 to 8. Separate courses have been developed at the tertiary level. ■ Universities offer courses such as <i>Zoology</i>, <i>Botany</i> and <i>Geography</i> with environmental themes. ■ 400 science clubs have been established in schools across the country.
2. Bhutan	Ministry of Health and Education; National Environment Commission	<ul style="list-style-type: none"> ■ Bhutan has developed a new approach to its primary education curriculum (up to Grade 3). This approach is called EVS (Environmental Studies) and emphasizes conservation and sustainable uses. In view of the considerable success in pupils' achievement levels, EVS has been extended to other levels. ■ New courses such as <i>Physical Education</i>, <i>Health</i> and <i>Creative Arts</i> also include environmental themes. ■ Nature Group Centers (<i>Singye Karm</i>) have been established to educate local villagers.
3. India	Ministry of Human Resource Development; Ministry of Environment and Forests	<ul style="list-style-type: none"> ■ The National Conservation Strategy and Policy Statement has emphasized the importance of EE. ■ A Supreme Court order has required the University Grants Commission to prescribe courses on the environment in higher education. ■ A composite course is given to Grades 1 to 2 and <i>Environmental Studies-I</i> (Social Science) and <i>Environmental Studies-II</i> (Science) courses are taught in Grades 3 to 5. ■ Grades 1 to 5 emphasize learning in, about and for the environment. ■ A 9-month professional training course on EE is provided to post-graduate students. ■ The <i>Prayavaran Vahini</i> Scheme is underway to create environmental awareness. ■ In-service and pre-service training are provided to teachers and civil servants. ■ The ENVIS (Environmental Information System) has been established to collect, retrieve and disseminate environmental information. ■ A National Environmental Awareness Campaign (NEAC) has been initiated for public awareness. ■ Some 3500 eco-clubs are actively run across the country for Grades 6 to 10.
4. Maldives	Ministry of Education; Ministry of Home Affairs, Housing and Environment	<ul style="list-style-type: none"> ■ The 2nd National Environment Action Plan emphasizes environmental awareness. ■ A President's Environmental Award Scheme has been established for schools. ■ Grades 1 to 5 have <i>Environmental Studies</i> courses with teacher's guides and reference materials. ■ Grades 8 to 10 have a <i>Fisheries Science</i> course. ■ Environmental clubs are active in schools.
5. Nepal	Ministry of Education; Ministry of Population and Environment; Environment Protection Council	<ul style="list-style-type: none"> ■ The National Conservation Strategy and the 9th Five Year Plan emphasize environment and EE. ■ Grades 1 to 3 have an <i>Environment Around Me</i> course; Grades 4 to 5 have <i>Environmental Science and Health Education</i>; Grades 6 to 8 have <i>Population and Environmental Education</i>; Grades 9 and 10 have <i>Health, Population and Environmental Science</i> and Grade 12 has <i>Environmental Education</i>. ■ An EE course for a bachelor's degree program in education has been developed. ■ Popular extracurricular activities include field trips, school visits, outdoor camps, competition and contests, and project work.

6. Pakistan	Federal Ministry of Education; Pakistan Environment Council; Federal Ministry of Environment	<ul style="list-style-type: none"> ■ Pakistan has an Environmental Strategy and Education Sub-strategy for the Balochistan and Sindh provinces. ■ Strategies have been developed for Mass Environmental Awareness and Education. ■ The country has launched the Coordinated Environmental Education Project (CEEP) for training teachers and decision-makers. ■ A course outline and teachers' manual have been developed for <i>Environmental Studies</i> as an optional secondary school course. ■ The Karachi Institute of Environmental Studies offers an EE course in its master's degree program. ■ The proposal of establishing a Teacher's Center for Excellence in EE in Islamabad has been approved. ■ A prototype curriculum and teachers' manual for pre-service training programs have been developed. ■ Several in-service EE training courses for governmental officials are organized. ■ Special programs are run to "green" opinion leaders and religious leaders. ■ The DEEP (Daudpota Environmental Education Program) Prize for outstanding work in EE has been established. ■ A 16-week training course spread over a period of two years is run for government, NGO, business and military personnel under the LEAD (Leadership for Environment and Development) Program. ■ Several hundred environmental clubs (nature clubs) have been established in schools nationwide.
7. Sri Lanka	Ministry of Education and Higher Education	<ul style="list-style-type: none"> ■ A course <i>Environmental Studies</i> is offered at the primary level; <i>Science, Social Studies and Health</i> at the secondary level and <i>Zoology, Botany and Geography</i> at the senior secondary level. ■ Environmental themes are incorporated into the bachelor's degree courses such as <i>Zoology and Botany</i>. ■ Environmental modules are found in education programs for teachers. ■ The National Education Commission requires schools to contribute to "the evolution of a sustainable pattern of living". ■ Environmental topics have been integrated into primary and secondary curricula since the 1970s. ■ Environmental Pioneer Brigades and Environmental Clubs have been established in schools. ■ Field Study Centers have been established.
8. Brunei Darussalam	Ministry of Education	<ul style="list-style-type: none"> ■ Brunei Darussalam has drafted a plan for EE. ■ An agency named Collaboration of Action Research in Education (CARE) conducts research on EE. ■ Environmental themes are infused in <i>Science, Geography and Civics</i> classes. ■ A Field Studies Center has been established for students. ■ The Ministry organizes the Annual Science Week, Environmental Camp for scouts and the Green Environment Project for school children and school clubs.
9. Cambodia	Ministry of Education; Youth and Sports (MEYS); IMSCEE (Inter-Ministerial Steering Committee for Environmental Education); Ministry of Cults and Religion	<ul style="list-style-type: none"> ■ EE has been integrated into primary and secondary schools and monk school. ■ A teacher's guide and booklets are developed in Khmer for the primary level. ■ A teacher's manual is under preparation for the secondary level. ■ A series of workshops has been organized for primary teachers. ■ EE has been included in formal as well as in non-formal monk education. ■ Monks are active in running community-based environmental training programs.
10. Indonesia	Ministry of Education and Culture (MOEC); Ministry of Religious Affairs; Ministry of Population and Environment	<ul style="list-style-type: none"> ■ Environmental Study Centers have been established at all state universities for education and training, research and community services. ■ A program for greening the curriculum has been initiated. ■ At the primary school level, environmental themes are included in <i>Biology, Physics, Chemistry, Anthropology, History, Geography, Health, Civics (Basic Ideology), Religion, Natural Science and Sports</i>. ■ At the secondary level, environmental themes are integrated in <i>Biology, Physics, Social Science, Language and Theory</i>. There are some intra-curricular activities as well. ■ Monolithic subjects such as <i>Basic Environmental Science, Environmental Planning and Environmental Protection</i> are also offered. ■ Non-formal EE efforts include the Clean River Program, the Blue Sky Program, the One-Million Tree Movement, the Clean City Campaign and the Zoological Garden. ■ Outdoor education on Saturdays, environmental sports activities and environmental services for school children are carried out.

11. Lao PDR	Ministry of Education	<ul style="list-style-type: none"> ■ In Grades 4 to 6, <i>The World Around Us</i> is taught. ■ A teacher's manual for Grades 1 to 3 has been prepared. ■ In lower secondary level, environmental concerns are incorporated into the subjects of natural science. The fifth year focuses on the ecological system. The Year Two Module focuses on animals and their conservation. ■ A handbook, the <i>Environmental Management Manual</i>, has been developed. ■ The Department of Non-Formal Education runs community centers to provide adult education and literacy. It also offers a class on Environmental Protection (equivalent to Grade 3 level) and has 4,700 mobile libraries. ■ Exhibitions and nature clubs have been initiated to prepare volunteers in environmental planning and conservation. ■ National Environmental Training Center provides training to youths.
12. Malaysia	Ministry of Education	<ul style="list-style-type: none"> ■ The concept of environment has been included in the National Education Policy. ■ In Grade 4, <i>Man and the Environment</i> is offered and environmental themes are incorporated in <i>Social Science</i>, <i>Health Education</i>, <i>Civics</i>, <i>History</i> and <i>Geography</i>. ■ At the secondary level, <i>Biology</i>, <i>Chemistry</i>, <i>Physics</i> and other courses include environmental themes. ■ The Faculty of Education offers courses and training on EE. ■ Competitions such as nature science quizzes, essays and natural science camps; environmental weeks; "schools in the garden" and EE projects are organized. Recreational environmental projects and debates are also organized. ■ The Department of Environment organizes environmental awareness camps for schools. ■ Environmental Education Clubs offer a one credit hour compulsory course to the students of the Diploma of Education.
13. Myanmar	Ministry of Education; Ministry of Forestry; National Commission for Environmental Affairs	<ul style="list-style-type: none"> ■ Informal EE is part of the Buddhist culture of Myanmar. ■ The National Environment Policy (1994) and Myanmar Forest Policy (1998) deal with public awareness, community participation and development. ■ In primary schools, nature and environment are taught in <i>Science</i>, <i>Earth Science</i> (social studies) and <i>Language</i> (poetry, stories, songs, landslides, water cycle and natural environment). ■ The Ministry of Forestry provides training for primary and secondary school-teachers and governmental officers on conservation education. ■ The Myanmar Education Research Bureau conducts research on education and innovative strategies. ■ Awareness materials such as posters and pamphlets have been published. ■ Students are involved in greening non-forested areas and planting three trees in a year (one as compensation for previous use, the second for present use and the third for use by future generations).
14. Philippines	Department of Education, Sports and Culture (DESC); Environmental Management Board (EMB); Commission on Higher Education; and Technical Education and Skill Development Authority	<ul style="list-style-type: none"> ■ Environmental concepts and skills are integrated into National Minimum Learning Competencies for elementary schools and the Desired Learning Competencies for secondary schools. ■ In basic education, EE is integrated into <i>Science</i>, <i>Social Studies</i> and <i>Home Technology</i>. ■ All public elementary and secondary schools have "clean and green" and "war on waste" projects and recycling programs. They must also have an exhibit room for display of items made from recycled products. ■ The Department of Environment and Natural Resources (DENR) has formulated the National Strategy for Environmental Education. ■ The Environmental Management Board recognizes the cleanest, most environmentally sound schools. ■ The Department of Education, Sports and Culture has scholarships for elementary teachers to major in EE. ■ Universities offer degree courses in EE as inter-departmental and inter-college courses. ■ The College of Education (Diliman) offers a Master of Arts degree in EE. ■ A network of PATLEPALM (The Philippine Association of Tertiary Level Education Institutions in Environmental Protection and Management) is active in the Philippines. ■ Pedagogy includes a community-based approach, use of "real-life situations", issue-based approaches, case studies and fieldwork. ■ Competitions and contests are organized for students.

15. Singapore	Ministry of Education	<ul style="list-style-type: none"> ■ The “Keep Singapore Clean” Campaign is the first effort to encourage environmental consciousness and make Singapore a Model Environmental City by 2000. ■ A “Singapore Green Plan” contains a major thrust on EE. ■ Environmental themes are integrated in <i>Science, Health Education and Social Studies</i> in primary school, and <i>Biology, Chemistry, Geography and Health Education</i> in secondary school. ■ Some 15 GOs and NGOs are involved in promoting environmental awareness and action nationwide. ■ The Ministry has established an Environmental Resource Center. ■ Clean and Green Week and Clean River Campaigns are successful. Girl Scouts and Boy Scouts must plant a second tree. Also, students run projects such as growing pesticide-free vegetables, beautifying school yards and operating mini-companies (or cooperatives) to produce vegetables.
16. Thailand	Ministry of Education (primary and secondary); Office of the Prime Minister (special education); Ministry of University Affairs; Ministry of Interior (Education in hinterland); Office of the National Education Commission	<ul style="list-style-type: none"> ■ The Ministry of Education has launched the Master Plan for Environmental Education. ■ The concept of cross-curriculum has been emphasized. The <i>Life Experience</i> course integrates <i>Science, Social Studies, Health</i> and <i>Moral Education</i>. ■ Grades 1 to 3 learn to care for houseplants and pets at home and school. Grades 3 to 6 learn the relationships among human beings, animals and plants. ■ In the lower secondary level, environmental issues are integrated in <i>Environmental Science and Social Studies</i>. Also, <i>Social Studies</i> (community development activities) is offered as an elective course that focuses on local environmental problems. In the upper secondary level, environmental themes are integrated into <i>Thai Literature and Culture, Biology, Chemistry and Technology</i>. ■ Universities and Rajaphat Institutes (former Teacher Training Institutes) offer EE as a major course. The Rajaphat Institute (Pranakorn) offers a master’s degree in EE. The Environmental Education Center has been established to provide training in EE for teachers. ■ The Teacher Education Institute provides training to teachers in kindergarten, elementary and secondary schools. ■ Universities offer master’s and doctoral degree courses in EE. Chulalongkorn University is working to produce a prototype EE package for teachers. ■ Environmental parks and community resource centers are being planned in each village to promote EE. ■ Speech competitions and project work at the upper secondary school; three-day field trips (creative field trips with discussion and a workshop) and students’ involvement in environmental awareness campaigns are common extracurricular activities.
17. Vietnam	Ministry of Education and Training	<ul style="list-style-type: none"> ■ EE is emphasized in the 1991 National Plan on Environment and Sustainable Development. ■ In primary school, environmental themes are integrated in <i>Nature, Social Studies, Literature, Moral Education</i> and <i>Health Education</i>. ■ In secondary school, environmental themes are included in <i>Biology, Geography, Civics, Agro-technics, Literature, Mathematics, Physics</i> and <i>Chemistry</i>. ■ Teaching materials have been developed for primary and secondary schools. ■ Vietnam subscribes to the “Learning for a Sustainable Environment” Project for EE teachers. ■ Several Teacher Training Colleges have developed a compulsory 30-hour special course <i>Chemistry and Environment</i> for the chemistry faculty; a 30-hour special course on EE for kindergarten and primary education teachers; and 20-hour <i>Man and the Environment</i> and 10-hour <i>Environment</i> courses for all faculty. ■ Hanoi Pedagogical University has a master’s degree program on <i>Population and Environmental Education</i>. Universities have started post-graduate and Ph.D. degree programs in EE. ■ Field work, national festivals of growing plants, the garden-pool-stable (VAC) program and garden-pool-stable-forest (VACR) programs are common. Intra-mural, inter-school and inter-provincial school competitions are also organized.
18. China	National Education Commission	<ul style="list-style-type: none"> ■ <i>China Agenda 21</i> is an official policy of China on the environment. ■ China has issued the “National Action Program for Publicity and Education (1996-2000)” and developed EE as an aspect of literacy and provides training to school teachers, administrators and leaders. ■ Pre-service training on ISO 14000 is provided. ■ Six series of Teacher Training Guides, Teacher’s Manuals and books on EE have been published. ■ Over 250 colleges and institutes offer courses on EE for professionals, and <i>Environmental Studies</i> is offered as an elective for non-professionals. ■ Three EE Teacher Training Centers have been established in Beijing, Shanghai and Choqing.

		<ul style="list-style-type: none"> ■ Chaozhou City was named by UNEP as one of the “500 Best Cities in the World” for its achievements in EE where 200,000 students in over 1,000 schools participated in EE programs through both in and out of school activities. ■ Biological, geological and environment protection groups are also active in schools.
19. Japan	Ministry of Education, Science and Sports (MESS); Environment Agency of Japan	<ul style="list-style-type: none"> ■ MESS believes that if the content of the course of study is put into practice with sincerity, the purpose of EE is achieved. The Ministry has put more emphasis on the development of teaching materials, especially for the local environment, with a full range of EE approaches. ■ The Environment Agency of Japan has formed an Environmental Education Committee. ■ The Teacher’s Union has voluntarily integrated environmental concerns into the curriculum. ■ Private educational groups have incorporated topics of “green” and “brown” sectors into their courses of study and prepared three volumes of EE guidance materials for elementary, junior high and high schools. ■ A 100-school Project on waste disposal links many schools with computer networks. ■ A course <i>Life Environmental Studies</i> is taught in Grades 1 to 2. ■ Graduate courses such as <i>Environment, Ecology and Principles of EE</i> are offered in many universities. ■ Evening classes and seminar courses are held for teachers of EE. ■ Cooperative education projects such as environmental internships are undertaken in tertiary education. ■ The newsletter <i>Environmental Education</i> is published biannually. ■ <i>Social Education</i> in public schools is common to supplement EE. It is in accordance with “<i>Study Rights for All People</i>”. ■ A <i>Period of Integrated Study</i> has been proposed to incorporate environmental concerns. This is a cross-curriculum approach in structuring the curriculum. ■ Project works and environmental fairs are organized. ■ The Japanese government has subscribed to GLOBE(Global Learning and Observation to Benefit Environment), and EIL Net(Environmental Investigation and Learning Network) has been established. This network consists of five special elements: soundscape, heat island, acid rain, river front and dandelion (a plant) and food culture. ■ A Junior Eco-Club has been established. The Club supports a group of 20 students, conducts national exchange programs and publishes a bi-monthly newsletter.
20. Mongolia	Ministry of Enlightenment; Ministry of Nature and Environment; Ministry of Science and Technology	<ul style="list-style-type: none"> ■ Mongolia has developed a Non-formal Education (NFE) National Development Program under the NFE Center and conducts EE and distance learning mode of education for citizens. ■ EE is a part of the elementary and secondary program and is taught in <i>Natural Science, Biology, Geology and Geography</i>. ■ Mongolia has a strategy plan of “Ecological Education for Everyone”. ■ In higher education, courses such as <i>Ecology, Forest Ecology, Ecological Management, Ecotourism, Chemistry and Environmental Engineering</i> are offered. ■ Master’s and Ph.D. degree programs in environmental science are offered.
21. South Korea	Ministry of Education; Ministry of Environment	<ul style="list-style-type: none"> ■ Environmental themes have been integrated into <i>Science</i> and <i>Social Science</i>. ■ 8 Environmental Conservation Model Schools are designated every two years to provide good examples of EE. ■ The Ministry of Education designates honor schools for EE to nurture students’ values and attitudes toward environmental conservation. ■ The government has promulgated the <i>National Statement for Environment Conservation</i>. ■ Environment became an independent subject of 34 semester hours in Grades 1 to 3 and 17 hours in Grades 4 to 6. For Grades 3 to 6, environmental issues are integrated into <i>Moral Education, Social Studies</i> and <i>Nature Science</i>. In high schools, an <i>Ecosystem and Environment</i> course is taught as an elective. ■ There is an increasing tendency to offer EE as a single subject in middle and high schools. ■ The Department of Environmental Education was established under the Ministry of Environment in 1997. ■ Consumer-centered EE programs are being run. ■ South Korea has initiated a “Comprehensive Project for EE Promotion”. This project has 20 programs, of which 8 are related to EE for schools, 7 are related to EE for the public and 5 are to promote environmental information and awareness. ■ South Korea has a provision to train soldiers and veterans in EE.

		<ul style="list-style-type: none"> ■ The College of Education provides in-service training to teachers. Also, teachers are encouraged to take special training courses on EE during their vacations to become qualified EE teachers. ■ Four universities have Departments of EE offering core subjects and electives of 150 credit hours. ■ A Research Association of Environment Teachers has been formed. ■ The Green Family Movement Corps (or Green Boys Clubs), Green Korea, Teenager's Movement for EE and others, Nature Conservation Clubs, Environment Investigation Clubs and contests are common informal modes of education for students.
22. Taiwan	Ministry of Education	<ul style="list-style-type: none"> ■ The Environmental Protection Committee has established an Environmental Education Committee. ■ National Taiwan Normal University has established 12 Environmental Education Centers and publishes a quarterly magazine, <i>Environmental Education</i>. ■ An Environmental Education Society has been established. ■ Taiwan has two graduate schools of EE, one at National Normal University and the other at National Taichung Teacher College. ■ The Ministry of Education runs the Green Program. In this program, a school-based education project covers the whole watershed area. Teachers are given a set of water monitoring kits and textbooks. The Project has been successful in motivating teachers. ■ The Roots and Shoots Center also has been established for elementary, junior high and high schools to educate people about the necessity of EE.
23. Australia	Department of Education, Training and Youth Affairs; Department of the Environment and Heritage; Federal/state/territory governments	<ul style="list-style-type: none"> ■ Australia has a tradition of school-based curriculum development within the broad framework of syllabi, which encourages local innovation and across-the-curriculum support for EE. ■ Australia has a series of state policies and curriculum guidelines and support materials for EE. ■ Australia is committed to building capacity among community groups to develop their own solutions to environmental problems. ■ The Federal Government has published a discussion paper, <i>Today Shapes Tomorrow</i>, and has recognized the importance of EE by encouraging integration and coordination of EE activities and improving their effectiveness. ■ An Environmental Education Database has been established. Airwatch and Waterwatch programs are common.
24. Fiji	Ministry of Education	<ul style="list-style-type: none"> ■ Environmental mini-lessons have been prepared for use in primary and secondary schools. ■ Fiji has developed a <i>Basic Science Handbook</i> incorporating environmental themes. ■ Environmental issues are infused across the curriculum at primary and secondary levels. Grades 1 to 6 have <i>Elementary Science</i>; Grades 1 to 4 have <i>Basic Science</i> and Grades 5 to 7 have <i>Biology, Physics, Geography, Economics</i> and <i>Accounting</i>. ■ Year 8 students take the Health Education Examination, where 20% of marks are allotted to EE. ■ Many primary schools have opted for environmental themes in the UN Project called the Associated School Project (ASP). ■ Sectoral (line) ministries have begun to educate and train people on environmental protection and management. ■ The University of the South Pacific (USP) and other institutes offer courses and provide training for primary and secondary school teachers. ■ Scholarships and funds are available to carry out research and community education. ■ Environmental clubs, outdoor activities, school-based projects and camps have also been established.
25. Kiribati	Ministry of Education and Technology (METT)	<ul style="list-style-type: none"> ■ Primary education has an <i>Environmental Science</i> course; the Grade 4 <i>Social Studies</i> class has geography and environmental content. ■ Grades 8 and 9 have <i>Environmental Science</i> courses as well as the Teacher's Guides. ■ In junior secondary school (Forms 1 to 3), <i>Social Studies</i> and <i>Science</i> have environmental topics; senior secondary school has environmental contents in <i>Biology, Physics</i> and <i>Chemistry</i> courses. ■ At the tertiary level, the Kiribati Teacher College offers pre-service training for primary and junior secondary teachers. Colleges offer <i>Environmental Science</i> courses, and students are required to do research on the environment. ■ Non-formal education activities include action research and community education workshops. ■ The University of South Pacific (USP) Kiribati offers EE courses as core subjects and minors. Optional courses include <i>Human Geography, Biogeography, Microeconomics</i> and <i>Resource Conservation and Management</i>.

26. Marshall Islands	Ministry of Education; Republic of Marshall Islands Environmental Protection Authority (RMIEPA)	<ul style="list-style-type: none"> ■ Environmental issues are integrated into the curriculum, and an EE Teachers Manual has been developed. ■ The Ministry of Education carries out training for elementary and high school teachers on EE. ■ A weekly radio program on the environment is run by the RMIEPA. ■ School visits are conducted by the PYOCR (Pacific Year of Coral Reef) Committee and RMIEPA. ■ The College of Marshall Islands offers courses related to the environment. ■ Workshops are conducted for traditional leaders. ■ The Pacific Islands Climatic Change Assistance Project (PICCAP) and the <i>El Niño</i> Task Force have carried out various environmental awareness programs.
27. Micronesia	Department of Education; Environmental Protection Agency (EPA)	<ul style="list-style-type: none"> ■ The State EE Specialist of the Environmental Protection Agency is responsible for implementing EE awareness activities and conducting research. ■ Secondary schools and the College of Micronesia offer <i>Geography</i> and <i>Earth Science</i>. ■ Awareness materials have been developed and curriculum development workshops on EE have been organized. ■ Hawaii Nature Series and Morriweather EE Booklets are distributed to primary and secondary school students. ■ Students are encouraged to take part in physical education and project works.
28. Nauru	Department of Education; Department of Island Development and Industry	<ul style="list-style-type: none"> ■ EE is not a subject of its own, but is integrated at all levels of the science and social science curriculum. ■ In primary schools, earth science is included in the <i>Science</i> course, and <i>Resource Conservation</i> is taught in Grade 5. ■ <i>Environmental Science</i> is offered in the secondary schools. The <i>Science</i> course includes environmental topics. ■ Nauru has conducted an intensive health campaign on the environment. ■ Competitions, exhibitions and contests are organized for schoolchildren.
29. New Caledonia	Not available	<ul style="list-style-type: none"> ■ EE is integrated into subjects such as <i>Biology</i>, <i>Geography</i> and <i>Civics</i>. Teachers are free to address environmental issues in the classroom. ■ <i>Biology</i> in secondary education has environmental topics, and teachers adopt a holistic approach towards teaching. ■ New Caledonia has produced <i>Fiches Nature</i> (nature file), which contains a number of local plants and animal species. ■ Field trips, nature hikes and forest fire campaigns are commonly organized.
30. Niue	Department of Education; Department of Community Affairs	<ul style="list-style-type: none"> ■ Niue organizes seminars, talks and study tours to conservation areas. ■ Resource materials on EE have been developed. ■ The Niue Primary School has a conservation awareness program. ■ Niue maintains a Database on Environment. ■ Field trips, Niue Environmental Week Camps and study tours of the Boys and Girls Brigades are organized.
31. Palau	Ministry of Education; Palau Environmental Quality Protection Board (EQPB)	<ul style="list-style-type: none"> ■ Courses such as <i>Science</i>, <i>Social Studies</i> and <i>Health</i> address environmental conservation and education. ■ Palau publishes a quarterly newsletter covering environmental topics. ■ Painting of billboards, recycling and bicycle repair programs are common in promoting conservation and literacy. ■ A Mock Congress for the high school is organized annually.
32. Papua New Guinea	National Department of Education; Department of Environment and Conservation	<ul style="list-style-type: none"> ■ Papua New Guinea has formulated National Sustainable Development Strategies. ■ Grades 3 to 5 are offered <i>Environmental Studies</i>, and sustainable teaching/learning modules are issued to all primary teachers. ■ In high school, environmental themes are integrated. Workshops for head teachers and deputy head teachers are also organized. ■ Environmental themes are integrated in <i>Biology</i> at colleges, and the University of Papua New Guinea has a bachelor's degree course in <i>Environmental Science</i>. ■ Competitions, project work for students and teachers, minimizing use of chemicals in gardening and planting are organized.

33. Samoa	Ministry of Education; Ministry of Lands, Survey and Environment	<ul style="list-style-type: none"> ■ EE is integrated into the existing courses of <i>Social Science</i> and <i>Environmental Science</i> at the secondary level, and into <i>Geography</i>, <i>Biology</i> and <i>Ecology</i> in senior college. ■ Samoa has prepared a draft EE curriculum for primary and secondary schools. ■ The Faculty of Education of the University of South Pacific (USP) offers courses on <i>Environment</i> and <i>Environmental Studies</i>. ■ Training is organized for teachers on EE. ■ Samoa has a library assessment project and a library database on EE. ■ Awareness materials and environmental videos are produced for schools. ■ Field trips to conservation areas, intra-mural competitions and some creative science projects are organized. Also, government officials conduct excursions for students to conservation areas.
34. Solomon Islands	Ministry of Education; Ministry of Forests, Environment and Conservation (MOFEC)	<ul style="list-style-type: none"> ■ The Ministry of Education and Ministry of Forests, Environment and Conservation jointly conducted environmental awareness activities at the provincial and district levels to develop a curriculum for religious seminaries and the training of trainers. ■ EE activities have involved leaders (traditional and elected), members of religious organizations and NGOs. ■ In primary education, environmental topics have been incorporated in <i>Social Studies</i>, <i>Health Science</i> and <i>Agriculture</i> classes. ■ In secondary school, environmental topics are included in <i>Science</i> and <i>Social Studies</i> classes. In <i>Science</i>, a students' handbook and teachers' manual have also been developed. ■ The Solomon Islands College offers short courses on EE for government workers. ■ The University of South Pacific (USP) has established an Environmental Education and Information Center in Solomon Islands.
35. Tonga	Ministry of Education; Ministry of Lands, Survey and Natural Resources	<ul style="list-style-type: none"> ■ The Environmental Planning and Conservation Section (EPCS) coordinates mass campaigns through radio, TV announcements, community workshops and public talks. ■ In primary and secondary education, <i>Environmental Science</i> is taught. ■ In Forms 1 to 5, environmental themes and contents are sequenced. <i>Geography</i> is offered as an optional course in Forms 3 to 5. ■ In Forms 6 to 7, environmental themes are incorporated in <i>Geography</i>, <i>Biology</i>, <i>Physics</i> and <i>Chemistry</i>. ■ There are environmental teachers' associations such as the Geography Teachers' Association and the Science Teachers' Association. ■ NFE is carried out through local media. ■ <i>Geography</i> and <i>Science</i> courses involve compulsory fieldwork. ■ Students are involved in Girl Guides and Scouts. ■ Various contests and competitions are organized to promote EE. ■ A project called <i>Plant Project</i> is carried out to plant saplings of economic and cultural importance.
36. Vanuatu	Ministry of Education	<ul style="list-style-type: none"> ■ <i>Environmental Studies</i> in primary education and <i>Social Science</i> in secondary education are offered. ■ The EE course has been revised and teaching materials (teachers' guides, supplementary materials and training packages for professionals) have been prepared. ■ The University of South Pacific (USP) Extension Center, Elamus Campus, offers environmental courses such as <i>Education and Society</i>, <i>Physical Geography</i>, <i>Human Geography</i>, <i>Human Ecology</i>, <i>Earth Science</i> and <i>Biogeography</i>. The Campus is also offering training to teachers and other professionals. ■ Clean Campaign, Rural Road Maintenance, Tree Planting, Nature Clubs, Small Bag Theatre and various contests and competitions are also organized.

3.5. **Business and industry, NGOs and the media in promoting EE**

The innovative EE activities undertaken by business and industry (B&I), NGOs and the media in the Asia-Pacific region are briefly summarized in Table 3. For example, in the field of business and industry, the Fiji National Training Council (FNTC) has a structure, the Levy Grant Scheme, to encourage environmental education. In this scheme, private sector organizations submit 1% of their gross salaries to the Council to fund a program that enables employees to attend work-related improvement courses at a subsidized rate. It has been quite successful and is a pioneering work at the private level, as the coordination of private as well as public sectors are important in promoting environmental education. Valorization of such work would have a far-reaching impact on environment conservation and management. In many countries, NGOs are initiating demonstration projects. These projects have been successful in changing people's attitudes through real life experiences involving local people and generating income for local enterprises. The media have also been successful in raising public awareness by using local and modern media and by training journalists on environmental journalism and investigative journalism.

Table 3. Summary of innovative EE activities undertaken by B&I, NGOs and the media.

Service Providers	Innovative EE Activities
1. Business and industry	<ul style="list-style-type: none"> ■ Initiating eco-business activities such as production of ozone-friendly refrigerators, solar energy systems, pollution control devices and decomposition machines; eco-marking (or eco-labeling) and green lists. ■ Providing on-the-job training (on environmental impact assessments and ISO 9000 & 14000) for employees and environmental internships for students. ■ Initiating <i>Green Accounting</i>, <i>Green Banking</i>, <i>Green Productivity</i> and <i>Ecological Clean Program</i>. ■ Sponsoring production of educational and promotional materials and public campaigns. ■ Establishing funds for conservation activities. ■ Creating the Levy Grant Scheme, where private organizations submit 1% of their gross salaries to fund courses for their employees.
2. Non-governmental organizations	<ul style="list-style-type: none"> ■ Producing awareness materials and environmental awareness, training and research programs. ■ Mobilizing community resources and linking income-generation activities with EE. ■ Guiding conservation activities for environmental clubs. ■ Providing press releases to raise consciousness. ■ Establishing the <i>Green Volunteer Network</i> and <i>Green Bazaar</i>. ■ Implementing innovative activities such as demonstration projects, interpretation centers and alternate models of education. ■ Lobbying the media, government, industry and business for viable education programs.
3. Media	<ul style="list-style-type: none"> ■ Raising environmental awareness using both modern and local (traditional) media and establishing <i>Green Press</i>, <i>Green News</i> and <i>Green Wire</i>. ■ Creating forums for complaints, opinion letters, lobbying and articles. ■ Providing investigative reporting on the environment. ■ Contributing messages and feature articles on television, newspapers and radio. ■ Training reporters on environmental journalism. ■ Implementing innovative activities such as demonstration projects, interpretation centers and alternate models of education. ■ Lobbying the media, government, industry and business for viable education programs.

3.6. Major issues and problems

Issues and problems related to EE can be grouped into two categories: policy-related issues and program-related problems.

a. Policy-related issues

i. Lack of national policy

With the exception of a few countries such as the Philippines, Australia and Thailand, no country has formulated a national policy on EE. No coherent plan provides a link from the kindergarten to university levels. As a result, EE receives no priority action, no allocation of resources, no budget and no support, and thus is marginalized from the national mainstream. Because of this, even those countries that have initiated EE programs show inconsistencies and discontinuities in implementing EE programs and activities. There is no evidence of serious efforts being made towards building institutional capacity in EE.

ii. Bias towards physical science

Prior to the Rio Summit, environmental topics were taught only in physical science and geography classes. After the Summit, however, the focus has been gradually moving towards social science, liberal arts and the humanities. Yet explicit incorporation of environmental themes is still biased towards physical science courses. Nevertheless, because human activity is the primary factor responsible for the deterioration and destruction of the environment, social science aspects should be given the same level of attention as the sound management of environmental resources. For example, water pollution is the result of human actions. Therefore, in order to prevent it, it is not only necessary to understand its physical basis, but also to promote human awareness of the problem and encourage compliance with environmental laws. This can only be done through the integration of environmental themes into areas of education other than physical science.

iii. Lack of whole-of-government commitment

Although environmental themes have been integrated into the formal education system, most of the EE initiatives come first from the sectoral ministries such as Environment, Fisheries, Agriculture, Forestry or Natural Resources, and not from the Ministries of Education. Their efforts are mostly related to specific issues and geared towards changing knowledge, attitudes and skills. They are not broad and comprehensive in terms of achieving sustainability. It is not possible to get the necessary full commitment from the government towards environmental education activities unless it is addressed in totality. Such a whole-of-government commitment is possible only through the involvement of the Ministry of Education.

iv. Lack of institutional coordination

All the countries report a lack of coordination amongst responsible agencies in the region. Because of this, the agencies either duplicate activities or compete for resources. When the situation degrades further, mutual mud-slinging becomes a common phenomenon resulting in no action or delayed action. Several ministries adopt individual policies and procedures to pursue their own mandates without any

collective action or vision. Usually, there is no consultation among these groups and if there is any agreement, it is loose, vague and morally non-binding.

b. Program-related problems

The problems prevalent in education programs (including EE) are summarized below.

i. Inadequate manpower

There is a notable shortage of trained manpower, especially of environmental educators and facilitators, to teach integrated courses such as *Environmental Studies*, *Man and Environment and Nature Science*. No major efforts have been initiated to promote teachers' competency and capability. Conventional teaching methods, such as lecture methods, are applied to teach dynamic courses such as these. This reduces the quality of the education because there are no opportunities for students to observe directly the environment, or to be exposed to real-life situations.

ii. Rigid curricula and teaching methods

Existing curricula are book-based and examination-oriented. Further, the curricula are not oriented toward nourishing a sustainable society. Because classroom instruction is geared towards examinations, students prepare to appear for their final examinations and achieve high scores rather than develop actual skills and competencies in the subject matter. Despite the fact that environmental concerns are integrated into the curricula, they are neither vertically integrated nor horizontally coordinated. There are no vertical links between educational activities in one level with other levels, nor are educational activities within the same level horizontally coordinated with other course activities. Activities are duplicated, and teachers are often unaware of what other teachers are doing in other subjects. Students do not learn about the environment in critical ways and fail to see the interconnections that contribute to the overall complexity of the environment. Curricula are centrally controlled, and their development process is quite bureaucratic in nature. Furthermore, existing courses are tightly arranged and do not allow additional subjects to be incorporated. The unavailability, inaccessibility and irrelevancy of textbooks, instructional materials, manuals and guides have further aggravated the problems of effective curricular structure and processes. The pedagogy is mostly the "chalk-and-talk" method, and learning is based on the rote method and spoon-feeding. Because of this, students are encouraged to memorize rather than examine the problems critically.

iii. Inadequate physical facilities

In many countries, especially in rural areas, school buildings are dilapidated and do not have even minimal facilities such as furniture, classrooms, laboratories, libraries, resources, tools and equipment. Due to space limitations in some areas, several classes are being run in shifts. For example, in mountainous areas of Nepal and India, more than two classes share the same classroom. In Cambodia, the number of students is as high as 100 to 150 in a single class.

iv. Conceptual ambiguity

The concept of EE means many things to many people. In some countries, it is taken as another academic course without any relevance to, or bearing on, real-life situations, while in other countries, it is still in its infancy. Some believe that environmental education is a new perspective towards education and focuses more on values. There still exists confusion over its concepts and, therefore, its approach.

v. Unavailability of data and information

There is a great dearth of data and information on the problems of EE. Even when data and information are available, they are not necessarily accessible. The data and information should be designed so that they are both usable by and easily accessible to the general public. In many countries these days, data are stored in computer files. However, people who do not have access to computers, like many in Nepal, are virtually deprived of the use of such data. In such cases, these data should be reproduced in forms that are easily accessible to all.

4. Discussion

These findings indicate that countries of the region are aware of, and responsive to, the need for EE to improve the quality of human life. They have shown interest by incorporating environmental concerns into formal as well as non-formal education programs. Governments, NGOs, educational institutions, the media and other service providers have also made concerted efforts to meet growing environmental challenges. The media have taken environmental issues to the public. Many pioneering activities have already been initiated. Despite resource constraints, persistent poverty, rising populations and developmental problems, the countries of Asia and the Pacific have demonstrated an enthusiastic leadership in the field of EE.

EE has obtained momentum but has not been able to make the quantum leap towards preventing, stopping and reversing environmental degradation. Some of the reasons given below may help explain the situation and describe the stumbling blocks for EE in the region.

- (1) The problems of EE are universal in nature and directly related to the complex problems of development process, persistent poverty, growing population and environmental degradation. For example, the significant EE problem of over-crowded classrooms is directly related to the large number of children in the community and the resource constraints on classroom expansion.
- (2) Activities that have been described as success (or innovative) stories are in all forms of education. Some are widespread, while others are patchy, isolated and scattered throughout the region. These stories are the indigenous ideas of the Asia-Pacific region. In other words, they are the result of the unique wisdom embedded in the cultures of the region. We do not know if they would work well in other parts of the countries concerned, or in the region, or on a large scale. In order to determine their validity and suitability, these cases should be subject to pilot-application and replication.

- (3) Environmental themes are widely integrated into formal education courses. Yet we do not know how effective they are in real-life situations, or if formal education is the best way to achieve a sustainable society, a society that meets the needs of the present generation without compromising the needs of future generations. Research is necessary to provide the answers.
- (4) Numerous NGOs and other organizations are involved in the field of EE. Any organization can boast that it is successfully undertaking EE activities. Nevertheless, there is also duplication of activities and competition among different organizations. When this is so, then it is necessary to determine their status and synergize their strengths in promoting EE in the region.
- (5) Finally, merely raising awareness is not enough to promote EE. EE must go beyond awareness raising. It must inspire interest and encourage people to pilot-test new ideas and then, based on their evaluation, adopt them as integral parts of their lives. For this, more projects and actions are required to provide role models for successful EE efforts.

5. Some prospects and conclusions

Despite economic hardships and other problems, the region holds tremendous prospects for EE. The people of the region have shown great interest, enthusiasm and committed leadership in EE. They should be provided with incentives to keep up their spirits and encouragement to make a whole-of-government commitment to EE. Such incentives must first include a valorization of their innovations, success stories and exemplary works and, second, a facilitation of the sharing of their experiences and expertise with others within and outside their countries. Such incentives, if provided in the form of a “leg up” (by building capacity), rather than a “hand out” (by spoon-feeding or simply providing necessities), should serve as stimulus for the Asia-Pacific countries to make environmentally-aware decisions in a responsible manner.

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