

Session 4: Environmental Management of Coastal Area

And

Environmental Education and Practical Activities

Rapporteur: Prof.TANIGUCHI, Fumiaki

Keynote Session

Chairperson: Fumiaki Taniguchi

Keynote Speech 1

4-392 Thinking Like an Ocean: Marine Education Principles

that ensure Coexistence between People and Nature

Snively, Gloria

The theme of Dr. Snively's presentation was the principle of environmental education with regard to the coastal areas that teach us about coexistence between people and nature, and she presented the pedagogy of environmental education. The framework of environmental education encompasses the past-present-future time dimension and the proximal-intermediate-distal realities of the space dimension. Environmental education according to such principles starts with the "sense of wonder" gained through interaction between people and nature.

In environmental education, consideration should also be given to ensuring that children are able to embrace hope for a sustainable future instead of fearing for the future. To this end, direct experience, ecology education, the awakening of sensitivity, responsible behavior, marine resource management based on science and technology, the cultural heritage of native people, observations and technology, and establishing one's own view of life are all important aspects of education.

Keynote Speech 2

4-393 Marine and Coastal Environmental Awareness Building

within the Context of UNESCO's Activities

in Asia and the Pacific

Kuijper, Maarten

Mr. Kuijper reported on activities at the Asia/Pacific Office of UNESCO in Bangkok, Thailand. UNESCO has been particularly keen on formulating environmental awareness and has been implementing a variety of programs. The development and management of ocean and coastal zones require a cross-sectoral approach, and "environmentally-sound", "socially-equitable" and "culturally-appropriate" are among the most important conditions.

UNESCO is also known for its designation of World Cultural Heritage sites, and Mr. Kuijper introduced the beautiful scenery of Halong Bay (Vietnam), Komodo Marine National Park (Indonesia), the Great Barrier Reef (Australia), East Rennel Island (Solomon Islands) and the Tubbataha Reef (Philippines). UNESCO now also designates "Biosphere Reserves," and this designation is also being applied to coastal areas. Examples include the Ranong Biosphere Reserve (Thailand), Can Gio Biosphere Reserve (Vietnam) and Puerto Galera (Philippines).

## **Session 4-1**

**Chairperson: Asano Yoshiaki**

4-131 Junior Shorekeepers:

Canadian Youth Stewards of Their Marine Environment

Boire, Jason D.

The Canadian government promotes efforts to ensure that the general public has an understanding of the natural processes in the ocean, marine resources, and marine ecology, in order to promote sustainable development. Mr. Boire discussed stewardship on the part of young people participating in shoreline management and observation activities, citing an example involving 10 to 12 year-old children. The speaker emphasized the importance of awakening sensitivity and a sense of wonder toward nature and life.

4-370 Coastal Seas as a Context for Science Teaching:

A Lesson from the Chesapeake Bay

Bell, Wayne H., Fowler, Erin M. and Stein, J. Andrew

The speakers discussed a project to monitor the saline level of Chesapeake Bay, conducted with the participation of high school and university students, which was very successful. The data that was collected was reliable and closely matched the results of research by scientists. In addition, the process of collecting data was also a very effective teaching technique for environmental education. The presentation introduced the influence of salinity and dissolved oxygen on the blue crab and fish and other organisms, and how changes in rainfall in the bay due to El Nino, etc. lead to changes in the overall ecosystem of the bay.

4-190 A Study of an Environmental Education Program  
that cultivates a Sense of Values  
toward the Sea through Observation of Sessile Invertebrates  
in the Port

Nakajima, Kiyonori and Kondo, Yukie

Forty-five 5<sup>th</sup> and 6<sup>th</sup> grade elementary school children participated in two fieldwork projects in July and August. The students studied what kind of organisms would adhere to plastic sheets and also learned about ecology and marine pollution through observations of plankton. In addition, questionnaires asking, "Who polluted the sea?" and "What can you do for the sea?" were given to them to enhance their awareness.

4-385 Thailand Approaches : Coastal Management  
through Environmental Education

Sudara, Suraphol

Natural resources in coastal areas are disappearing. We need to remember that such natural resources belong not only to us; they also belong to future generations. Unless people become environmentally conscious, the destruction of the environment will continue. Therefore, it is important to promote such awareness among decision-making organizations and agencies. In Thailand, depletion of resources due to overexploitation, erosion of coastal lines, and increases in

soil salinity due to shrimp farming has been accelerated. Even if the former scenic beauty could somehow be recovered, such once-damaged environments would require rehabilitation.

Prof. Sudara concluded his presentation by emphasizing the importance of international cooperation and enhancing awareness among decision-makers who are involved in development activities.

## **Session 4-2**

**Chairperson: Bell, Wane H.**

4-021 Environmental Education and Information

on Coastal Environments in Russia

Sokolov, Nikolay V.

Mr. Sokolov spoke on environmental education at Russian universities, in particular giving examples of the application of environmental education in the field of mathematics. Specifically, he proposed a method for using a knowledge of mathematics to analyze real data and recognize the state of the environment. Applying differentials, integrals and probabilities to calculate changes in water levels, purify water that has been polluted, and calculate the status of water pollution would establish a method for "mathematical modeling for the environment." This would provide the foundation for a consideration of environmental changes, pollution and so on.

In this "mathematical modeling for the environment," a flow distribution would be calculated through the probability of movement of water and particles, in order to determine how dispersing pollutants will move in coastal zones. Moreover, while based on estimates derived from such calculations, observations would be performed at the actual site to determine the special characteristics of the particles in the dispersed pollutants in the coastal region, and the calculated values and the actual measurements and estimates would be linked for comprehension. The development of this kind of curriculum can be applied not only to modeling of the movement of dispersed particles and substances but to water purification as well.

At present, courses in environmental education are being set up within the existing curriculum in Russia and, in addition, various universities are setting up environmental lectures and environmental studies departments. New universities devoted to environmental studies are also being constructed. In the general curriculum, efforts are underway to incorporate environmental education not only at the high school level but at the elementary and junior high school level as well,

and there is also a move to have university students go to instruct elementary and junior high school students.

#### 4-288 Environmental Education in Northwestern Europe :

##### the Case of the North Sea

Ducrotoy, Jean-Paul

In the countries of Europe that border the North Sea, consideration from a global perspective is underway in order to conduct an environmental evaluation of coastal zone ecosystems over a wide area. The impact of the El Nino phenomenon in bay coastal areas, the climatic fluctuations, the melting of the icecaps due to global warming and other phenomena are becoming increasingly serious, and the direction of these events must also be reflected in education. Improving the quality of environmental education while utilizing the internet, teleconferencing, etc. will promote communication among universities, and the employment of information strategies will make it possible to hold forums, create networks and link research with education.

An effort will be made to enhance ties with the global community through the "Marine Biodiversity in Europe" (BIOMARE) research project being promoted with the aim of achieving sustainable development.

#### 4-341 Community-Based Coastal Resources Management

##### in Cambodia

Kim, Nong

The speaker reported on two case studies in Cambodia: (1) the Participatory Management of Mangrove Resources project in the Peam Krasaop Wildlife Sanctuary, and (2) Community-based Resource Management.

In addition, the Participatory Management of Mangrove Resources project was promoted with input from the local community regarding control of resources in the local coastal region and in coordination with the policies of official government agencies.

Based on a participatory regional approach, life histories were prepared and workshops and the like held and, using community-based coastal resource management techniques, eco-management planning between the local community and the government, resource management, and the preservation of natural resources were promoted in an effort to arrive at sustainable lifestyles. It is hoped that the providing of technologies and outside technical assistance will enable the management of natural resources and the continuation of environmental education relating to technologies and resource management to the next generation.

The major problem to be resolved in the future is to overcome the antagonisms among organizations, and (1) community-based participation, (2) lateral mechanisms, and (3) neutral promotion are needed.

#### 4-173 Tidal Flat Environmental Education Curriculum in the Ariake Sea Coastal Area

Hayakawa, Rumiko and Toubai, Sadayoshi

The speakers reported efforts to preserve wetlands that are one of the activities of WWF Japan, focusing on the activities relating to the tidal flats in the Ariake Sea. The environmental destruction in the Ariake Sea (a habitat for mudskippers and other creatures and a way-station for migratory birds such as the snipe and plover) caused by reclamation activities in Isahaya Bay is becoming a serious problem. For this reason, nature preservation activities through environmental education were conducted, focusing on this region as a key preservation region. The ultimate objective of this program is the establishment of the Ariake Sea tidal flats as a national wildlife sanctuary designated under the Ramsar Convention.

In the city of Kashima in Saga Prefecture, an advisory group to study environmental education programs for the Ariake Sea has been formed with the participation of representatives from the local government in Kashima City, the Board of Education, schools, NGOs and other organizations. Local elementary schoolchildren were also able to experience outdoor programs (birdwatching, investigation of living things in tidal flats, a purification experiment involving clams, a visit to an "undersea forest" and so on) to study the relationship between tidal flats and forests, rivers and the ocean. The speakers also presented the joint implementation of environmental education in which extensive teaching materials were developed and distributed in order to further environmental education regarding the Ariake Sea, and training sessions for teachers and supervisors were held.

## **Session 4-3**

**Chairperson: Sudara, Suraphol**

4-254 Newspaper's Role and Limitations

in Environmental Reporting :

Case Study ; Isahaya Bay Land Reclamation Project Issue

Ohkura, Yoshiko

This presentation focused on the role of newspapers as mass media organs for reporting on the environment, using the Isahaya Bay reclamation project as a case study. A discussion of the role of the media as demonstrated in the Isahaya Bay reclamation project and the role of journalism, focusing on newspaper reports, was held, and reference was also made to the problem of consensus-building and of local residents expressing their opinions.

Ms. Ohkura listed the major roles of newspapers as Spectator, Watchdog and Servant of the State, and also asserted that the media also plays another role: that of a Trickster.

Nevertheless, in the case of the Isahaya Bay issue, the effect of newspapers never attained that of a bottom-up movement to the government, as the social context had not been completed. However, the speaker pointed out that, despite these limitations, the advantage of newspapers is the ability to preserve information through the media. She also advanced the view that the establishment of organizations for harmonization and cooperation was needed at the earliest possible opportunity in order to pursue joint action centering on the local community.

4-263 NGOs and Community-Based Organizations (CBOs)

in ICAM Programs in the Gulf of Guinea (West Africa)

Adam, Sikirou Kola

The topic of this presentation was the activities of the Integrated Coastal Zone Management (ICAM) programs in the Gulf of Guinea in West Africa. Mr. Adam cited the lack of dialogue

between the local community level and the government level as a problem. To conduct practical NGO activities, and to establish community autonomy, a cooperative relationship for managing coastal zones must be established, network strategies for acquiring project opportunities must be established, and a plan of action for promoting community management participation is needed.

For this purpose, educational activities for NGOs were conducted with regard to ecosystems in coastal regions and coastal zone management, and workshops were held in each region. Efforts are being made to establish communications for computer learning, promote a participatory approach, and improve technical knowledge and skills, and also to define the role of NGOs, promote networking with relevant organizations, and conduct educational training for the plan of action, etc. in the implementation of the overall action plan.

3-055 Japanese Poets Fight to save the Seto Inland Sea

with Their Pens

Shapiro, Harvey A.

For the past 40-odd years, the Seto Inland Sea has been developed as an industrial region, through reclamation, the construction of artificial islands and so on, and it has been beset by the occurrence of "red tides" and other environmental problems. The problems involved with reclamation and the current status of these activities and the environmental destruction of the Seto Inland Sea were presented through the activities of two poets, Makiko Habu and Keisuke Aoki. Points were made regarding the direction of government and policy as they relate to environmental preservation and the restoration of nature. The speaker also touched on the need to restore an animistic perspective centered on the ecology rather than one centered on human beings, as well as the importance of cultural and religious aspects and other spiritual and psychological environments.

4-272 Underprivileged High School Students are provided

the Opportunity to participate

in Scientific Research performed in the Field of Environmental Science

Chambers, Patricia, Dendrinis, Georgia and Murray, Laura

The speakers reported on the activities of a project conducted through monitoring and investigation, data analysis and real scientific data collection regarding seaweed at Horn Point on Chesapeake Bay

in the state of Maryland in the United States. The project was implemented through cooperation between research institutions and scientists and with university institutions, and data was gathered from four locations over a period of several weeks and then filtered, and measurements of biomass and chlorophyll were conducted. Based on this data, a web page was created and river cleanup activities and the like were also conducted.

Moreover, through these activities, changes in the environmental awareness of the children in the facility were also noted, and the activities will be continued on an ongoing basis.

#### **Session 4-4**

**Chairman: Kuijper, Maarten**

4-264 Environmental Education through the Provincial Nature

and

the Green Manufacturing

Iio, Yoshiyuki

In the city of Hamamatsu, Shizuoka Prefecture, training of engineers with a rich humanitarian spirit is promoted through environmental education centered at nearby Lake Hamana aimed at preserving the local natural environment. It is designed to promote a true sense of the firm connection between human beings and nature, and enable participants to become familiar with provincial nature and, through "green manufacturing," to conduct ongoing environmental education activities in a spirit of fun and enjoyment. Practical activities include the creation of a solar-powered boat using recycled PET bottles and a Lake Hamana Clean-up Drive, to encourage spontaneous thought regarding the nature of recycling and reuse while having fun. Other environmental education activities include the conducting of "eco-tours," an Environmental Education Declaration centered around the solidarity of the family, students, schools and the community, the creation of biotopes and so on.

4-362 The Environmental and Touristic Corridors

and the Sustainable Development

in the Coastal Seas in the Department of Choco, Columbia

Conto, G., Jose H.

Eco-tourism designed to contribute to sustainable development in the Choco region of Columbia and the proper role of development were raised as important issues. This is a region inhabited by a wide variety of life forms, and it has been designated a national park and a habitat for a variety of wildlife. Currently, due to its location adjoining the Panama Canal, it is becoming a focus for development, but in order to strike a balance with the preservation of the ecology and the natural environment, sustainable development through the creation of an environmental corridor for living things has been established as a goal. The speakers asserted that a consideration of the relationship between human beings and nature and the relationship between water and our lifestyles is needed.

4-108 Coastal Environmental Education through Role Integration  
by Professionals Towards Sustainable Development

Alungal, Balchand N.

Mr. Alungal discussed the need for coastal environmental education and for a network of specialists in research into coastal zones. He described the framework and content of the People's Participatory Program (PPP) in a presentation that included discussion of educational prospects, cultural aspects, economic background, cultivation of aesthetic sentiments, a global perspective, personnel management, the management mode and philosophy, environmental education programs, the construction of information systems, community activities, nature management, and the integration of traditional techniques and modern management principles.

The speaker also stressed the importance of various organizations, including advisory agencies and private agencies, facing the need for management of coastal zones and organizing for this purpose, as well as the importance of participation from various organizations and personnel training.

4-346 Environmental Conservation in the Coastal Areas  
of the Sea of Japan

Watanabe, Masahiro; Honjo, Shiro, Yamamoto, Kazuyuki; and Izumi, Shin-ichi

The speakers reported on snorkeling classes and volunteer leader training programs conducted at the Takeno Snorkeling Center, operated by the Ministry of the Environment, located in the San-in Kaigan National Park. At the Center, snorkeling classes for children are held, and the children study background information and observe the undersea forests and the living creatures that inhabit the ocean in order to develop their powers of observation. In the volunteer leader training, training manuals and guidebooks containing expertise were prepared. At the time of the oil spill from the tanker Nakhodka, the Center organized a volunteer group to help clean up the oil and surveyed the impact on the ecosystem.

The speakers reported on the need for environmental education in order to preserve an environment that allows people to learn from nature.

### **Summary Session**

**Coordinator: Dr. Wayne H. Bell**

**Vice Coordinator: Professor Gloria Snively**

**Rapporteur: Professor Fumiaki Taniguchi**

Dr. Bell: The approach to science and technology, computer training and environmental education are crucial. In addition to these, teacher quality must be improved, and we must create environmental education programs, provide a "period for comprehensive and integrated study" and conduct cross-curriculum development. Also, we must pay attention to the issues of landscapes and the carrying on of cultural traditions. We must also find a way to promote networking.

Professor Snively: The basis of environmental education is outdoor learning -- in other words, education through direct experience — and, as a result, to strive to bring up children who will act responsibly. It is also necessary to learn monitoring skills. In this way, sustainable environmental education rooted in the local community must be achieved.

Professor Taniguchi: I would like to touch on three trends in our session:

#### **(1) Theory**

1. Principles of environmental education: the establishment of a pedagogy and framework for environmental education were cited.

2. Environmental management: the need for a cross-sector approach was confirmed. For this purpose, the approaches of "environmentally-sound", "socially-equitable" and "culturally-appropriate" were postulated.

## (2) Case study reports

1. Natural environment: The intention to resolve global environmental problems using data based on scientific education is necessary.
2. Social environment: Promotion of social education activities and the establishment of a common social sphere are needed.
3. Mind environment: The importance of "human education" and matters based on human sympathy was pointed out.

## (3) Role of environmental education

1. Development of teaching materials: Integration and a framework for materials are required.
2. Teacher quality: This is the most important issue and a difficult problem. Accordingly, teacher training is also indispensable.

Professor Snively: Impressions of the poster session ; The poster session must have a theme and include educational elements

Mr. Kuijper: Regarding the impact of environmental education, I wonder whether it will be possible to change our values, have a sufficient impact on children, change the entities for consensus-building through the efforts of policy-makers, and so on.

(from audience) Mr. A: In coastal cleanup activities and the like, people will have more of a commitment if they have an awareness of whose sake they are working for.

(from audience) Mr. B: It is valuable to be able to learn from so many different cultures at an international conference like this.

Dr. Bell: And enlightened education will help the community itself to grow.

Professor Snively: Another issue is the difficulty of introducing the cultivation of a sense of values into education. However, we should encourage this by conducting cultural comparisons and comparing case studies.

Dr. Bell: Furthermore, we should not stop only at environmental education from the scientific aspect alone; an approach to environmental education from the cultural and artistic aspects is also needed, as is an approach from the global environmental aspect.

Dr. Sudara: Overall, monitoring skills by means of scientific monitoring, an environmental education curriculum using monitoring, and a sensitivity to the local community and so on are also important.

Professor Snively: Canada is also facing the First Nations problem; we must learn from the wisdom of the indigenous peoples. If we ignore this wisdom, ultimately this will mean a loss of resources. This must be incorporated into environmental education.

(from audience) Mr. C: Not only that, but conducting environmental education within companies is also indispensable.

Professor Taniguchi: Essentially, environmental education requires one's original childhood experiences with nature. Furthermore, knowledge must be increased until it becomes wisdom. The concepts of civilization and culture must also be clarified. Civilization – scientific civilization, material civilization and so on – has a universality that makes time and space uniform. Culture, on the other hand, is based on unique individuality and is rooted in ecology. Accordingly, in the places where the civilization environment and cultural environment intersect, present-day specific individual environments are established. This subject requires further discussion.

Dr. Bell: What about the question of improving teacher quality?

Professor Taniguchi: This is the most important matter. Teacher training is needed.

Mr. Kuijper: I think we must also develop an approach to science and research that can contribute to education.

(from audience) Mr. D: The current status of the move to set up a "period for comprehensive study" in Japan is unclear, and those on the front lines are facing a variety of problems. Isn't the establishment of the "pedagogy for environmental education" that was mentioned a moment ago lacking?

Professor Taniguchi: Yes, that's correct. And the objective of training using environmental problems is not to nurture people who will resolve global environmental problems but to nurture people who are rich in spirit. If you do that, you will nurture people who do not do things that destroy the environment but those that are concerned about the environment.

In Japan, regarding the establishment of a "period for comprehensive study," four topics have been raised: health and welfare, international exchange, information learning and environmental education. However, there are concerns that some of the topics will come second to those that are means to an end: the English language education under international exchange and the computer skills under information learning. The environment and human life (health and welfare) are the objectives, and more emphasis should be placed on them.

In addition to training in problem-solving ability, environmental topics must be incorporated into each course. For this purpose, we must nurture survival ability in the field: in other words, the ability to live. As was noted a moment ago, improving teacher quality and improving the environmental awareness on the part of the teachers themselves is also needed.

Mr. D: I think we need to conduct environmental education for the adults themselves, and also for children and teachers and children and parents together.

Professor Taniguchi: The problems of teaching materials, teacher quality, and of the creation of networks have been included as major topics at the UNESCO Asia/Pacific environmental training seminars for the past three years. Among these, improving teacher quality is the most important. Even if you have a manual, it is crucial that you don't have someone unfamiliar with that manual but a teacher who strives for self-awareness.

Professor Snively: What kinds of textbooks are used in Japan? I imagine that most are based on Western scientific concepts, but wouldn't the ideal be to have those that are based on each country and region? Among the science textbooks, are any that are unique to Japan included in the curriculum?

Mr. Iio : Under the system in Japan, teachers use textbooks approved by the Ministry of Education, Culture, Sports, Science and Technology. However, since teachers are imparting knowledge, it is important to bring about a shift from the things that one has discovered and felt oneself to a common human understanding. Specifically, I feel that one way to provide a doorway to environmental education would be to make learning from local culture the starting point and learn from the wisdom of nature.

Dr. Bell: Summing-up and greeting.