

# The Characteristics of Environmental Education in Dalian City in China

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The rapid development of the economy and the higher standard of living as well as the large quantity and expenditure of waste, deforestation, the over-hunting of animals, unregulated disposal of industrial effluents, and smoke extraction and waste water from factories have all contributed to spoiling the environment in China, both in terms of the natural environment and in the way people live. Since the 1990s, the government of China has recognized the need for environmental education with an emphasis on recognition of problems related to despoiling the environment. Dalian city has been designated as a model city for environmental education in China, and is known to be one of the cities where government-led environmental education programs have been provided much earlier than in other parts of the country.

Recently, the authorities have been investigating ways to solve environmental problems by preventing the occurrence of pollution as well as by triggering the improvements already found in existing measures and methods. The authorities value the role of education in promoting good environmental management. Since 1990, Dalian city has been designated by the government as "an environmental model city", and since that time, a construction project for a quality environment called "Dalian City as an Environmental Model District Plan" was set up. Furthermore, an "Environmental Education Program" was included as part of this project. This report describes the character of environmental education in Dalian city, which is extremely diverse in its settings and target audiences. The author also presents the results of an investigation for developing and administering high quality environmental programs for future environmental problems in China.

Key words: characteristics, Dalian, environmental education

## 1 Introduction

Located in Liaoning Province with a population of 5.6 million, Dalian city has the superb characteristics of well-established industry and economy, and is also active in trade and tourism. Dalian is an important city with a large port and is recognized as one of the fourteen open coastal cities in China. Many foreign-funded companies are planning to extend their business to Dalian, which is a city designated by ordinance, enjoying the reputation of a "good environmental city", placed within the 5th level on a quantitative test (Air pollution, Water pollution, Soil pollution, Solid waste management, A urban design, Road maintenance, Cultural construction, Tree planting, Education, Institution maintenance, etc.) on total environmental scores in China.

The construction project for "Dalian environmental model districts" has been undertaken to develop and continue the government-led plans for basic environmental protection in China, and a firm basis for the realization of a high-quality environment has been obtained by this project. Environmental education is seen as an ongoing process leading to the final goal of environmental quality as desired by the government of China, and has been included in this project for this reason.

This paper describes the features and status of environmental protection activities in their native settings, groups and audiences for the effective planning of environmental improvement in the model city, Dalian. This paper also suggests a plan of action for environmental protection education by clarifying the subjects to be tackled by the people who are involved in the Dalian Environmental Education Programs.

## 2 The Environmental Education Network

### 2.1 Location of the Environmental Education Network and its Intended Accomplishments

Regarding the popularization of environmental education in China, "The Environmental Protection Law in China" (Vol.22, 1989), Chapter 1, General regulations, article 5 calls for the government to promote the scientific development of environmental protection education with special emphasis on the reinforcement of the research and development of Environmental Science and Technology. Moreover, the environmental protection regulation aims at higher levels of standards by spreading scientific knowledge on environmental protection. Based on this regulation, "Environmental education staff" is included in the Department of National Environmental Protection, and the "Environmental Education Center" is affiliated with each environmental department in local areas; in other words, each "province (local government)" or "city" plays a central role in the publication of administrative policy and law-making for environmental protection, and also offers environmental education for the general public, for schools and corporate education, for administrative office education, and for daily activities leading to an improved environment.

Recently, the National Environmental Protection Agency has drawn plans to introduce regulations for a certification system for the Environmental Education Organization. The following factors are crucial for accreditation: 1) well-equipped facilities, 2) enough personnel, and 3) well-prepared materials (texts). This system is a level-dependent qualification system: when accreditation is authorized by the National Environmental Protection Agency, a class with a theme regarding environmental protection will be created for administrative people, and when accreditation is authorized to "local government (Province)", a class for the citizens will also be created. This system of qualification will aid in the popularity and development of educational activities on environmental protection.

The Dalian Environmental Education Center was first set up in 1986 in affiliation with the Environmental Protection Agency under the former name of "The Chinese Environmental Protection Department Dalian Press Station", which was renamed later. Currently, the Dalian Environmental Education Center is playing a central role in spreading information regarding environmental education according to the competency measures proposed by the local government of Dalian city, Liaoning district, in cooperation with the people's government offices such as municipal and local administrations, the Highway Office, the Environmental Protection Agency, the Observation Center for Environmental Control, the Institute for the Planning of Environmental Science, the Municipal Committee of Education, and universities and businesses. Fig. 1 shows the network of Dalian environmental education.

### 2.2 Activities of the Dalian Environmental Education Center

The Dalian Environmental Education Center is located at the same place as the Dalian Environmental Protection Observation Center and the Dalian Planning Institute for Environmental Science. The total number of the staff is fourteen, among whom four are university graduates, and three are from special (vocational) schools. The specialties of the staff include the fields of chemistry, geography, biology, and management. Other staff consists of photographic technicians. The major activities of the staff include: (1) teaching and training and (2) editing and compilation of the materials for educational information on environmental science.

#### 2.2.1 The basic concept of environmental education

The following are the municipal guidelines for environmental education.

\* The ultimate goal of environmental education for the general citizen is the development of an environmentally literate citizenry who are cognizant of environmental regulations and conscious of

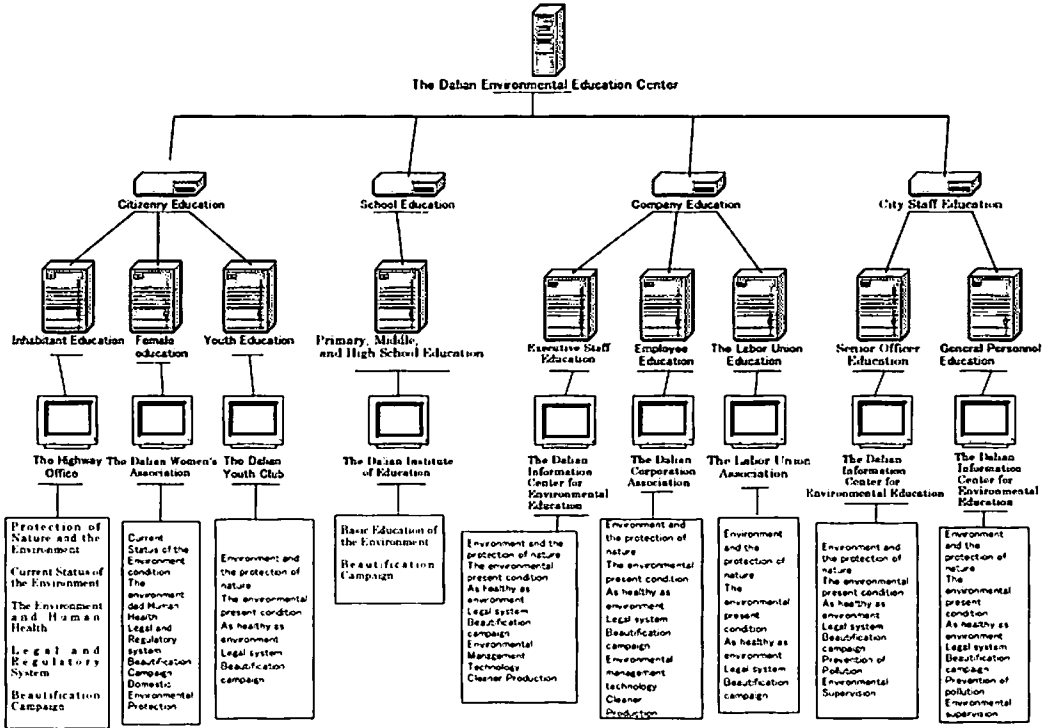


Fig.1 The Network of Environmental education in Dalian City

environmental problems.

\* In school education at the primary, middle, and high school levels, the students are given sufficient environmental knowledge.

\* In university and graduate school education, the Environmental Protection Agency, the Environmental Observation Center, and The Institute for the Planning of Environmental Science will send lecturers to provide students with more specific and higher education regarding environmental protection. Information on legal and regulatory systems and environmental technology will also be provided.

\* For the employees in businesses who need to recognize practical knowledge on the prevention of environmental pollution in their jobs, in-office education will be backed-up by sending professionals or experts/specialists to the companies to give lectures or hold seminars.

\* The staff at the Environmental Education Training Center will be educated through on-the-job-training (OJT) to improve the quality of their work.

**2.2.2 Specific activities**

The following are the contents of activities of the 8th five-year plan:

(1) A summary of the past records of the 8th five-year plan from 1990 to 1995

\* For citizenry (local and municipal), and farmers in rural and agricultural districts, environmental education was given for three years from 1989 to 1991, and 79% of the citizen were educated (prevalence rate: the number of attendants to the total population), and the certificate was given to the attendees who passed the examination.

\* For the employees in businesses, experienced employees of middle-level standing were educated to spread knowledge and experience to the rest of employees in the company.

A total of 120,000 people in businesses were educated. The prevalence rate amounted to as much as 89%.

\* In school education, four schools (two primary and two middle schools) were chosen and designated as model schools for environmental education. The students in these model schools exchanged information with other model schools in Liaoning district to enhancing environmental consciousness through this exchange program. The prevalence rate for schools was 80%. Likewise, a similar type of education was given in kindergarten, and some kindergartens in Lushun (district name in Chinese) appeared on television. Furthermore, these kindergartens were introduced to all districts in China as good model kindergartens for environmental education.

(2) The following are the records of the 9th five-year plan from 1996 to 2000:

\* The booklet entitled "Millennium Activities on Environmental Protection in China" was compiled for publication.

\* An Exhibition for an environmental protection campaign was held in October, 1996.

\* The booklet entitled "Planning and Implementation for Environmental Education" was compiled for publication in cooperation with the Environmental Protection Agency, the Education Committee, and the Public Relations Section.

(3) The following include other daily activities for the publicity of environmental education:

\* Publicity is made through television, radio broadcasting, and newspapers. The newspapers that provide information on environmental education include the "Dalian Daily Report" (a bulletin), the "Dalian Wanbao" (the evening edition), the "Dalian Fazhi Ribao", the "Dalian Gongren Ribao (the laboring class)", the "Bandao Nongbao" (newly-published), the "renmin Ribao" (nationwide circulation), and the "Environmental Report" (nationwide circulation), which has a larger number of subscribers than the local papers. The Center sends reporters to Environmental Report. On TV programs such as "Huanshi Xiezheng" and "Law Tiandi" etc., specialists or experts are invited onto the programs to talk about current environmental protection issues, and also to explain the regulations or laws related to environmental topics for the viewers. Through these TV programs, the viewers have the opportunity to learn about the problems connected with environmental protection from both positive and negative sides, and viewers will be able to weigh the pros and cons through this vehicle of television.

\* The Center and the "Dalian Daily Report" have invited essays on the topic of "Environmental Protection" every year during the summer vacation since 1993, and have selected some to appear in the newspaper.

\* Since 1993, radio broadcasting has been used for propaganda for laws and regulations as well as for basic knowledge on the environment. A hotline on the radio has been opened since 1996. The radio program goes on the air for 45 minutes every week; the first 30 minutes are the time for questions from the listeners (the answers are sure to be given next week if not given then), and the latter 15 minutes are devoted to comments on regulation issues, information of industrial development and environmental protection.

\* An air pollution report (TSP, SO<sub>2</sub>, NO<sub>x</sub>) had been serialized weekly in the "Dalian Daily Report" once a week since July 1997, but since 2000 the report has been provided everyday. A daily report for data on marine pollution is not available; however, whenever accidents occur that may cause marine pollution, a warning is issued to give detailed information about the site of the accident, particularly to those who are responsible for the management of sea bathing places.

\* A total of 100,000 leaflets (bills) are distributed on World Environment Day (June the 5th) every year, and the municipal staffs go into town to hand out the bills directly to the people. Also, leaflets (fliers) are distributed for information. Lecture meetings are held for corporate employees, and mayors and governors talk on the radio programs to discuss population plans, environmental status, and basic guidelines of the environment.

\* Farmers are given notice from the authorities that agricultural chemicals should not be used for farm products, and citizens are advised to buy the vegetables free from organically-grown vegetables. organically-grown vegetables are examined by the Technical Audit Department and the Environmental Protection Agency, and if given certification, they are labeled "Green Food" in the market, which provides notification of certification to the consumers.

\* Questionnaires have been sent to citizenry to investigate their environmental consciousness every year since 1998.

\* Textbooks concerning environmental protection have been published. The following are such works in preparation.

(1) "Polluted waste volume," "Waste treatment methods for the prevention of discharging newly-found chemicals" and various kinds of texts on basic knowledge for environmental protection laws and regulations.

(2) Texts for children: Texts created for children in kindergarten and primary schools have been praised and have been well accepted by the government.

(3) A text for both teachers' and corporate employees' use is now in preparation with the cooperation of Kita-Kyushu city, Japan. These texts will be targeted mostly to company workers.

(4) For farmers' use, texts have been planned and are now in the process of compilation.

(5) For city officers and the staff associated with the Environmental Protection Agency, a text entitled "Technical training and practical methods for vocational use in the field of environmental protection" is being planned for publication.

\* Regular Events

Regular events related to environmental issues are held all over the country in China (Table 1). The Publicity Education Center has an active role as an organizer and is working on environmental activities by taking the initiative in other organizations and groups.

Table.1 Regular events

Date	March 12	March 31	April 3	June 5	August 22
Event	Tree planting	No smoking day	Bird lovers' day	World environmental day	World globe day

Table.2 Magazines and technical books

China Agenda 21	Analysis of Ecology	Environmental pollution treatment
Century end Topics: The environment and development	Environment and Economic cost	Collective papers on green production
Administrative penalty in environmental regulation	Destruction of Ecology	Water disposal methods
The details of Environmental administration	Biological diversity	Environmental education
Sulfur pollution: treatment and control measures	Exhaust gas treatment in the chemical industry	

### 2.2.3 Books and Library

The Environmental Publicity Education Center has a library where magazines and technical books are owned and kept (Table 2).

In the Center's library, no desks or chairs for users are available, and the number of books is very small. No reading rooms for people at large (including students and corporate employees) are available. The reading room in the Center is used for staff and also as a tentative place to stock printed documents prior to distribution. The documents compiled and published for preparation by the Environmental Education Center are distributed free of charge to persons in charge as well as to those who need the documents. In the market, the selling rights to the documents belong to the printing company, and no copyright payment is given to the Center.

### **2.2.4 Production of Videotapes for Educational Use**

The Dalian Environmental Education Center recognizes that the use of the videotapes for environmental education as well as for advertisement is effective, and the following videotape production is planned:

- Information about world environmental problems is provided by watching videos, and through these videos people can learn about world experiences with the environment and at the same time, their environmental consciousness is raised.
- Environmental education is one of the government's policies, and the programs on videotapes will be produced individually for the citizenry, primary school students, middle school students, and high school students, respectively.
- Information regarding environmental policy is given to the city officers first and then to the citizenry.

The following are the programs on the videotapes.

- What is the environmental situation in Dalian? (This is the information for the environmental protection specialists)
- Videotapes for people abroad (for Advertisement (PR use))
- What is the environmental situation in Dalian City? (for the city officers)
- Pollution now and then (for the citizenry)
- Accident records (for materials to be saved)

The productions of video programs in preparation are as follows:

- A Reconstruction and Rearrangement plan for a Model environmental district in Dalian city
- For understanding the global crisis (video programs for environmental education for citizens, students of primary school, middle high school, and high schools)
- Video programs for knowledge on environmental protection (the measures taken for factories, the role of citizens, the measures taken for buses and truck)

The Center is targeting the citizenry who need environmental education. The ultimate goal of environmental education is the development of an environmentally literate citizenry capable of and willing to act responsibly, which will contribute to improvement of the environment around their communities, offices, and homes, finally leading to all areas of Dalian city. In Dalian city, public organizations such as major government organizations and the educational organization of the army, have production staff for video programs, but no corporation is available to produce and sell educational video programs for the market.

### **2.3 Environmental education at schools**

The Dalian Educational Committee implements an entire plan of environmental education at schools, and based on the decision of the original plans, each school adopts the plan and puts it into use at school. In Dalian city, the 16th middle school has been designated as a model school, where students learn about the environment using the textbooks. If this trial is successful, other schools will follow. The trial is still going on.

#### **2.3.1 The Dalian Education Committee**

In China, the Education Committee belongs to the government organization that controls both schools and teachers. Therefore, the Education Committee has full responsibility for decision-making as well as for the fundamental details on how environmental education is provided by conforming to government policy. The Dalian Education Committee put emphasis on school education because environmental education should be introduced in stages as early as possible to primary, middle, and high school students. In China, however, compared with other developed countries, the general education level is lower and hence educational methods or techniques regarding school education in general need to be introduced by other countries from abroad. The five essential features of education provided by the Education Committee are: (1) pre-school education, (2) fundamental education for primary, middle, and high school students (regular education), (3) job-oriented education (vocational education), (4) adult education (education for workers and farmers), and (5) university education. Among those educations described above, the Education Committee is convinced that

"fundamental education" is considered to be most important. The figures of those who will be given fundamental education are 780,000 in Dalian city; primary school students (460,000 - 470,000), middle and high school students (230,000 - 240,000), and university students (70,000 - 80,000). The students at primary, middle, and high schools, and also university student should have the first priority for environmental education. Likewise, education for merchants and senior people is given in every district, but it is beyond the control of the Education Committee. In companies and local districts, the Retirement Management Office will offer general education including environmental education. Regarding pre-school education, the nursery school will take care of children less than 3 years old and for 4 to 5 year old children at kindergarten. Children commonly used to stay at their grandparents' in the absence of their parents, but recently parents have become involved in their children's education, taking their children to nursery school or kindergarten for their primary education. Through this mass education, children can learn social regulations and take sanitary education.

### 2.3.2 Elementary School Education

The elementary school education is focused on group activities to reach a particular set of objectives and planned educational experiences that are intended to increase environmental consciousness. Children will learn about environmental changes in Dalian city and will have to take part in a "Tree-planting Activity" (each child has to plant an area with trees). This activity will raise the children's consciousness on the environment.

In the class for some primary schools, students use the following textbooks once a week for environmental education: [environmental education for primary school students of the 1st and 2nd grade] (26 pages), *ibid.* for the 3rd and 4th grade students (44 pages) and *ibid.* for the 5th and the 6th students (53 pages). In primary schools in general, life discipline and sanitary education is taught under the subject of "Labor". The 2nd grade students learn "tree planting" through a text, and the 6th grade students learn more profound educational content. Audio-visual education such as videotapes and movies are offered to the students of primary school in most of the educational settings, because this type of education is more effective than just using textbooks. Likewise, speech contests and essay contests are held to enhance environmental consciousness. The following are the themes for a recent essay contest: (1) I love my hometown in Dalian city, (2) Garbage around us, and (3) What we have to do to protect our environment. The problems arising in the educational process on the environment in primary schools include the deficiency in teaching technique or methods in education (instruments and educational materials). Also, finding enough qualified teachers to teach students is a difficult problem.

### 2.3.3 Middle school education

The middle school students learn environmental problems under the individual subjects given in the whole course of a curriculum. In the subject of "biology", for example, they learn the ambient life environment of creatures, the ecosystem, the population and the environment, and environmental protection. In the subject of "geography" they learn water resources, forestry resources, and mineral resources in association with environmental problems. In particular, environmental education is emphasized in the subject of "fieldwork", and the 2nd grade students have to take "fieldwork" for credit. The issues studied in fieldwork activities are high level programs including "Observation on acid rain", "Investigation of water resources", and "Education on global warming issues". They practice "Tree planting" for practical education and undergo training under the subject of "practice and training". In environmental education at middle schools, the 16th middle school at Dalian city has been designated as a model school where various kinds of methods for environmental education are experimentally given and the results considered for use in policy-making by extending the model schools.

The 16th middle school at Dalian is located at Zhongshan district Luxun Road 7, and this school links the middle school with the high school. The school has been designated as a model school by the municipal government since 1991, and the school has exchange programs with foreign schools in other countries. For example, Iizuka high school in Fukuoka, Japan, is a sister school, to which

students are sent every September in an exchange program. On the bulletin board at the entrance to the school, several notices are put up on the board. Notices on environmental issues are in the hall on the 2nd floor, and newspaper clippings as well as the reports on environmental activities are put up together on the notice board. The school is well equipped with the necessary facilities and equipment for the students. In particular, the rooms or laboratories for experiments on chemistry and biology, and computer rooms are fully equipped. The government-led education committee gives official notice to primary, middle, and high schools on environmental education. In general, the schools follow this notification (circular notes) and teach students environmental education programs; since the 16th middle school at Dalian is designated as a model school, several environmental protection activity programs as extracurricular activities in addition to the regular textbook education are offered.

(1) Environmental education is taken as a subject for credit, in regular subjects such as geography; the textbook for geography for middle school students provides descriptions on environmental education in about 10 pages, and in 5 pages for the textbooks of biology for high school students (Chapter 4, Environmental Protection). In high school, the subject of environmental protection is not compulsory but an option, and those who take this subject will use the materials describing "environmental protection" compiled by the Education Committee at Liaoning, besides the regular textbook. In addition, the high school students will use videotapes for environmental education, but there are not enough videotapes for each individual student's use. The students discuss environmental issues in the class and talk about the subject of the environment at meetings. In order to make the meeting successful, they have to make the necessary investigations and perform practical study in town before attending the meeting. To the same object, the essay contest is held under the theme of the environment.

(2) The following are examples of extracurricular activities:

- \* The students are under the guidance of environmental education groups in which a vice principal takes on the leadership.
- \* A notice board is used for information and for mutual interests shared by the teachers and students. Both the principal and vice principal in the school put brochures on the notice board. Students are encouraged to make catchy phrases addressing environmental issues.
- \* A school public address system is used for advertisements (PR).
- \* The club activities include a group who "Read the environmental report in China".
- \* Likewise, "Protecting Green Plants" is available in the school as a club activity through which the students of one or two classes go to town every week for practical studies such as how to keep a clean social environment. They work hard making the look of the town beautiful rather than on campaigns to beautify the school (a campus clean-up campaign).
- \* On World Environmental Day, on June the 5th, students make plans to hold knowledge, scripts, and essay contests. All the students in school take part in these contests, and they work by themselves on the planning and evaluation of the contests.
- \* The principal of the school makes a progress report on environmental education and the school campus activities in the Liaoning Environmental Education Committee meeting every year.

#### **2.3.4 High School Education**

Pollution problems are not intensively studied in the curriculum for middle schools or lower levels, but in high school education the pollution issues are a compulsory subject in "Chemistry".

#### **2.3.5 University Education**

The Institute of Urban Environment is set up in the Universities of Education in Dalian city and includes Information Science for Geography, Urban Environmental Science and the Institute of Oceanography which is also taught in the Department for Environmental Education. The faculty consists of professors (8), associate professors (8), assistant professors (12), research associates (5), and technicians (9) and the number of students is 90 for each grade. Most of the graduates become high school teachers and others will work for government organizations, junior colleges, and businesses.



Chemical Engineering and the Processing Institute for the Environment are affiliated to Dalian Science and Technology University. This Institute has professors (2), associate professors (6), assistant professors (6), research associates (5), and technicians (5). The number of students for admission is 30 every year, and the graduates who will work for government organizations is 20%, and for businesses 60%, and for university and research institutes 20%.

Other Universities or Institutes in Dalian where research on environmental issues is carried out in their laboratories are Dalian Railroad University, Dalian Fisheries College, and Dalian Medical College. These Universities or Institutes have training programs for those outside of the university, i.e. for corporate workers. They also have exchange programs and research collaboration is contracted with Japanese universities such as Tokyo University, Saitama University, Kyushu University, and also in other countries such as Britain, Germany and Australia.

#### 2.4 The Institute for Education

The Institute for Education is a training organization for school teachers. The teachers are not government workers. The teachers belong to a general labor union, which is a public association. The Education Committee holds a meeting called a "Training Institute" once a month for an interchange between teachers and to keep communication with the Education Committee, and through this meeting with exchange programs, guidance is given regarding the overall educational materials used by the teachers. During the summer vacation, education and training programs for teachers are offered. Textbooks are used in the education and training programs. The Education Committee is the decision making authority in the classroom for environmental education throughout the grades and their decisions are reflected in the educational textbooks for teachers. Moreover, the Education College provides leadership for the curriculum and gives guidance to teachers. In the past, the primary, middle, and high school teachers were trained by the Education College so that they could teach environmental protection issues.

#### 2.5 Dalian Women's Association

Dalian Women's Association is a non-official, non-governmental, private organization with approximately 2,600,000 female members (about half the population in Dalian city). The public relations section in Dalian Women's Association is responsible for the organization's education and publicity, and an executive section in the Association exists for planning detailed activities. Until women joined in environmental protection activities provided under the "Chinese Environmental Protection Century Action" in 1990, they had not paid much attention to local environmental issues. However, currently, women are coping with environmental problems every year under a specific theme.

The Dalian Women's Association uses their concepts and activities, through their numbers, to promote environmentally-healthy measures. In addition, 53% of housewives live by dint of careful housekeeping and manage to become clever consumers, paying careful attention to and upholding the following:

- \* The behavior of housewives affects their husband and children. It is reported that 80% of children are affected by their mothers through discipline at home. In other words, children are what their mothers make them, for the most part.
- \* Environmental education is also to be given at home.
- \* Mothers are the first teachers for their children. Mothers teach children how to throw away garbage, for example.
- \* It is the social responsibility of each individual to raise his/her own consciousness regarding their social environment.
- \* The beginning of any environmental education includes asking the following questions; namely, "What are the environmental measures to be taken for each individual?" "Are only policy-makers responsible for environmental improvement?" Of course, the answer is no. All people should "waste not," "want not". Individual power is small, but the citizenry together can make a difference in preserving the environmental beauty of Dalian and other cities in China.

## **2.6 The Dalian Zhongshan District People's Government Guilin Highway Office**

The Highway Office is a government organization inhabitants can access. This Highway Office is responsible for the management of about 8,600 households within a population of about 23,000. The number of the office staff is about 30. The inhabitants have a Jumin Committee, (a so-called residents' association), which has the role of directly organizing and undertaking the task of environmental information and education to the inhabitants in association with The Highway Office. The major roles of the Committee include the management and education of its members, and they offer governmental services to community members. The committee also engages in negotiations with the local government regarding the members' problems and desires. For example, The Highway Office is responsible for senior people who live alone, and are also responsible for the children of divorced parents. The Highway Office consists of four sections: the political party committee, the local government, the urban sanitary construction department, and the general affairs section. The local government is the section in charge of family registration, etc. The urban sanitary construction department is in charge of environmental issues dealing mainly with the maintenance management of its facilities, of improving the environment in general, and of keeping the environment. Management of lawns and flowers, tree planting, and the education of inhabitants are also tasks for the department. As for environmental education, officers from the environmental protection department are sent to give lectures at parks or in meeting rooms usually used for club activities. The committee members learn from the lecturers sent from The Highway Office and education is the responsibility of the inhabitants' committee. The contents of the lectures are drawn from current issues regarding mostly air condition and noise, and sometimes measurements of noise and black smoke are given and discussed. Study meetings for reading environmental newspapers were held in the past, but with the recent enhancement of the environmental consciousness of the inhabitants, this study meeting was suspended. Environmental management has been strict and the inhabitants are obligated to throw domestic waste in a bag and to put it at a specified site. At present, 50% cooperation has been achieved, but this figure needs to be 100% to be finally achieved. Since there is still much to be desired in the differentiation of solid waste from water, differentiated disposal issues are future problems now under consideration. Regarding environmental problems, the officers are fully aware of the necessity for improvement and management of differentiated waste collection, chemical pollution to foods, and air pollution (black smoke emerging from buildings due to heating in winter).

## **2.7 The Inhabitants Committee**

The Inhabitants Committee is a self-governing organization for inhabitants and there are 17 committees under the management districts of the Guilin Highway Office. Five full-time members are elected by vote in each committee. Most of the full-time members are retired. The Inhabitants Committee helps both the inhabitants and the staff of The Highway Office, and they are also helpful in dealing with the daily life of the inhabitants, for example, in providing haircuts and bicycle repairs, etc. Likewise, they are involved in environmental education and environmental protection activities organized by the community-based groups linked with the policy of The Highway Office; for example, the trimming of lawns, garbage management, and collection of insecticide (spray), which are the activities familiar to the inhabitants. Apart from these activities provided by the groups, other committees called the "Boys and Girls Clubs" and the "Senior People's Committee" also work and study environmental protection issues.

## **2.8 Corporate Environmental Education in Businesses**

Two types of corporate education exist: (1) environmental education offered by municipal departments of environmental protection or by an affiliated organization, and (2) environmental education given to the employees by their own methods introduced in the companies.

### **2.8.1 Environmental Advertisement Education by the Municipal Environmental Protection Department**

The results of answers from respondents to the questionnaires sent to twenty major companies in Dalian city show that environmental education by the Municipal Environmental Department is not

diverse, and is given almost in the same manner. In other words, it is a uniform education. The following are the standards of such education:

- \* On regular event days, such as "World Globe Day" (on April the 22nd) and "World Environment Day" (on June the 5th), circulars are distributed from the Environmental Protection Department. According to these circulars, information is provided by a company public address system, by blackboard notices, in newspapers or through lectures, or by a variety of entertaining events such as quiz program shows, which will enhance the environmental consciousness of the people.
- \* Middle managers in business companies and the persons responsible for environmental protection measures take lectures on law and the regulatory system as well as government policy every year on a regular or irregular basis.
- \* A variety of documents on environmental protection are distributed in a timely manner when necessary, and subscriptions to "Regulations on Environmental Protection", "an Almanac of the Environment", "the Journal of Environmental Protection", and "the Environmental Newspaper in China" are recommended for study.
- \* Analytical engineers will take business education and job training given by the Observation Center from experts sent from the Department. Some companies, if not all, ask for lecturers from related sections in the Environmental Protection Department.

### 2.8.2 Environmental Advertisement and Educational Activities in the Corporate Company

Based on the results of an investigation by questionnaire, the author found that differences in the contents of education and methods given by the corporation itself derives from the category of business, but that the essence of information on the environment is common to most of the companies, which shows that administrative management by the government works well. The following are the advertisements and education activities shared by corporate companies:

- \* New employees need to take lectures upon their entrance into the company. After taking lectures, examinations are given to them for selection, and those who passed the examinations are allowed to receive jobs offered by the company.
- \* A Company Public Address System, the Blackboard Newspaper, quiz shows, and catchwords put on the notice board are used for advertisement and for the enhancement of consciousness regarding the environment.
- \* PR for the awareness of common sense on environmental protection issues.
- \* Setting up the Environmental Protection Committee in the company: a meeting is held on a regular basis for the employees working in the Production Department to test their knowledge acquired regarding environmental protection.

Some companies need statistical management for their own environmental pollution data. In special cases, with certain companies, the presentation and evaluation of research results on environmental protection are used to enhance environmental consciousness. Among the companies that the author visited for investigation, a few companies have taken an interest in ISO14000 (International Synoptic Code). Certain foreign-funded companies have already taken the certificate of the ISO14000, but this issue remains a subject for future discussion.

## 3 Education for the Personnel in the Environmental Protection Agency and its Affiliates

Questionnaires were sent to ten organizations in total, i.e., the branches of the Environmental Protection Agency and its affiliates to investigate the educational status of the staff. The author also investigated how many of the staff had acquired government certification. The following are the contents of the education:

- \* Technical education is as follows: observation technique, observation theory, measurement methods, science lectures, environmental evaluation, and air pollution, etc.
- \* Computer education (these curriculum is shared by each department)
- \* Legal education
- \* Language education
- \* Economics education

As for qualification status, the appropriate person is put in the appropriate place, and senior process engineers, process engineers, and assistant process engineers are used. Each department has a group of high-level engineers. Other positions are also used, such as "environmental auditors", who have the right to enter the company without permission for inspection and observation management. In addition, qualified person(s) with certificates of "quality testing for environmental matters" are at the branch office or in the Observation Center and engage in examinations of analytical data which must also be legally acceptable.

#### 4 The Effects of Environmental Educational Activities

Investigation revealed that the citizen's environmental consciousness was enhanced by the introduction of the environmental educational system in Dalian. Also, it was found that environmental education became popular in schools in Dalian. Garbage became differentiated for disposal, and other examples of environmental consciousness were conspicuous such as: no waste of energy, joining the tree-planting campaign, no deforestation, lawns were taken care of, no garbage was thrown into rivers, and no reckless hunting occurred. In the author's opinion, during the past twelve years, Dalian has been worthy of being chosen as one of the environmentally-acceptable model cities every year and should continued to be chosen.

[the author assumes that enthusiastic education was intensively offered to the departments who returned our questionnaire for reply].

#### 5 Discussions

The results of the investigations so far conducted have shown that environmental education and environmental protection activities are both successful in each department and among individual groups of people as shown in the following improvements:

- \* Well-equipped facilities (for the use of videotape recording) at the Environmental Information Center

The Educational Center for Environmental Information has the important role of providing environmental information as well as for providing facilities for videotape recording, apparatus for environmental measurements used by trainees, and environmental educational books and magazines for all interested.

- \* Education of pollution protection technology for corporate employees in action

Planning in the Center is important for learning how to cope with unpredictable accidents, and education and training should be provided for company employees who take a leadership position whenever unpredictable accidents occur.

- \* Environmental management technique (ISO14000) Education

The reports from specialists describe China as being able to achieve environmental standards for a short period, but the reports also show that keeping the standards appears impossible for the long-term. Environmental policy needs to acquire the ISO14000 (International Synoptic Code). Among the companies that the author investigated, very few companies have acquired the International Synoptic Code (ISO). The author's investigations have also shown that ISO requires huge manpower and a large outlet of money for its maintenance. Once acquired, a regular inspection has to be given and if something inappropriate is found within the company, such as under-achievement and insufficient promotions that are necessary to maintain the quality of the company, the accreditation of the ISO may be cancelled. The cancellation of the ISO may provide considerable inconvenience and damage to the company. One manager told the author that for a specific company, the damage of this kind would represent the loss of recurring profit(s). In the future, both the managers and employees in the company will learn management techniques regarding the environment. In particular, the managers and employees should learn more about the "ISO14000 Plan"; in particular, the sections labeled, "plan", "Do", and "Check and Act", and should review these acts in a repetitive manner. Hopefully this will be a first chance for human beings to harmonize with nature and make persistent advanced developments in society.

\* Video Equipment for environmental education and full texts for the use of primary, middle, and high school students

It is clear that environmental education for students in primary, middle, and high schools is important, and therefore, the materials for students' use should be carefully prepared both in terms of content and materials. Also, models and scientific appliances for display are necessary for the students to understand how to care for the environment intuitively.

\* Introduction of Systematic Environmental education at Schools

General education for adults, job education for workers, special education for undergraduates and graduate students at universities and colleges are relatively well given in Dalian. However, education in Dalian has not been penetrated into the schools located in agricultural and rural districts.

\* Planning to promote people with special talents or skills

For the realization of the construction of Dalian environmental model districts, it is important to promote people who have talents and expertise so that they can manage and conduct effective measures through their expertise and positions. The target persons are: in administration offices, senior managers, inspection and monitoring engineers, coordinators for The Highway Office, and environmental education staff; in factories, senior managers, environmental protection managers; in citizenry, environmentally-literate persons, environmental protection managers in community-based inhabitants groups; people from the Women's Association and Young Men's Associations. Action plans are made up first and according to this plan, preparation of educational materials, arrangement of teachers, a qualification system, and financial assurance should be considered. The plans are still preliminary, however, because of serious financial problems.

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## 中国の大連における環境教育の特徴

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要約：中国では経済の発展や庶民の生活の向上に伴い、大量消費、大量廃棄、森林伐採、動物の乱獲、産業廃棄物の無処理排出、工場からの排煙、廃水などにより、自然環境破壊や生活環境への弊害が生じてきた。その結果、中国では環境問題を解決するためには、従来型の処理対策だけではなく、問題の発生を防ぐ国民的努力が必要であるとの認識が高まりつつある。中国政府は環境知識と環境意識の向上に関する教育の必要性を認識し、90年代から環境教育を本格的に始めた。大連市は1990年に「大連市環境モデル地域」建設プロジェクトの環境改善計画を立ちあげ、その一環として環境教育を推進している。国から環境モデル都市に指定された大連市が、環境教育を取り入れたのは中国においては比較的早かった。大連市のあらゆる分野及び各層の環境教育の特徴について調査し、問題点を整理し、さらに今後の課題についても述べた。

キーワード：特徴、大連、環境教育