

# Practical Environmental Education on Kyoto Koka Women's College Department of Contemporary Life Design

— 3rd Report, Environmental Education for Elementally School Students by  
Women's College Students —

Hiroki Takano, Hideyuki Oshima, Chie Isomichi, Fumiko Mimasa

## Abstract

Greening activities, such as Green wall, flower bed maintenance, etc. are promoted at many elementary schools now. Although greening activities may be pleasant for elementary school students, probably, few children can answer the questions correctly; why greening is needed, and what kind of benefits they have. This project is aimed to help these elementary students to cultivate an environmentally-conscious mind (eco-mind) by having them practice greening activities and study the present condition of the earth and the meaning of greening at the same time. The students of Kyoto Koka Women's University took the lead in giving to about 600 school children of the elementary schools and the children's halls around the university, lessons, picture-book reading on environmental issues, and support for greening activities. As a result, not only the pleasure of greening activities but the importance of those activities was able to be taught to the elementary school students. Furthermore, the experience was precious also to the students who offered environmental education to the elementary school students.

## I Introduction

Abnormal weather, such as an intense drought and a hurricane, the rising interface level. due to the thawing in the polar region has been occurring all over the world. It is suggested that these are caused by the global warming because of the rising carbon dioxide concentration in the atmosphere [1–3]. It is estimated that the average global temperature will rise by about 5°C by 2100 because of human beings' consumption of a huge amount of energy for production and transportation activities [4–6]. By the way, the Eastern Japan Pacific Coast Earthquake which occurred on March 11, 2011 gave the good opportunity to consider energy problems. In the energy sources of Japan, the thermal power stations of fossil fuels account for 60%, and the nuclear power stations account for 30%. The rest are from

recyclable energies, such as hydroelectric power and wind power. Nuclear power plants discharge an extremely low amount of carbon dioxide. Therefore, nuclear power generation has drawn attention as an effective energy source from a viewpoint of global warming prevention. However, the nuclear accident caused by the Eastern Japan Pacific Coast Earthquake brought us serious problems. In this context, the development of a new recyclable energy is an urgent need for Japan, which has been dependent on nuclear power generation. However, as mentioned above, the power from recyclable energy is about 10%, which is not sufficient to fulfill the electricity demand of Japan. Therefore, now we cannot but rely on the thermal power by combustion of fossil fuels.

Now, as well known, the carbon dioxide concentration of the earth changes through the year [7]. This is because photosynthesis becomes more activated in summer when plants grow well than in winter. Thus,

plant photosynthesis influences the mean global carbon dioxide concentration. In recent years, the number of plants is decreasing by deforestation or slash - and - burn agriculture, and the increasing of the number of plants is one of the effective means to lower the mean global carbon dioxide concentration. From this perspective, we, Kyoto Koka Women's University environmental volunteer circle "Green Keeper," has carried out many greening activities so far. one of the greening project was supported by the Commemorative Foundation for the International Garden and Greenery Exposition. activities, "We love flowers and greenery! The practical environmental education for children".

## II The Commemorative Foundation for the International Garden and Greenery Exposition support project

This association was established in order to contribute to the creation of a charming affluent society by founding the International Flower and Greenery Exposition Commemoration Fund for the succession and development of its basic philosophy, and undertaking many projects for symbiosis of nature and human beings. Moreover, the open recruitment of a grant project has been carried out since 2004, for the purposes of supporting a research and development, various activities, etc. leading to the succession and development/education of the basic philosophy of the Expo, and contributing to the creation of a charming affluent society. We applied for this support project, and were selected from many applicants as a result of a very strict scrutiny. The proposed project name is "We love flowers and greenery! The practical environmental education for children." The environmental education is provided for children who bear the future of the earth through this project. In this project, the children in Ukyo Ward of Kyoto City are educated about not only greening activities but the simple question of why greening is needed, through picture-book

readings or mini-lectures.

## III Enforcement system

This project is divided roughly into the following three activities; 1. ecology class, 2. picture-book reading, and 3. greening activities. First, for 1 and 2, the female college students who studies environmental studies at the university, mainly the members of Green Keeper, and NPO Mumunoko specializing in early childhood education take the lead in teaching the meaning of greening to elementary school students. Next, for 3., Green Keeper supports the greening activities of elementary school students, taking advantage of the knowledge of the greening activities which they have experienced so far. The outline of Green Keeper and Mumunoko is shown in Fig. 1. Green Keeper is an environmental volunteer circle which performs the greening activities inside and outside the university. NPO Mumunoko go out with pleasant programs, such as puppet plays, silhouettes, shining silhouettes, etc. for performance to a nursery school/ kindergarten, an elementary school, a children's hall, welfare facilities, a place for local activities, etc. Moreover, they lectures for those concerned with children and the leaders of children facilities. The implementation organization of this project is shown in Fig. 2. The Ukyo Eco City Station in the figure is a window of the administration used as a base for supporting voluntary cleaning activities in a community, reduction/recycling activities, such as the collection of used cooking oil, wastepaper etc., consultation about trash separation, education of global warming preventions etc. They participated in this project as a coordinator with supported elementary schools and children's houses.



Fig.1 Photograph showing of typical activities of Green Keeper (a), Mumunoko (b) and Ukyo Eco City Station (c). Green Keeper is an environmental volunteer circle of Kyoto Koka Women's Univ., Mumunoko is a nonprofit organization for the purpose of childrearing support and Ukyo Eco City Station is a window of environmental administration of local autonomy.



Fig.2 The enforcement system of the proposed project, "Environmental Education for Elementally School Students by Women's College Students". This project put into effect on trinity of Green Keeper, Mumunoko and Ukyo Eco City Station with supported by Expo' 90 Foundation.

#### IV The activities in elementary schools and children's houses

In this project, lessons, picture-book reading about environmental problems, and support of greening activities were given to elementary schools and children's houses around Kyoto Koka Women's University. The list of the targeted organizations, enforcement dates, grades, the numbers of students, contents, and the provided plants and animals that were offered is shown in Table 1.

To 39 2nd graders students of Nishikyogoku

Nishi Elementary School, picture-book reading and greening support were offered, and a class was held for 51 sixth graders students on May 6, 2011 (Fig. 3). From elementary school students, there were many responses, such as "I have understood why the environment must be taken care!," "I will take good care of the environment!" etc. Before the greening activities, the flower bed was ruined, but was completed into a beautiful bed after the activities. In addition, the provided rosemarys are flowers with a comparatively long life, and are blooming during summer. Furthermore, this flower also has antimicrobial use and purifies the soil of a flower

Table 1 Enforcement schedule and contents of the proposed practical environmental education.

Organization	Enforcement day	Grade	Number	Contents			Provided plants or fishes
				Picture book	Class	Tree planting	
Nishikyogoku Nishi*	6 May, 2011	2nd 6th	39 51	○		○	Gazania, Rosemary, Camellia, Kalmia
Kadono	13 May, 2011	1st ~ 3rd	55	○		○	Spearflower, Wild strawberry, Checkers strawberry
Umedu	16 May, 2011	4th	18			○	Lady washington pelargonium, North Pole, Hydrangea
Yasui	26 May, 2011	1st ~ 3rd	43	○		○	Geranium, Marigold, Madagascar jasmine, Blueberry, Abelia
Uzumasa	13 June, 2011	1st ~ 3rd	80	○		○	Japanese morning glories, Bitter melon, Hibiscus
Koka*	16 June, 2011 23 June, 2011	4th	62	○	○	○	<u>Plants</u> Sweetflag, Water plantain, Lythrum anceps, Lysimachia fortunei, Rabbitear iris, Japanese spatterdock <u>Fishes</u> Freshwater shrimp, Medaka, Japanese bitterling Rhinogobius, Bivalve
Saiin*	4 July, 2011 26 Aug., 2011	4th	20 99		○	○	Madagascar periwinkle, Hibiscus, Marigold
Umedu Kita Umedu Kita*	14 July, 2011	1st ~ 3rd5th	50 64	○		○	Japanese morning glories, Bitter melon

\*Elementary school



Fig.3 Photograph showing of the environmental education to Nishikyogoku Nishi Elementary School students. Reading to elementary school students picture books by Mumunoko (a), classes by Kyoto Koka Univ. students (b), tree planting support by Green Keeper (c).

bed.

Picture-book reading and greening support were given to the 1st to 3rd grades of 55 Kadono Children's House students on May 13, 2011 (Fig. 4). This children's house is on the second floor of a building, and the flower bed area is very small. Therefore, the herbs which do not grow very large were offered. Since a plant which grows berries was desired, wild strawberries were offered. Although the flower bed area was very crowded because of the

greening activities in a small place, the elementary school students behaved themselves in a line for planting.

Greening support was offered to 18 4th graders students of Umedu Elementary School on May 16, 2011 (Fig.5). Since they were the cultivation committee, they were very interested in greening activities. Since the flower bed adjoined an artificial pond, it was in a state of water overflowing when the soil was cultivated. Therefore, macrophytes





Fig.4 Photograph showing of the environmental education to Kadono Children' s House students. Reading to elementary school students picture books by Mumunoko (a), tree planting support by Green Keeper (b).

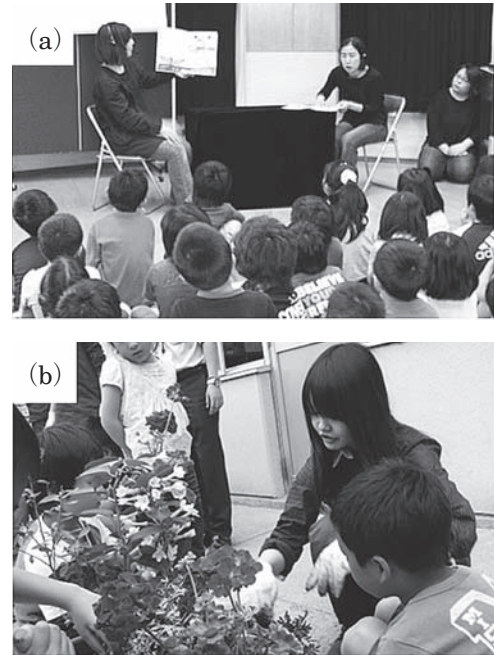


Fig.6 Photograph showing of the environmental education to Yasui Children' s House students. Reading to elementary school students picture books by Mumunoko (a), tree planting support by Green Keeper (b).

such as a Lady washington pelargonium and a North pole were planted. Since water management is difficult for a macrophyte, the school children on the cultivation committee need to check the soil condition every day. This work will also serve as a good opportunity for them to study the importance of greenery.

Picture-book reading and greening support were offered to 43 students from 1st to 3rd grades of Yasui Children's House on May 26, 2011 (Fig.6). Since there was no flower bed for greening activities in this children's house, planters were offered, where the plants were planted. In addition, these planters are



Fig.5 Photograph showing of the environmental education to Umedu elementary school students, tree planting support by Green Keeper.

eco-planters made from PET bottles or waste plastics.

Picture-book reading and greening support were offered to 80 students from the 1st to 3rd graders of Uzumasa Children's House on June 13, 2011 (Fig.7). Since this children's house wished Green wall strongly, the seedlings of bitter melons and Japanese morning glories were planted. Furthermore, the supports and the nets were set so that the grown-up plants might cover windows. A brilliant Green wall is now completed with the plants grown during summer.

Picture-book reading and a class were offered to 62 4th grade students of Koka elementary schools (Fig.8). In this class, the author explained to the elementary students about global warming, desertification, thawing in the polar region, and abnormal weather, with showing photographs. The students of Koka Elementary School usually have classes on the environment, and they were earnest in my class. Although a Biotope was originally due to be created in the elementary school playground after the

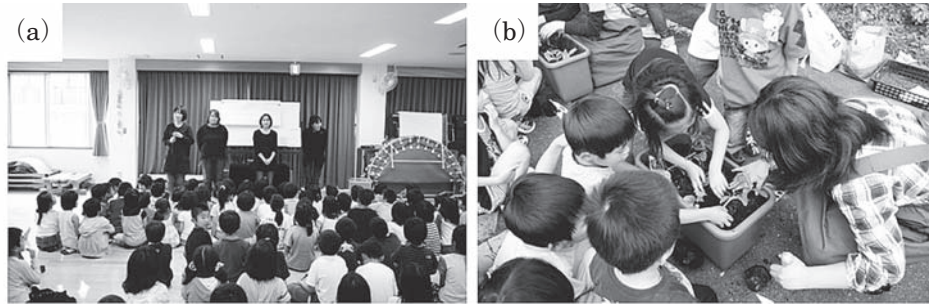


Fig.7 Photograph showing of the environmental education to Uzumasa Children' s House students. Reading to elementary school students picture books by Mumunoko (a), tree planting support by Green Keeper (b).



Fig.8 Photograph showing of the environmental education to Koka Elementary School students. Reading to elementary school students picture books by Mumunoko (a), classes by the author. (b), tree planting support by Green Keeper (c).

class, they were unable to do it because of rain. Therefore, the Biotope was built on June 23. The elementary school students are very interested in animals among environmental education themes, as mentioned below. In this Biotope, endangered species, such as a medaka and a Japanese bitterling were released as well as water plants such as a sweetflag and a water plantain. As for these fishes, the number of surviving is now decreasing sharply due to the propagation of alien species or the reduction of rice fields. The elementary school students were observing the released fish earnestly.

Greening support was offered to 20 4th grade students of Saiin Elementary School on July 4, 2011 (Fig.9). Since they were members on the cultivation committee, they

were very interested in greening activities. This elementary school regards environmental education as an important education in particular. Greenbelt is set on the roadside of the elementary school. This time, the plants were planted in this greenbelt. Moreover, the author had a class to 99 4th grade students on August 26, as requested by this elementary school. In this class, the outline of the environmental problems was explained, and the contents about animal hermaphrodite by hormone-disrupting chemicals were introduced, since the elementary school students were interested in animals in particular.

Picture-book reading and greening support were offered to 50 students from 1st to 3rd graders of



Fig.9 Photograph showing of the environmental education to Saiin Elementary School students. Classes by the author (a), tree planting support by Green Keeper (b).



Fig.10 Photograph showing of the environmental education to Umedu Kita Elementary School and Children's house students. Reading to elementary school students picture books by Mumunoko (a), classes by the author(b), tree planting support by Green Keeper (c).

Umedu Kita Children's House, and a class was held for 64 5th grade students of Umedu Kita Elementary School on July 14, 2011 (Fig. 10).

Thus, this project offered environmental education to about 600 school children of the elementary schools and the children's houses around the Kyoto Koka Women's University.

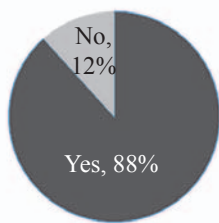
#### V Elementary students' interest in environmental problems

The aim of this project is to help elementary students to cultivate an environmentally-conscious mind (eco-mind) by having them practice greening activities and study the present condition of the earth and the meaning of greening at the same time. Although the greening activities, such as Green wall, flower bed maintenance etc., are promoted at many elementary schools now, how effective an environmental education is being performed? Here, the following questionnaire was given to the elementary students who had an environmental education (282 upper graders from the 4th to 6th grades, 178 lower graders from the 1st to 3rd grades) through this project.

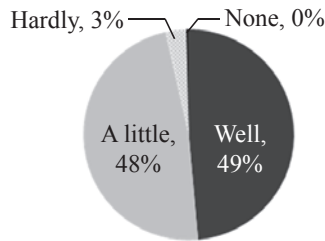
The result of the survey conducted to the upper graders of elementary schools is shown in Fig.11. To the question, "(a) Have you learned anything new about environmental problems in this class?" 88% of the students answered "Yes." This result shows that most of the students learn something new through this project. To the question "(b) Are you interested

in environmental problems, such as global warming?" 49% of the students answered "Well," 48% "A little," and only 3% "Hardly." It shows that almost all students are interested in the environmental problems. To the question "(c) Do you perform environmental activities at home, such as adjust the temperature of an air-conditioner, or erase the electric light which is not used?" 23% of the students answered "Well," 68% "A little," 7% "Hardly," and 2% "None." About 90 percent of the students are carrying out the environmental activities at home. On the other hand, probably, the students who answered "None" are influenced by their home education and their parents. To the question "(d) In the case of studying environmental problems in your school, what theme do you want to study? (multiple answers possible)" 21% of the students answered "Animal", and 20% "Life." As known from the interest in the biotope of Koka Elementary School shown in Fig. 8, it is clear that the elementary school students are very interested in life. To the question "(e) Do you want to study more about environmental problems?" 45% of the students answered "Well", and 48% "A little." This result shows that most of the students began to get interested in environmental problems through this project. To the question "(e) Do you want to study about environmental problems not only indoors but also outdoors?" (for the students who answered "Well" or "A little" to the question (e), almost of all the students answered "Yes." This result suggests

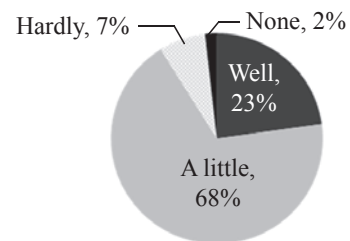




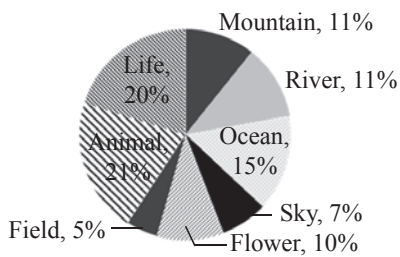
(a) Have you learned anything new about an environmental problem in this class?



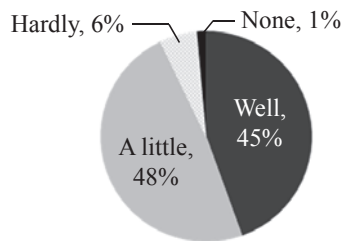
(b) Are you interested in an environmental problem such as global warming?



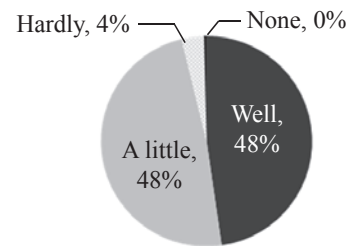
(c) Do you perform any environmental activities at home, such as adjust the temperature of an air-conditioner, or erase the electric light which is not used?



(d) In the case of studying environmental problems in your school, what theme do you want to study?



(e) Do you want to study more about environmental problems?



(f) Do you want to study about environmental problems not only indoors but also outdoors? (According to question (e), only answer "Well" or "A little" )

Fig.11 Questionnaire results of 4 ~ 6th grade 282 students in elementary school according to interest and concern about environmental problems.

that the environmental education is not brewed merely by a classroom lecture, and it is important to make the environmental education more practical.

The survey result for lower graders of elementary schools is shown in Fig.12. To the question "(a) Have you learned anything new about environmental problem in this class?" 69% of the students answered "Yes." This result shows that there were fewer students who answered "Yes," compared with the result of upper graders in Fig. 11(a). In this project, only picture-book reading was offered to the lower graders. From now on, it is necessary to include rather special contents into this picture-book reading, using simple terms. To the question "(b) Have you understood the importance of greenery?" 54% of the students answered "Well," 26% "A little," and 9% "Hardly." It seems that most of the students have understood the importance of greenery. However, it is not simple to explain the relation between photosynthesis and global warming using simple terms. As for this point, we

want to devise the contents of picture-book reading, collaborating with elementary school teachers more closely from now on. To the question "(c) Do you perform out environmental activities at home, such as adjust the temperature of an air-conditioner, or erase the electric light which is not used?" 54% of the students answered "Well," 29% "A little," 8% "Hardly," and 9% "None." About 90 percent of the student are carrying out the environmental activities at home. On the other hand, probably, the students who answered "None" are influenced by their home education and their parents. To the question "(d) Is there much nature, such as trees, rivers, etc. around your house?" 31% of the students answered "Well," and 35% "A little," 16% "Hardly," and 18% "None." The local area where this project was undertaken is in the city area crowded with many buildings. As for this question, the answer depends on which area is compared with, and the students, who have been to the rural areas where their grandparents live, might feel that there is



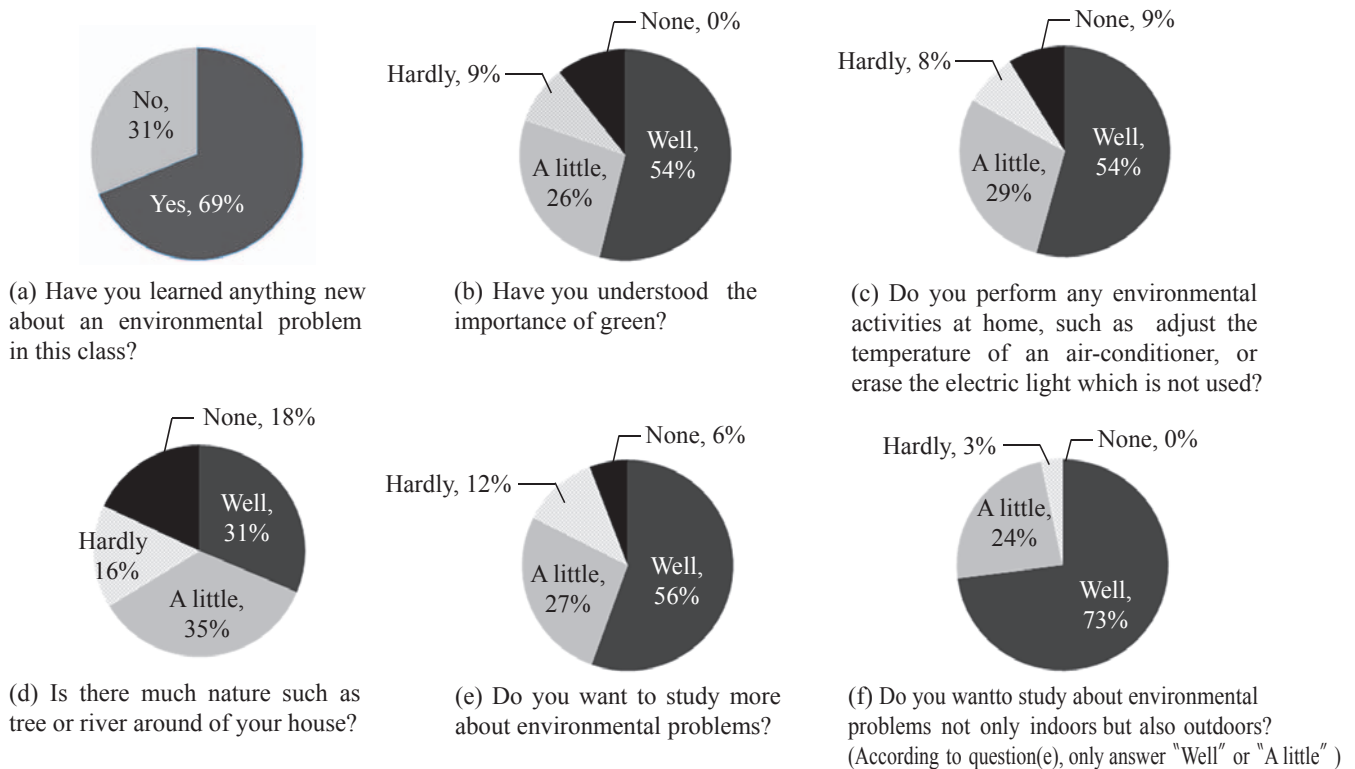


Fig.12 Questionnaire results of 1 ~ 3rd grade 178 students in elementary school according to interest and concern about environmental problems.

"Hardly" or "None" nature. It is necessary to have the students understand the true state of nature. To the question "(e) Do you want to study more about environmental problems?" 56% of the students answered "Well", and 27% "A little." This result shows that most of the students began to get interested in environmental issues through this project. To the question "(e) Do you want to study about environmental problems not only indoors but also outdoors?" (only for the students who answered "Well" or "A little" to the question (e)), 73% of the students answered "Well," and 24% "A little." There were more students who answered "Yes," compared with the result of upper graders in Fig. 11(f). This result shows that the lower graders get more interested in the environmental education. That is, it shows that it is essential for off-campus learning to be started in early grades.

## VI Summary

This project is intended to help the local elementary students to cultivate an environmentally-conscious mind (eco-mind) by having them practice greening activities and study the present condition of the earth and the meaning of greening at the same time. The students of Kyoto Koka Women's University took the lead in giving to 600 school children of the elementary schools and the children's halls around the university, lessons, picture-book reading on environmental issues, and support for greening activities. As a result, we were able to get many elementary school children to get interested in environmental issues.

Moreover, it is extremely important for the environmental activities to be persistent. In this project, not only greening activities but their meanings were deeply discussed. We can expect that school children themselves will take the initiative in continuing further activities. Moreover,

this project is unique in that it is carried out by the "women students." Especially in environmental education, the kindness and rich sentiment of women play an active role. Furthermore, many of these women students will be mothers in the future. For this reason, it is concluded that this project becomes not only the environmental education to elementary school children but precious experiences to the university students.

### Acknowledgments

This work was partially supported by The Commemorative Foundation for the International Garden and Greenery, Kyoto City Environmental Policy Bureau, Ukyo Eco City Station and Learning Community "Hikari to Hana Bigban".

### References

- [1] J. S. Sawyer, *Nature* 239, 23(1972).
- [2] J. J. Barnett, J. T. Houghton, C. G. Morgan, D. R. Pick, C. D. Rodgers, E. J. Williamson, M. J. Cross, D. Flower, G. Peckham, S. D. Smith, *Nature* 245, 141(1973).
- [3] J.T. Houghton, Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, C. K. Johnson, Cambridge Univ. Press, New York(2001).
- [4] T. M. L. Wigley, S. C. B. Raper, *Science* 293, 451(2001)
- [5] J. Reilly, P. H. Stone, C. E. Forest, M. D. Webster, H. D. Jacoby, R. G. Prinn, *Science* 293(2001).
- [6] P. A. Stott, J. A. Kettleborough, *Nature* 416, 723(2002).
- [7] Japan Meteorological Agency, Climate Change Monitoring Report(2007).