Consideration Concerning the Traditional Regional Culture and Environmental Education that Support the Conservation of Ecosystems of Lagoons around Lake Biwa (A Case Study of Lake Nishi-no-ko in Shiga Prefecture)

Ikujiro Wakai
(Osaka Sangyo University, Osaka, Japan)

This study, based on the idea that the conservation of ecosystems depends on human culture and education, considers their conservation in relation to the traditional regional culture of a community which has coexisted with lagoons, by selecting one rare lagoon called Lake Nishi-no-ko. With respect to environmental education and its significance, the author focused on three viewpoints which are considered essential concerning the use and conservation of ecosystems: material cycle, living environment and restoration of nature.
Keywords: traditional regional culture, environmental education, lagoons, ecosystems, material cycle, living environment, restoration of nature, Lake Biwa.

1. INTRODUCTION

There has long been concern about the crisis of ecosystems that is caused mainly by pressure resulting from human exploitation, and there is little prospect of their restoration. However, ecosystems are the very foundation of human survival, and due to their irreversible nature, once lost, they are irreparable. Because of such a grave situation, local communities and NPOs are continuing to make efforts on a small scale in regions where ecosystems remain throughout the world.

Japan also experienced nationwide pollution problems during the postwar high economic growth period, which accelerated a great many changes in the natural environment and caused depletion of its unique ecosystems. Some animals and plants are becoming extinct still today. However, Japan is blessed with a moderate temperature and rainfall compared with other regions on earth, and with its geographical location being in a temperate zone, the conservation and restoration of ecosystems is feasible, provided that conservation and restoration activities are continued by local people and that all the conditions are right.

Introducing as a case study, the ecosystems of Lake Nishi-no-ko, one of the scarce remaining lagoons around Japan's largest lake, Lake Biwa, this study aims to clarify the role of traditional regional culture which has supported the ecosystem of the lagoon, together with the significance of relevant environmental education.

2. OVERVIEW OF LAKE NISHI-NO-KO

In Shiga prefecture, which is located roughly in the center of Japan's main island, lies Lake Biwa, the biggest lake in Japan. It is surrounded by precipitous mountains in the west and low-lying flatland in the east, and is constricted at a point about one quarter north of the southern end, dividing it into the North Lake and South Lake. Its shape resembles the Japanese musical stringed instrument «biwa», placed upside down. From the shoreline of Lake Biwa covering an area of approximately 670 km^2 toward the inland areas, there are scattered restful lagoons called «Nai-ko».

These lagoons play an important role regarding ecology, regional communities and industries as buffering bodies of water that mediate between Lake Biwa and the rivers flowing into it. After the Second World War, the lagoons, once forty, were drained due to the priority given to increased food production, and half of them have disappeared.

Situated in Ohmi-Hachiman city, Shiga prefecture, Lake Nishi-no-ko, the subject of this study, is a lagoon created by separation from another lagoon called Iba-nai-ko, as a result of the full reclamation of Dainaka-no-ko and Azuchi-nai-ko during the pre- and post- Second World War periods. It is one of the lagoons which was not reclaimed and is 2,22 km^2 in area with an average water depth of approximately 1,5 m.

With water flowing from small rivers and its calm surface, Lake Nishi-no-ko provides an envi-

ronment for aquatic plants and waterfowl, including waterweeds and algae, as well as reeds near the shore. Having lakes and marshes that foster biodiversity, in 2008 Lake Nishi-no-ko was incorporated in the Lake Biwa Ramsar site which had been inscribed in 1993 as a registered wetland under the Ramsar Convention.

The area around Lake Nishi-no-ko features a magnificent landscape ringed by villages comprising vernacular traditional houses, the adjacent satoyama or managed woodlands or hills (as described later), and paddy fields. Retaining both such a fine natural and cultural landscape, the riverside district of Ohmi-Hachiman city including Lake Nishi-no-ko was selected as Japan's first Important Cultural Landscape in 2006.

As described above, blessed by both its natural and cultural environment, Lake Nishi-no-ko has begun to regain attention in recent years, as a regional resource in terms of the conservation of biodiversity and revitalization of regional society, which has led to the enhancement of activities among local communities concerning the restoration of nature.

3. THE NATURE AND SOCIAL FUNCTION OF LAKE NISHI-NO-KO

Lake Nishi-no-ko is located between Lake Biwa and rivers flowing into it, and has calm water surfaces with reeds growing near their shores. Accordingly, serving as egg-laying and nurturing places for fish living in Lake Biwa it has played an important role as a place to reproduce freshwater fish species and has supported the fishing industry in Lake Biwa.

In order to sustain the fishing industry in Lake Biwa, it is necessary to maintain the water quality of Lake Nishi-no-ko. The maintenance mechanisms are roughly as follows.

First, the water flow in Lake Nishi-no-ko is gentle and is retained for a long period, resulting in natural purification. Secondly, reeds growing naturally in the lake promote self-purification of the water by material cycle, through the absorption of a large amount of nitrogen and phosphorus as metabolic nutrients during their growing periods. Today the water-purifying function of reeds is being reevaluated. Lastly, shellfish in Lake Nishi-no-ko also serve a water-purification function. Although today they are decreasing due to the deterioration of water quality and accumulation of sludge on the lake bed, they used to be plentiful and contributed to purification of the water.

It can be said that these hydrological characteristics and ecological varieties in Lake Nishi-no-ko are important natural factors for the fishing industry in Lake Biwa.

On the other hand, the relationship between Lake Nishi-no-ko and society is as follows.

Once, the water quality of Lake Nishi-no-ko was so high that it was possible to cultivate freshwater pearls there. However, in the period of high economic growth that began in the 1950's, domestic wastewater containing synthetic detergents and industrial drainage flowed into the lake, resulting in deterioration of its water quality as well as that of other lagoons and Lake Biwa, and the decline of the pearl industry.

Reeds growing at the water's edge are called «Goshu (the old name of the region) reed» and are used to manufacture household items and furniture such as standing screens and sliding screen doors which are suitable for the Japanese way of living in the hot and humid climate. The reed industry has declined in recent years owing to a decrease in the growing locations, difficulties in cultivation and finding successors, as well as high costs.

4. CONSERVATION OF THE ECOSYSTEM, TRADITIONAL REGIONAL CULTURE AND ENVIRONMENTAL EDUCATION

In lagoon communities consisting of numerous towns and villages facing Lake Nishi-no-ko, a unique traditional regional culture has been fostered in association with the conservation of its ecosystem, life and industry, of which some have been lost and others handed down. Here, the author considers the significance of the principal traditional regional culture which directly and indirectly relates to conservation of the ecosystem of Lake Nishi-no-ko and its vicinity, as well as its environmental education, from the viewpoint of intergenerational environmental education.

(1) Environmental education concerning material cycle through the use of algae and mud.

Algae breeds in Lake Nishi-no-ko as in other lakes. In the old days when agriculture was the main industry, people collected algae by boat, and scattered it on their fields as organic fertilizer. They also collected mud that had accumulated on the lake bed and creeks, in the form of sediment resulting from soil, sand and other floating substances which were carried by rivers that flow into the lake and sank over time. They used such organic mud on the fields as fertilizer just like the algae, making the agricultural land more fertile and thereby contributing to higher crop yields. At the same time, this dredging of Lake Nishi-no-ko through the collection of algae and mud had the effect of purifying the water quality, thus contributing to the conservation of ecosystems. Today, these activities are no longer practiced as natural organic fertilizers and mud have been replaced by chemical fertilizers.

From the viewpoint of environmental education, such traditional regional culture can be regarded as having been a way of education concerning the correlation between the material cycle centered on Lake Nishi-no-ko and local agriculture in the course of such cycle that was given by one generation to the next through the experience of maintaining the aquatic environment.

(2) Environmental education concerning the living environment through the use of reeds

Reeds which grow gregariously at the water's edge of Lake Nishi-no-ko consume a large amount of dissolved matter in the lake, as they require rich nutrients during their growing season in the spring, while as they die and decompose in the autumn, their nutrients dissolve into the lake water, causing its quality to decline. Therefore following the harvesting of some reeds, the remainder are burned to produce healthy reeds the following year. The reeds thus harvested are strong natural materials and are used for household items such as standing screens and sliding screen doors as mentioned before. They provide comfort during the hot and humid Japanese summer, by improving ventilation in houses. In recent years, an eco-friendly life style using such items made with reeds has been regaining attention.

Also used as summer furniture and to block direct summer sunlight, the reed is one of the educational tools one can find in the living environment that allows people to experience its association with conservation of the ecosystem.

(3) Environmental education concerning the restoration of nature through the use of firewood

There are some villages facing Lake Nishi-no-ko, and adjacent to the foot of small hills called «satoyama». Satoyama is a community green space usually comprising a natural woodland, copse or hill and is close to a town or village, as people gather such daily necessities as firewood and mushrooms from it. In brief, it is a natural space where people and nature coexist. In the old days, people cut suitable trees of satoyama only in the amount required for their living and only from the area designated for a given time, so that new shoots would grow from the stumps and produce trees again for logging in the future. This represents the sustainable use of satoyama. Today, while many satoyama are abandoned as less attention is paid to their conservation and ecosystem due to the replacement of firewood by natural gas and electric energy, some are used as sites for environmental education.

Villagers used to enter satoyama and benefit from them as a way of obtaining part of their daily supplies. Through such conduct, they taught succeeding generations that the uninterrupted restoration of nature can be continued as long as the growth and management of ecosystems are carried out correctly, that is to say, that intergenerational environmental education has been practiced. Today however, environmental education concerning the conservation of satoyama ecosystems is being actively carried out by non-profit organizations and other interested volunteers and supporters.

5. CONCLUSION

In this study, the correlation between the conservation of ecosystems, traditional regional cultures and environmental education, was considered by selecting Lake Nishi-no-ko as the subject. The author stresses that, although there are various methods of environmental education, it is important to learn through experience in actual situations. This is because one will comprehend the interdependence between the ecosystem and traditional regional culture, based upon the experience of directly perceiving the mechanism

and changes of ecosystems in real-life. The author also believes that an understanding of the conservation of ecosystems and traditional regional culture will lead to new revelations, providing environmental education that cultivates their harmonious co-existence in a new way.

As Japanese environmental education today is still at the stage of research and development in pursuit of a comprehensive systemization, the author will continue in his commitment to contribute to the establishment of an academic system for environmental education which emphasizes the correlation between the conservation of ecosystems and traditional regional culture, through practical environmental education at both his university and relevant sites.

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РАССМОТРЕНИЕ ВОПРОСА О ТРАДИЦИОННОЙ РЕГИОНАЛЬНОЙ КУЛЬТУРЕ И ЭКОЛОГИЧЕСКОМ ОБРАЗОВАНИИ, СПОСОБСТВУЮЩИХ СОХРАНЕНИЮ ЭКОСИСТЕМ ЛАГУН ВОКРУГ ОЗЕРА БИВА (НА ПРИМЕРЕ ОЗЕРА НИШИ-НО-КО В ПРЕФЕКТУРЕ СИГА)

Икужиро Вакаи

(Сангьо университет Осаки, Осака, Япония)

Данное исследование, основанное на идее о том, что сохранение экосистем зависит от человеческой культуры и образования, рассматривает охрану природы в связи с традиционной региональной культурой сообщества, которая сосуществовала с лагунами, на примере одной редкой лагуны под названием озеро Ниши-но-ко. Принимая во внимание образование в области окружающей среды и его значение, автор сосредоточил свое внимание на трех точках зрения, считающихся основными в отношении использования и сохранения экосистем: круговорот веществ, сфера жизнедеятельности, а также восстановление природы.

Ключевые слова: традиционная региональная культура, экологическое образование, лагуны, экосистемы, цикл веществ, сфера жизнедеятельности, восстановление природы, озеро Бива.