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Lake Biwa in Japan – Conflicts between tourism and nature

Hiroji Fushimi

Lake Biwa is by far the largest of Japanese lakes as well as the most important freshwater resource in the country. The lake is located in Shiga Prefecture nearly at the center of Japan (Figure 1). Lake Biwa measures 64 km along its longitudinal axis with a maximum width of 23 km. The area of the lake is 674 km². The main basin or Northern Lake is large and deep with the maximum depth of 104 m and average depth of 44 m, while the smaller sub-basin or Southern Lake is shallow (average depth only 4 m) and suffers from progressive eutrophication owing to the urbanization of its surrounding areas.

Lake Biwa and Lake Constance have several features in common. The two lakes have similar size and are both fairly deep. Lake Constance is also comparable with Lake Biwa in its physiographic structure comprising a deep main basin (Upper Lake) and a shallow more eutrophic sub-basin (Lower Lake).

Both lakes are the very important source of tap water to nearby urban and industrialized cities. Lake Constance supplies water to about 4 million citizens of Germany, Switzerland and Austria, whereas some 13 million population in Shiga, Kyoto, Osaka and Hyogo Prefectures in Japan depends on the water supply from Lake Biwa.

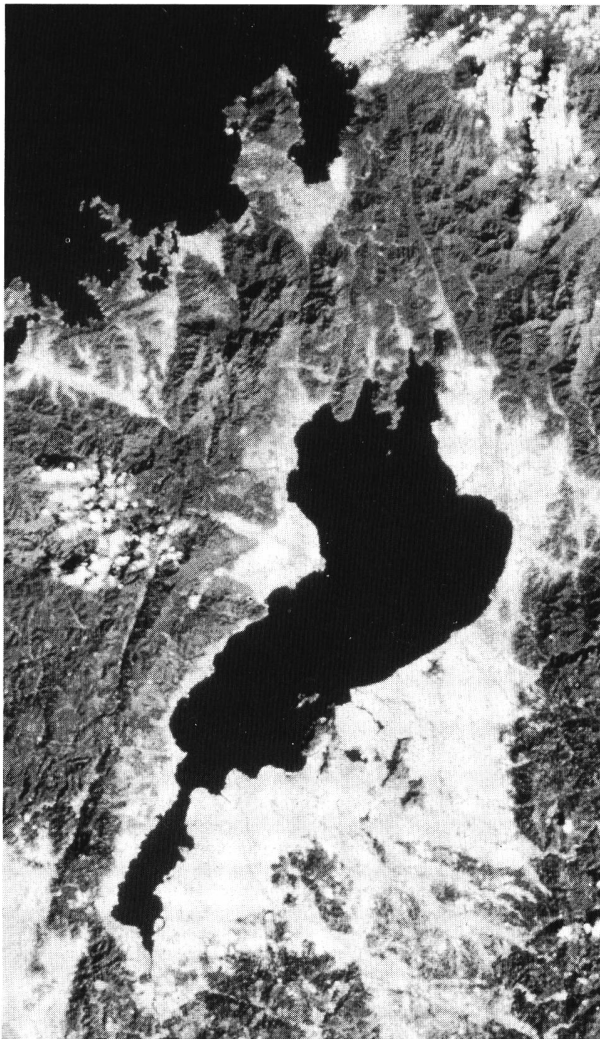


Figure 1. A satellite image of Lake Biwa.

Lake Constance is more eutrophic than Lake Biwa (Figure 2). The two lakes have suffered from the rapid progress of eutrophication of their water since the 1960's. Therefore, comparative studies on the two lakes are expected to be not only interesting from academic viewpoints but also useful for the rational management of their water resources and environments.

There are about 30 million tourists visiting Lake Biwa every year in the late 1980's. Fourteen percent of visitors came for swimming and other water sports, 7% for climbing and hiking, 8% for golf and tennis, 32% for temples and shrines and 39% for festivals. About one third of some 30 million tourists visiting Shiga Prefecture annually aim at visiting those excellent cultural treasures. Visitors for water sports accounted for only 14% in 1988, but are increasing rapidly in number. 32% of the annual tourist number came in spring, 33% in summer, 23% in autumn, and 21% in winter. This is a promising statistics for the tourism industry, since at least 6 million people enjoy visiting Shiga Prefecture in every season.

The shore management in Lake Biwa is largely based on two kinds of government policies.

The first is the Lake Biwa Comprehensive Development Project, which is here abbreviated by LBCDP. The LBCDP aims at the water resource development to substantially increase the amount of water supply from the lake to downstream industrial cities on one hand, and the flood control and the water quality conservation on the other.

For the first purpose, the range of lake water level fluctuation has to be widened considerably. To cope with the expected new situation and also for preventing the submergence of low coastal plains at the time of floods, a high embankment (top height 2.6 m above the mean lake water level) is being constructed along the shorelines. This resulted in the devastation of an extensive area of littoral wetland vegetation.

On the other hand, the construction of sewage networks and high-grade sewage treatment plants in densely populated areas of the lake basin is expected to contribute substantially to the control of eutrophication. The impact of the LBCDP on the lake environment is therefore dual.

In the second place, the Shiga prefectural government has made the following a to c environment-oriented efforts since the start of the LBCDP.

- Purchased some areas of private land along the lakeshore for protecting important natural ecotopes and beautiful landscapes.
- Stopped foreshore land-filling except some special cases for purely public purposes.
- Specified the zoning of shorelines around Lake Biwa in three managerial categories (Figure 5).

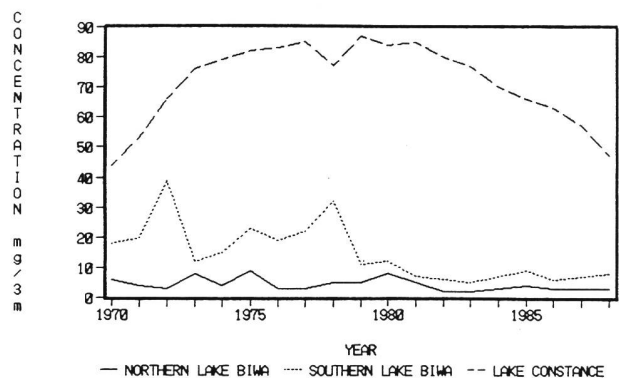


Figure 2. Annual variation of the average phosphate concentration of Lake Constance (upper) and Lake Biwa (lower).



Figure 3. Embankment along the shore of Lake Biwa.

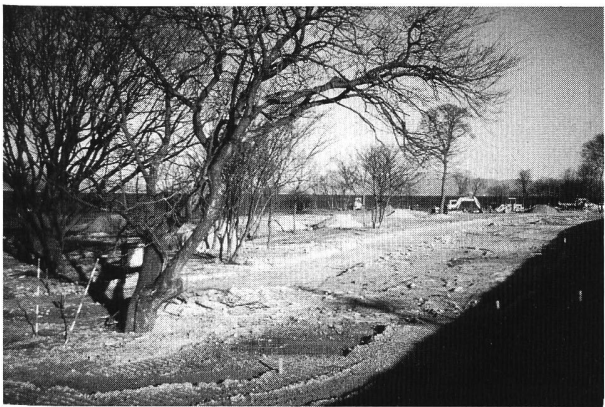


Figure 4. A lakeshore park under construction.

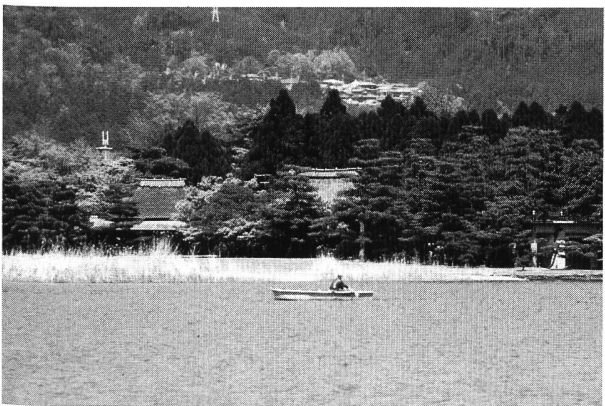


Figure 6. Traditional landscape with Japanese style houses.

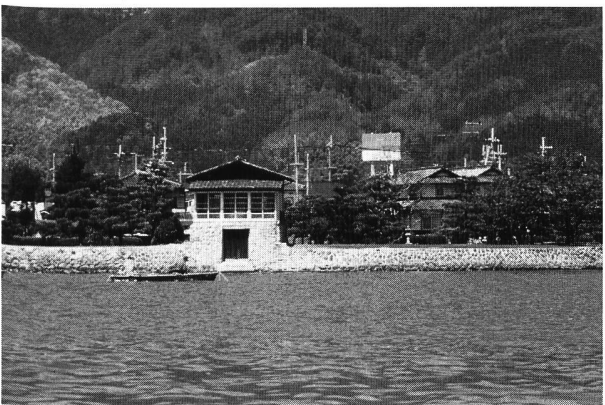


Figure 7. Traditional stone wall at the park shore.

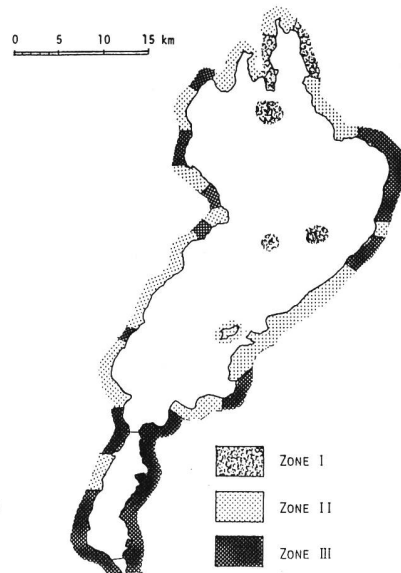


Figure 5. Zoning of the Lake Biwa shorelines.

Zone I as the strict reserve for natural shore ecotopes, Zone II as a zone where the natural landscape is basically preserved but some recreational activities are allowed, and Zone III as a zone where more or less free land uses are permitted.

The conflicts between water resource/tourism development and protection of nature appear mostly in the following three aspects:

- The increase in nutrient loads to the lake due to increased visitors.
- The destruction of shore plant communities and ecosystems with resultant losses of their biological diversity and water-cleaning functions.
- The disturbance of traditional landscapes, both natural and cultural.

In terms of the loading of phosphorous, the key substance responsible for the eutrophication of water, domestic wastewater accounted for 37% of the total load of 1500 kg/day (in 1985) and the tourists' share in the domestic load was less than 10% (Figure 4). However, the development of large-scale resorts in the near future may create substantial sources of nutrient loads to the lake, since most resorts may be located in rural areas without public sewerage system.

Even more threatening to shore vegetation is that development planners tend to thin wetland forests and scrubs to reform them into a more friendly park-like landscape. A large portion of remaining willow and alder stands are going to be disturbed in this way. Further efforts are necessary to make planners and the public to realize the value of natural shore ecotopes and their functions.

Landscape designing offers a delicate choice difficult to be agreed by everyone. Nevertheless, there should be some basic principles concerning the desirable design of lakeshore landscape. Even where artificial structures are needed to protect shorelines against flooding and erosion, they may preferably hidden behind a continuous green belt along the shore, as is carefully done here in Lake Constance, not to mention the importance of preserving shore wetlands. The view from a boat on lake surface is the face of the lake that should be kept as natural and beautiful as possible.

Even the less urbanized shores of Northern Lake are being rapidly invaded by resort hotels, restaurants, private second houses, etc. of all kinds of Japanese and western style. Traditional cultural landscapes, such as attractive stone walls

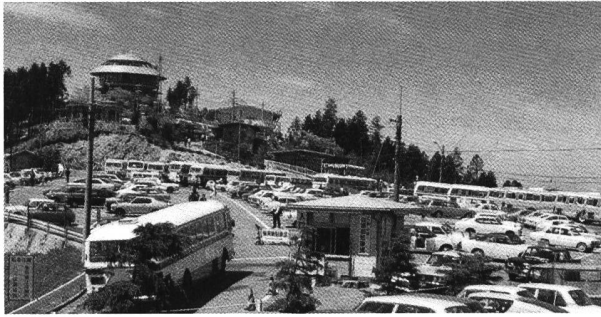


Figure 8. Cars of visitors of the Observation Tower Mt. Hiei.

protecting a shore village of purely Japanese style houses, are often carelessly replaced by modern structures. Most Japanese rural communities are still economy-oriented and development-minded, while the concern on natural beauty and harmonious landscape as common social properties is only slowly growing. Have we to wait for some time till our mentality is improved or could we manage to accelerate its progress?

Vortrag, gehalten an der gemeinsamen Wasserwirtschaftstagung in Meersburg vom 10. und 11. Mai 1990 zum Thema «Wasserwirtschaft und Erholung am Bodensee – ein Nutzungskonflikt?» Die Tagung wurde vom Wasserwirtschaftsverband Baden-Württemberg e.V. in Zusammenarbeit mit dem Österreichischen Wasserwirtschaftsverband, ÖWWV, und dem Schweizerischen Wasserwirtschaftsverband, SWV, durchgeführt.

Eine deutsche Fassung dieses Vortrages wird gleichzeitig in der Zeitschrift «Wasserwirtschaft» erscheinen.

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Neues Prüflaboratorium der Gasindustrie eingeweiht

Die Schweizerische Gasindustrie hat am 25. Mai 1990 in Schwerzenbach/ZH ein neues Prüflaboratorium eröffnet, in dem die technischen Prüfungen durchgeführt werden, die für die Zulassung von Gasgeräten erforderlich sind. Alle Gasgeräte werden einer strengen Typenprüfung unterzogen, bevor sie für den Markt zugelassen werden. Diese Aufgabe ist dem Schweizerischen Verein des Gas- und

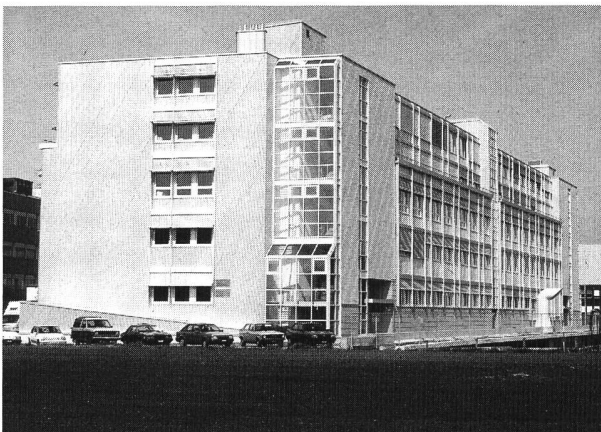


Bild 1. Das neue Prüflaboratorium der Schweizerischen Gasindustrie befindet sich im Neubau des Schwerzenbacherhofs an der Eschenstrasse 10 in Schwerzenbach, Kanton Zürich.

Wasserfachs (SVGW) übertragen, der seit den dreissiger Jahren eine entsprechende Prüfstelle betreibt. Um für die heutigen und zukünftigen Anforderungen besser gerüstet zu sein, hat der SVGW in Schwerzenbach bei Zürich ein neues Prüflaboratorium eingerichtet, das über eine moderne, dem Stand der Technik entsprechende Infrastruktur verfügt. Das Laboratorium ist insbesondere mit einer leistungsfähigen Gas-Mischanlage ausgerüstet und grosszügig dimensioniert. Dies ermöglicht eine rationellere Bearbeitung der Prüfungen, was nicht zuletzt im Interesse der Anbieter und Käufer neuentwickelter Gasapparate steht.

Prüfstellen im Europäischen Wirtschaftsraum

Die EG misst dem Prüf- und Zertifizierungswesen im Europäischen Wirtschaftsraum (EWR) eine grosse Bedeutung zu. Auch künftig sollen innerhalb des EWR nationale Prüflaboratorien fortbestehen, wobei sich deren Tätigkeit jedoch nach den einheitlichen europäischen Normen richten soll. Die Anerkennung von Laboratorien, Prüf-, Zertifizierungs- und Überwachungsstellen bedingt, dass sie sich einer regelmässigen Überprüfung ihrer fachlichen Kompetenz durch die neutrale Stelle unterziehen. Was die Schweiz betrifft, wird gegenwärtig unter der Federführung des Bundesamtes für Aussenwirtschaft die dafür notwendige Gesetzesgrundlage geschaffen.

Erdgas ist sicher

Wie Experten der Gaswirtschaft an der Medienkonferenz zur Eröffnung des Laboratoriums betonten, lässt sich das potentielle Risiko, das mit jeder Energienutzung verbunden ist, beim Erdgas dank seinen Eigenschaften und dem Einsatz moderner Technologien gut beherrschen. In Anbetracht der Länge des schweizerischen Leitungsnetzes von rund 11 000 km und des Gasendverbrauchs von über 18 Mrd. kWh ist das Risiko, Opfer eines Erdgasunfalles zu werden, mit 1:1000 000 denkbar gering. Die Hauptursache von Unfällen sind nicht technische Defekte, sondern unsachgemässe Eingriffe und Nichtbeachtung von Vorschriften. Die Gasindustrie ist durch die Anwendung moderner Technik, den Erlass von Richtlinien und Vorschriften, die Durchführung von Kontrollen, die Sanierung der Verteilnetze und die Schulung ihrer Mitarbeiter mit Erfolg bemüht, in der Erdgasversorgung einen möglichst hohen Sicherheitsstandard zu gewährleisten.

Schweizerischer Verein des Gas- und Wasserfaches, Grütlistrasse 44, CH-8002 Zürich.

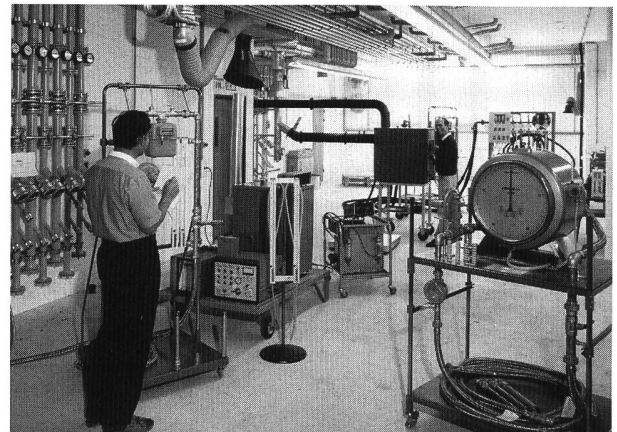


Bild 2. Das neue Prüflaboratorium der Schweizerischen Gasindustrie verfügt über leistungsfähige, dem Stand der Technik entsprechende Einrichtungen.