

Chapter 3-9

Land Use

Abstract

Land use in the Lake Biwa watershed after the end of the Second World War is characterized by the land reclamation of attached lakes in the lakeshore area, the expansion of urban land on the plains and the structural changes of agricultural land. However, it is still not fully understood to what extent these changes have affected the water quality and ecosystem of Lake Biwa.

Keywords: Land reclamation, Urbanization, Agricultural land use

1. Land Use and the Water Environment

Changes in land use that reflect the spatial distribution of the social and economic activities of humanity impact on the volume and nature of substances flowing into Lake Biwa, and, thus, planning of land use in the Lake Biwa basin must fully take into account the impact on Lake Biwa's development and conservation activities.

The Lake Biwa basin features an expansive alluvial plain surrounded by hillocks with the lake at its center. This is surrounded by an unbroken mountain range with mountains between 500 m and 1,300 m above sea level. Due to these geographical characteristics, the plains on the east shore of the lake consist mainly of agricultural and urban land while the mountains on the land beyond and the west shore of the lake is covered by forests.

2. Changes in Land Use on the Lakeshores

Because the massive alluvial plain is also an inland area surrounded by mountains, relatively speaking, much of the inland area consists of agricultural land on which rice paddies have been cultivated since ancient times. While the majority of the arable land had already been developed by the Edo period (1603 – 1868), food shortages engendered by the Second World War prompted further development in the form of reclamation of attached lakes. Although topographical maps of the 1890s during the Meiji period (1868-1912) show as many as 40 attached

lakes in the environs of Lake Biwa, land reclamation and other such projects have resulted in the disappearance of many of these bodies of water. A total area of roughly 30 km² of attached lakes has disappeared.

This area on which attached lakes once existed is no more than 1% of the Lake Biwa basin. Nevertheless, the fact that these changes took place in the transitional zone (ecotone) between the land and water that fulfills important ecological functions cannot be ignored. Moreover, subsequent projects such as reclamation and the construction of lakeshore levees have continued to transform the lakeshore area.

3. Changes in Land Use on the Plains

Changes in land use on the plains that have undoubtedly impacted on the aquatic environment are also striking. With the onset of the period of rapid economic growth in the 1960s, Shiga Prefecture's involvement in projects such as the automobile and railway transportation network development in the Kyoto-Osaka-Kobe megalopolis accelerated the processes of urbanization and industrialization, resulting in a marked transformation of agricultural land into urban land, most notably on the plains in the South Basin environs (Fig. 3-9-1). In the four major cities located in the South Basin area (Otsu City, Kusatsu City, Moriyama City and Ritto City), while the percentage of agricultural land dropped from 24% to 18% between 1976

and 2006, the percentage of urban land jumped from 9% to 16% during the same period (Fig. 3-9-2). In areas such as these, the expansion of urbanization has led to an increase in impermeable surfaces, and it is believed that this makes it easier for pollutants accumulating on road surfaces to be washed into the lake by rainfall.

Agricultural modernization also resulted in rezoning of agricultural land and the consequent establishment of a network of linear waterways. Even given that this is

a region in which there have been almost no increases or decreases in the agricultural land area, structural changes such as these to the land for agricultural use have affected the volume and nature of substances flowing into Lake Biwa.

Yoshihiro Azuma
(Lake Biwa Environmental Research Institute)

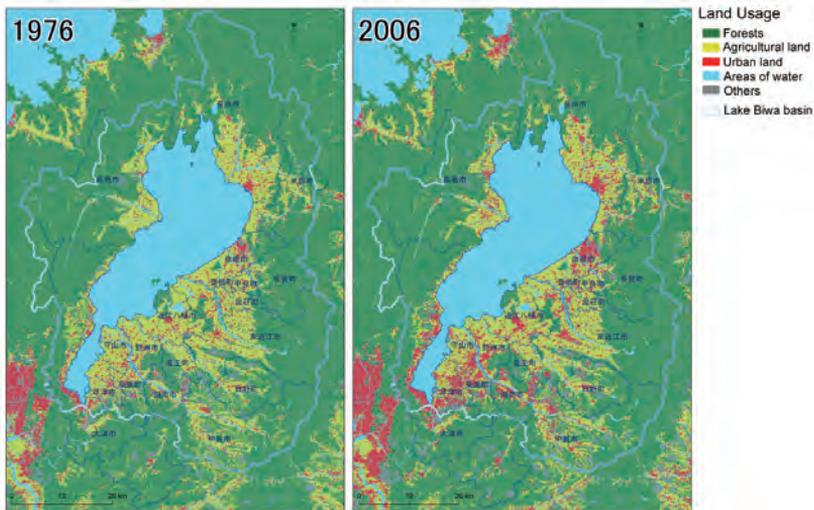


Fig. 3-9-1 Changes in land use distribution in the Lake Biwa basin
Land use data is taken from the subdivided land use mesh data of National Land Numerical Information.

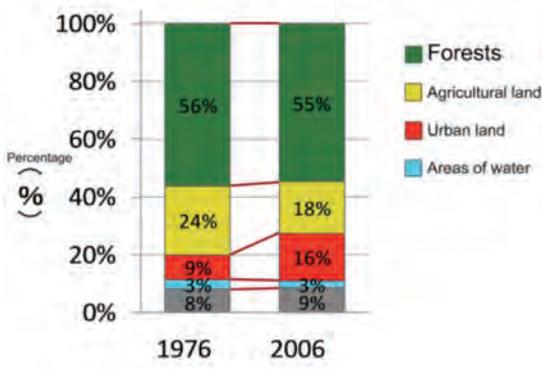


Fig. 3-9-2 Changes in the percentages of areas of land use in the four major cities (Otsu City, Kusatsu City, Moriyama City and Ritto City) in the surrounds of the South Basin