Chapter 1-4

The Lakeshore and Changes in its Topography

Abstract

While the lakeshore area offers a wide diversity of natural scenery including sandy beaches, areas of reeds and mountains, with increasing artificial modifications in recent years, as much as 37% of its area is now an artificial lakeshore, and parts of the complicated topography dotted with attached lakes have taken on a linear appearance. To conserve and restore the lakeshore ecosystem, it is important to conserve the diverse topographical environment.

Keywords: Lakeshore, Topological changes, Attached lakes

1. Changes in the Lakeshore Line

Since the beginning of the Meiji period (1868-1912), the lakeshore of Lake Biwa has undergone major changes due to measures such as the land reclamation of its attached lakes and the construction of lakeshore embankments. Topographical maps of the 1890s reveal that the lakeshore line used to be dotted with numerous attached lakes, producing an extremely complicated topography. Now, however, measures such as land reclamation of attached lakes and construction of lakeshore embankments have changed the lakeshore line into a linear formation.

2. Distribution of Lakeshore Patterns

Surveys conducted between the years 2007 and 2010 show that as much as 37% of the entire lakeshore of Lake Biwa was artificial, with sandy beaches covering 30%, mountainous areas 17% and vegetation 14% of the lakeshore area. Projects including reed cultivation, the construction of artificial sandy beaches and beach nourishment have been implemented on as much as 9% of the artificial lakeshore (Fig. 1-4-1).

Only the north and east shores of the North Basin feature mountainous terrain, while sandy beaches extend over the remainder of the shoreline. Vegetated shores are limited to shallow shores with little wind and gentle waves. On the South Basin, 73% of the shoreline is artificial with reed-cultivation areas accounting for 8% and artificial sandy beaches 1%. While prevalent on the east and south lakeshores, artificial shorelines are relatively scarce on the west side, with a mosaic of sandy beaches and vegetation remaining on the rest of the lakeshore.

Artificial shorelines are especially prominent in areas where the topography has undergone major changes, and it is fair to say that the prime cause of changes in the lake shoreline is artificial modification.

3. Changes in the Area of Lake Biwa and its Attached Lakes

In investigation of changes in Lake Biwa and the distribution of its attached lakes during the five periods following the late Meiji period (1890s) using old maps and aerial photographs shows that the surface area of the lake has decreased with the times (Fig. 1-4-2). While the North Basin (main body) has decreased in size by approximately 9.9 km^2 up to recent years, the attached lakes around the North Basin have decreased to an even greater extent by 30.9 km^2. Meanwhile, the main body of the South Basin has decreased by approximately 9.5 km^2, more or less matching the extent of decrease of the main body of the North Basin.

Although the lake surface area changes due to phenomena such as fluctuating water levels and sedimentation of rivers over prolonged periods of time, its decreases since the construction of the Seta River weir in 1905 have been largely due to the impact of artificial changes such as

lakeshore development projects including land reclamation and landfills.

4. Conservation of the Lakeshore

Such changes to the lakeshore area undoubtedly have a major impact on the habitats of wildlife living on the shores of the lake. To conserve and restore the lakeshore ecosystem, it is believed that it is important to conserve the diverse topo-graphical environment including deltas, flood plains, wetlands and attached lakes and, in the long term, to restore growth and habitats.

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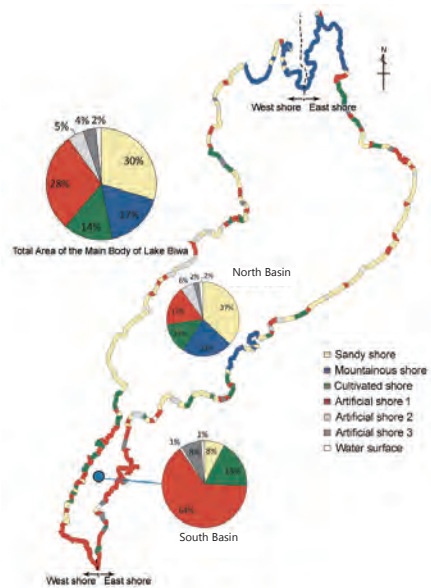(Lake Biwa Environmental Research Insti-tute)

Fig. 1-4-1 Present-day distribution of lakeshore types (2007)
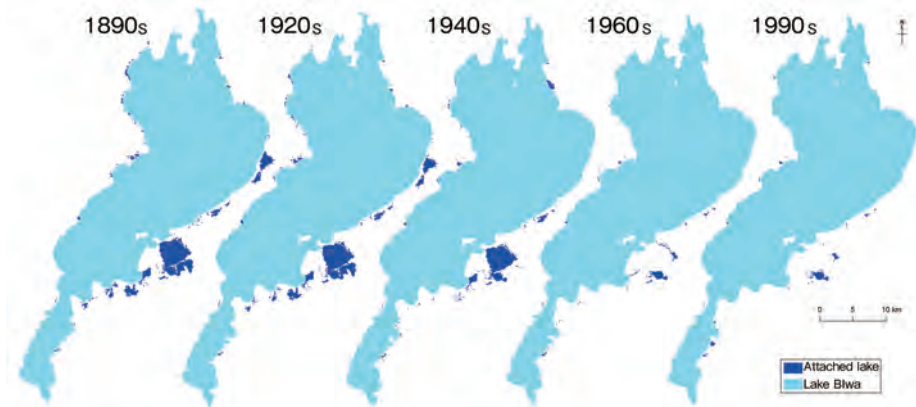

Fig. 1-4-2 Distribution of the main bodies of the lake and its attached lakes since the late Meiji period (1890s)