The Evolving History of Lake Biwa Weir

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Lake Biwa-Yodo River Region: Osaka, Kyoto, Hyogo downstream, Shiga upstream

Regional Profile: Downstream highly industrial and urban, upstream still agricultural but rapidly developing

Historical: One of the major political, economic and cultural centers in Japan, with long historical interactions

Weir History: Original one (1905) was replaced with a new one (1961), and the latter was improved with a bypass (1992)
1. AN OVERVIEW OF LAKE BIWA AND YODO RIVER BASIN

1.1. Physical and Geographical Features

- **Physical**: 670km$^2$ surface area, with a maximum depth of 104m, and a volume of 27.3 billion m$^3$.
- **Geography**: Shiga Prefecture upstream, Osaka Prefecture downstream
- **Demography**: Some 18 million population, with 14 million dependent on lake water in the Lake Biwa - Yodo River Basin.
- **History**: Centuries of conflicts, with over 120 years or so of major infrastructure interventions

1.2. Flood Control

- **Downstream**: Historically highly populated and densely inhabited
- **Upstream**: Historically agricultural and rural, but rapidly urbanizing today

1.3. Water Resources Development

- **Downstream**: Mainly drinking and industrial
- **Upstream**: Mainly agricultural but drinking and industrial growing
Methods

2. A LEGACY OF LAKE BIWA FLOOD CONTROL

2.1. Constraining Topography of Lake Biwa

2.2. Upstream–Downstream Conflicts over Dredging of Seta River
• Flood Control: Having been a major challenge for the region over centuries
• Water Resources: Emerged as a major challenge since 1960’s

3. RELATIONSHIP BETWEEN SETA RIVER DREDGING AND WEIR

3.1. Synchronizing the Weir Operation for Upstream and Downstream Needs
• Intricate operational rule
• Need for accommodating the upstream and downstream needs simultaneously

3.2. Conflicts Over Fully Closing the Seta Weir
• On the occasions of major rainfall event, the Lake Biwa water has to be kept within the lake to save the downstream from flooding
4. WATER RESOURCES AND REGIONAL DEVELOPMENT NEEDS

4.1. Lake Biwa Comprehensive Development Project (LBCDP)
- A major comprehensive national project (1972-1997, 25 years, with two extensions)
- Basically for downstream water needs, combined with enhanced flood control, together with environmental infrastructure development

4.2. Policy Framework of LBCDP
- Special law enacted to support the project, with national, prefectural and municipal policy linkages
- Ministry of Construction (then) was the lead agency at the national level.

4.3. Implementation Schemes of LBCDP
- Planned management of Lake Biwa water Level
- Seta River dredging and shoreline flood management measures
- Formulation of weir operating principles
- Development of the Yodo River Basin Management Plans
5. RESTORATION OF ECOSYSTEM INTEGRITY AND WATER QUALITY

5.1. Lake Biwa Comprehensive Conservation Plan (LBCCP)
- Emphasis on “ecosystem restoration” with broad societal participation
- Shiga Prefectural plan, with no special national
- Downstream governments reluctant to fund projects

5.2. Appraisal of First 10 Years of LBCCP (1998-2010)
- The first phase plan was a government-driven plan with inadequate societal engagement in its development and implementation
- The second phase plan (2011-2020) needs to be improved to meet the emerging needs, particularly of the changing ecosystem behavior
Conclusions

6. THE CHALLENGES AHEAD

- **LBCDP as a Background**: ameliorated the contentious relationship
  - a most dictating factor for the regional socioeconomics
  - but with enormous environmental-ecosystem implications

- **LBCCP as another Background**: the post-LBCDP sustainability framework for Shiga Prefecture
  - what about the downstream Yodo region?

- **Emerged and Emerging Frameworks for Meeting the Future Challenges**
  - Yodo River Improvement Plan, 2009
  - a new regional institutional framework: the autonomous basin policy framework (the Kansai Broader Region Collaboration Framework), 2012
  - Passing of the “Basic Law for Circulatory Management of Water”, necessitates the Biwa – Yodo region to develop a “Basic Plan for Circulatory Water Management”, 2014