

Ex-ante Evaluation

1. Name of the Project

Country: The People's Republic of China

Project: Yunnan Kunming Water Environmental Improvement Project (II)

(Loan Agreement: March 30, 2007; Loan Amount: 10,400 million yen; Borrower: The Government of the People's Republic of China)

2. Necessity and Relevance of JBIC's Assistance

In China, the sewage treatment rate in urban areas has leveled off at 48% (2005), while in rural areas sewerage facilities themselves have not spread very much. Consequently, the water pollution of rivers and contamination of seawater as typified by the frequent outbreak of red tide, have become a serious problem. In the 11th Five-Year Plan (2006–2010), to tackle the problem of water pollution, the Government of China has set the goal of raising the sewage treatment rate to 70% in all principal cities across the country. To achieve this goal, it is important to develop sewage treatment facilities. The rate of water supply in urban areas reached 89% in 2004. However, since the clean water sources are concentrated in the southwestern part of China, other areas are frequently hit by water shortages. Also, there are many cities beset with the problem of having their water supplied from deteriorating sources. In its 11th Five-Year Plan for Environmental Protection (2006–2010), the Government of China designates river basins as prioritized conservation targets with the view to raising the water quality of the designated river basins to the required level through, among other things, prevention of contamination of the said rivers, which are also important sources of drinking water, and conversion of sources of clean water. Furthermore, the Government of China promotes the creation of water-saving cities by implementing administrative measures such as regulating the amount of groundwater that can be pumped up and introducing technologies for recycling treated sewage.

In the south of Kunming City (population: approx. 5 million, or 3.6 times the population of Shiga prefecture), the capital city of Yunnan Province, lies Dianchi Lake (area: 309 km², or about half the size of Lake Biwa), a freshwater lake in the Yangtze River basin. Since the 1980s, the amount of untreated wastewater that flows into Dianchi Lake has increased year after year in tandem with the economic development in the heart of the city's urban area. In the 1990s, the water quality of Dianchi Lake deteriorated to the level unsuitable for agricultural use. Thus, in 1996, the lake was designated as a prioritized environmental protection area (3 rivers and 3 lakes).

Given the aforesaid situation, the State Environmental Protection Administration (SEPA) adopted the 10th Five-Year Plan for Environmental Protection (2001–2005) and, in addition to regarding improvement of the quality of water in Dianchi Lake as a national prioritized project, in the 10th Five-Year Plan for National Economic and Social Development (2001–2005), Yunnan Province and the Kunming Municipal People's Government plan to improve the sewage treatment capacity in the heart of the urban area (with a population of 2.81 million), which is the biggest source of water pollution for Dianchi Lake. The Kunming government has endeavored to improve the city's sewage treatment capacity by constructing a sewage treatment plant in the center of the city and by providing a network of sewage pipes. But despite these efforts, the area's sewage treatment capacity (464,000 m³/day) has not increased enough to keep up with the increase in the total volume of sewage (688,000 m³/day), with the result that untreated wastewater continues to flow into the lake. By 2015,

the projection is that the volume of sewage in the center of the urban area will increase to 900,000 m³/day. Thus, the pressing issue for the Government of China, Yunnan Province and Kunming City is to stem the flow of water contaminants into the lake by raising the area's sewage treatment capacity. The project addresses environmental conservation, one of the priority areas designated in the Economic Cooperation Program for China prepared by the Government of Japan and the Medium-Term Strategy for Overseas Economic Cooperation Operations of JBIC (FY2005–FY2007). Thus, JBIC's support for this project is highly necessary and relevant.

3. Project Objectives

The project aims to improve the sewage treatment capacity in the urban area of Kunming City, Yunnan Province, by developing sewage treatment facilities. It will thereby help improve the living conditions of its population by reducing the amount of polluted water discharged into Dianchi Lake.

4. Project Description

(1) Target Area

Kunming City, Yunan Province

(2) Project Outline

The project involves the procurement of materials and equipment, and civil works necessary for developing sewerage facilities in the aforesaid target area.

- Sewerage facilities (sewage pipes and drains, enhancement of sewage treatment plants: 5 locations, sewage pumping stations)

(3) Total Project Cost/Loan Amount

55,172 million yen (Yen Loan Amount: 10,400 million yen)

(4) Schedule

March 2007–end of December 2012 (70 months). The definition of project completion is “when the term of warranty expires.”

(5) Implementation Structure

- (a) Borrower: The Government of the People's Republic of China
- (b) Executing Agency: Kunming Municipal People's Government
- (c) Operation and Maintenance System: Kunming Dianchi Lake Investment Company, Limited

(6) Environmental and Social Consideration

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization:

This project is classified as Category B according to the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established in April, 2002). This categorization is assigned because this project does not correspond to sectors or regions described in said guidelines as being sensitive to negative

impact, because it is not deemed to have a significant harmful impact on the environment..

(iii) Environmental Permit

The Environmental Impact Assessment (EIA) report related to the project was approved by the State Environmental Protection Administration in August, 2005.

(iv) Anti-Pollution Measures

Wastewater from sewerage facilities will be treated and released into the river in a state and manner that meets the wastewater standards established in China. Thus, no significant adverse impact is foreseen. Additionally, sludge generated in sewage treatment plants will be appropriately disposed of in reclaimed repository sites.

(v) Natural Environment

The project site is not located in or around sensitive areas, such as national parks, and so adverse impact on the natural environment is assumed to be minimal.

(vi) Social Environment

The project involves land acquisition of about 35 ha and the acquisition was implemented in accordance with the domestic procedures of China. The project does not involve resident relocation.

(vii) Other/Monitoring

In the project, the Kunming Environmental Protection Bureau will monitor water quality and the like.

(b) Promotion of Poverty Reduction

None

(c) Promotion of Social Development (e.g. Gender Perspective)

None

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2004)	Target (2015, 3 years after project completion)
Population treated (10,000 persons)	197.0	315.2
Amount of wastewater treated (10,000 m ³ /day)	46.4	90.0
Percentage of wastewater treatment (%)	68	99.8
Effluent quality (BOD concentration: mg/L)	5–14	<10

(2) Number of Beneficiaries

There are approx. 1 million beneficiaries in the project.

(3) Internal Rate of Return (Economic and Financial Internal Rate of Return)

Based on the conditions given below, the financial internal rate of return (FIRR) is 5.5%.

[FIRR]

(a) Cost: Project cost, operation and maintenance expenses

<p>(b) Benefit: Income from sewage charge</p> <p>(c) Project life: 30 years</p>
<p>6. External Risk Factors</p>
<ol style="list-style-type: none"> 1. Delays in construction due to site changes caused by changes in road maintenance areas, development areas, etc. in urban planning 2. Impact on operation and maintenance due to shortages in financial funds or collected fees due to changes in the policies relating to the fee sharing principle
<p>7. Lessons Learned from Findings of Similar Projects Undertaken in the Past</p>
<p>From the ex-post evaluation of ODA loans granted in the past, it has been learned that it is important to set an appropriate fee schedule that takes into consideration operation and maintenance costs, investment costs, payment ability of beneficial residents, and ability for financial burden.</p> <p>In the project, an appropriate fee schedule will be set proportionate to the household finance of residents by raising in stages the sewage system fee, which is currently at a low rate. When it becomes time to revise the fee schedule it will be done by establishing a system that reflects the voices of the users by holding public hearings and the like.</p>
<p>8. Plans for Future Evaluation</p>
<p>(1) Indicators for Future Evaluation</p> <p>Population treated (10,000 persons), amount of wastewater treated (10,000 m³/day), percentage of wastewater treatment (%), effluent quality (BOD concentration: mg/L), financial internal rate of return (FIRR)(%)</p> <p>(2) Timing of Next Evaluation</p> <p>After project completion</p>