

Ex-ante Evaluation

1. Name of the Project

Country: The People's Republic of China

Project: Anhui Water Environmental Improvement Project

(Loan Agreement: March 30, 2007; Loan Amount: 8,400 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 Huai River basin where Bengbu City (population: 3.49 million; land area: 5,917 km²), Anhui Province, is located, recent efforts to construct sewage treatment facilities are not catching up with the increasing volume of sewage generated as a result of rapid economic development. Even in Bengbu City, a major industrial town, the volume of sewage (350,000 m³/day) exceeds the sewage treatment capacity (155,000 m³/day), and considering the expected increase in the volume of sewage that will be generated in the days to come, it is feared that the deterioration of the water quality of the Huai River will become even more serious than it is now. Thus, improving the water environment in the area concerned is a challenge that must be addressed immediately.

Furthermore, the proportion of households having access to a water supply service is low in Bengbu City, and inferior groundwater is widely used. Given the prospect of the growing demand for water in tandem with further economic development, to improve the living conditions of Bengbu residents, it is crucial to develop water supply infrastructure for which water is sourced from rivers having a better quality of water.

In response to this situation, in 2004, the Government of China (State Council Project Office) issued a "Notice concerning Measures against Water Pollution in the Huai River Basin." The notice called for further construction of sewage treatment facilities including pipes and drains, and declared that the water quality of the Huai River basin and the source of drinking water for the city should be raised to the level of water applied to general fish reserves and swimming areas. In response to this

message, the Bengbu Municipal People's Government also laid down the 11th Five-Year Plan for Environmental Protection in Bengbu City, in which it declared that top priority should be given to the development of sewerage facilities and to the improvement of the quality of the source of drinking water.

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 reduce polluted water discharged into the Huai River and ensure a stable supply of safe drinking water to Bengbu City, Anhui Province, by developing its water supply and sewerage infrastructure. It will thereby help improve the living conditions of its population.

4. Project Description

(1) Target Area

Bengbu City, Anhui Province (urban area, Huaiyuan County, Wuhe County, and Guzhen County)

(2) Project Outline

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

(a) Urban area

- Sewerage facilities (sewage pipes and drains: 158 km, sewage treatment plants [new construction: 200,000 m³/day], pumping stations: 2 locations)

(b) Huaiyuan County

- Sewerage facilities (sewage pipes and drains: 169 km, sewage treatment plants [new construction: 20,000 m³/day], pumping stations: 2 locations)
- Water supply facilities (water supply pipes and drains: 75 km, purification plants [additional construction: 30,000 m³/day], pumping station: 1 location)

(c) Wuhe County

- Sewerage facilities (sewage pipes and drains: 48 km)
- Water supply facilities (water supply pipes and drains: 43 km)

(d) Guzhen County

- Sewerage facilities (In industrial park – sewage pipes and drains: 15 km, sewage treatment plants [new construction: 20,000 m³/day])
- Water supply facilities (In industrial park – water supply pipes and drains: 22 km, purification plants [new construction: 20,000 m³/day], pumping station: 1 location)
- Water supply facilities (In county capital – water supply pipes and drains: 39 km, purification plant [additional installation: 10,000m³/day], pumping station: 1 location)

(e) Training: Training for sewerage and water supply projects

(3) Total Project Cost/Loan Amount

17,036 million yen (Yen Loan Amount: 8,400 million yen)

(4) Schedule

April 2007–December 2010 (45 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: Bengbu Municipal People’s Government
- (c) Operation and Maintenance System: State-run enterprises owned by the Bengbu Municipal People’s Government and by the People’s Government of each county under municipal jurisdiction.

(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 will be approved by the Anhui Environmental Protection Bureau in April, 2007.

(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 30 ha and the acquisition will be implemented in accordance with the domestic procedures of China. The project does not involve resident relocation.

(vii) Other/Monitoring

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

(b) Promotion of Poverty Reduction

A subsidy for water fee is available for the poor, and it will be applied to this project as well.

(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)

(a) Sewerage Project

Indicator	Baseline (2005 actual performance)	Target (2012, 2 years after project completion)
Population treated (10,000 persons)	61.4	127.4
Amount of wastewater treated (10,000 m ³ /day)	15.5	49.5
Percentage of wastewater treatment (%)	40	74
Effluent quality (BOD concentration: mg/L)	20	10
Effluent quality (COD concentration: mg/L)	60	50

(b) Water Supply Project

Indicator	Baseline (2005 actual performance)	Target (2012, 2 years after project completion)
Percentage of population served (%)	80	95
Population served (10,000 persons)	86.6	131.3
Amount of water supply (10,000m ³ /day)	33.2	47.5

(2) Number of Beneficiaries

(a) Development of sewerage facilities: Approx. 600,000

(b) Development of water supply facilities: Approx. 200,000

(3) Internal Rate of Return

Based on the conditions given below, the financial internal rate of return (FIRR) is as follows:

		Sewerage facilities development	Water supply facilities development
Urban area (Yangtaizi sewage treatment plant)		4.77%	-
Huaiyuan County		4.04%	6.08%
Wuhe County		4.37%	6.15%
Guzhen County	County capital	-	6.10%
	Industrial park	4.10%	6.46%

[FIRR]

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

(b) Benefit: Income from fees

(c) Project Life: 30 years

6. External Risk Factors

Impact on operation and maintenance due to shortages of collected fees caused by delays in the development of the target area

7. Lessons Learned from Findings of Similar Projects Undertaken in the Past

From the ex-post evaluation of ODA loans granted in the past, it has been learned that it is important (1) 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, and (2) to formulate technical standards for maintenance frequency such as operation and maintenance, and evaluation of the necessity for the replacement of facilities. Based on this lesson, efforts will be made in the project, through interim monitoring and supervision, etc., to ensure the establishment of an appropriate fee schedule and technical standards.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

Population treated (10,000 persons), amount of wastewater treated (10,000 m³/day), percentage of wastewater treatment (%), effluent quality (BOD concentration: mg/L), effluent quality (COD concentration: mg/L), percentage of population served (%), population served (10,000 persons), amount of water supply (10,000m³/day), financial internal rate of return(FIRR) (%)

(2) Timing of Next Evaluation

After project completion