

## Ex-ante Evaluation

### **1. Name of the Project**

Country: People's Republic of China

Project: Guangxi Zhuang Autonomous Region Yulin City Water Environment Improvement Project  
(Loan Agreement: June 23, 2006; Loan Amount: 6,282 million yen; Borrower: The Government of the People's Republic of China)

### **2. Necessity and Relevance of JBIC's Assistance**

In China, only 43% of sewage is treated in urban areas (2004). Moreover, sewerage facilities have not been developed widely in rural areas, where over one billion people live (the greater part of the population). As a result, pollution of rivers and fresh water lakes is becoming serious.

In its 10th Five-Year Plan (2001-2005), the Chinese government established goals of treating 60% of the sewage in all major cities by 2005, and 70% of the sewage in prioritized cities. Furthermore, water drawn and supplied from inferior water sources is becoming a problem. The same 10th Five-Year Plan (2001-2005) made protection for urban potable water sources a priority. It set the goal of meeting required surface water quality standards through policies such as reducing and preventing pollution, and changing water sources.

Yulin City is located in the southeastern part of Guangxi Zhuang Autonomous Region. In the city's central Yulin City Proper, construction of sewage treatment facilities has lagged behind, and this has left untreated household sewage and industrial wastewater being directly discharged for a long time into Nanliu River, one of the city's traditional water sources. As a result, water pollution has increased to the point that during water shortages, water quality deteriorates to a level unsuitable even for agricultural use. This is a severe problem.

In addition, Yulin City Proper currently uses the Nanliu River, groundwater and nearby dams for water sources, but there is increasing water pollution in Nanliu River as mentioned above, and pumping groundwater runs the risk of causing subsidence in the surrounding area. Thus, it is difficult to continue to rely on these water sources. Meanwhile, demand for water in Yulin City Proper is foreseen to increase further with its growing population.

This project corresponds to the activity of environmental conservation, a priority area stipulated both in the Economic Cooperation Program for China by the Japanese Government, and in the Medium-Term Strategy for Overseas Economic Cooperation Operations by the JBIC. Thus, JBIC's assistance for this project is highly necessary.

### **3. Project Objectives**

The Project will be carried out in Yulin City of Guangxi Zhuang Autonomous Region. It aims to reduce the discharge of effluents flowing into the Nanliu River, where there is significant water pollution, through developing sewage treatment and water supply facilities. It will develop sewage treatment and

water supply facilities in the city, to realize a stable supply of safe drinking water, thereby serving to improve the living environment of its residents.

#### **4. Project Description**

(1) Target Area

Yulin City, Guangxi Zhuang Autonomous Region

(2) Project Outline

Carry out civil works pertaining to construction of sewage treatment and water supply facilities in Yulin City, procure material and equipment, and provide training.

(a) Develop sewage treatment facilities

(b) Develop water supply facilities

(3) Total Project Cost/Loan Amount:

13,436 million yen (Yen Loan Amount: 6,282 million yen)

(4) Schedule

July 2006-March 2011 (57 months)

(5) Implementation Structure

(a) Borrower: The Government of the People's Republic of China

(b) Executing Agency: Yulin Municipal People's Government

(c) Operation and Maintenance System: Yulin Municipal People's Government

(6) Environmental and Social Consideration

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization

This project does not correspond to sensitive sectors, characteristics, or areas sensitive to impact as stipulated in the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" (established April 2002), and as such is not judged to have serious undesirable environmental impacts. For this reason, the project is classified as Category B.

(iii) Environmental Permit

The Guangxi Zhuang Autonomous Region People's Government Environmental Protection Bureau approved the Environmental Impact Assessment(EIA) report for the project in November 2005.

(iv) Anti-Pollution Measures

Water leaving sewage treatment facilities will be treated to meet Chinese domestic water emissions standards before being discharged into the river, where it is not foreseen to have any particular impact. Also, sludge created at sewage treatment plants is planned to be appropriately disposed of at already existing landfill disposal sites.

(v) Natural Environment

The project target area does not correspond to an area sensitive to impact or the surroundings of such areas, such as a national park. The Yujiang River has a huge water volume, so drawing water is not foreseen to have any particular negative impacts on the natural environment and ecosystem.

(vi) Social Environment

Steps will be taken in line with Chinese domestic procedures to acquire a 13ha site for the project. There will be no relocation of residents.

(vii) Other/Monitoring

The Yulin City Environmental Protection Bureau will monitor water quality for the project.

(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)

Project	Indicator	Baseline	Target
Development of sewage treatment facilities		(2005)	(2011, 1 year after completion of project)
	Population served (unit: 10,000 people)	0	35
	Sewage treatment volume (unit: 10,000m <sup>3</sup> /day)	0	10
	Percent of sewage treated (%)	0	77
	Quality of water discharged (BOD concentration, mg/L)	-	20
Development of water supply facilities*		(2004)	(2011, 1 year after completion of project)
	Percentage of population served (%)	59	91
	Population served (unit: 10,000 people)	29	57
	Maximum daily water supplied (unit: 10,000m <sup>3</sup> /day)	9.3	26

\* Indicators for development of water supply facilities are a total of the Chengbei Water Treatment Plant, Shanxin Water Treatment Plant, and Dapingshan Water Treatment Plant. Also, the baselines for maximum daily water supplied, and for water supply population served do not include those from Nanliu River and groundwater water sources.

(2) Financial Internal Rate of Return (FIRR): Development of sewage treatment facilities: 2.8%,

Development of water supply facilities: 3.3%

- (a) Costs: Project costs, operation and maintenance cost
- (b) Benefits: Revenue from fees
- (c) Project life: 30 years

#### **6. External Risk Factors**

- (1) Change in planned areas for road constructions or other developments under the current city planning may require change in target sites for the project and thus could cause delays in construction.
- (2) Change in the policy of principle of fee burden could cause a shortage of fiscal funds or fees collected. This in turn could affect operation and maintenance.

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

From past ex-post evaluations of yen loan projects, the lesson has been learned that to ensure sustainability of project results, it is important to set an appropriate fee system, considering operation and maintenance costs, investment cost, ability of beneficiary residents to pay, and the capacity for fiscal burden. It is also important to formulate technical standards for maintenance frequency, such as of operation and maintenance, and evaluation of the necessity of facility renewal. Thus, bearing this in mind, the project will confirm through interim supervision and other means that a system will be created to establish an appropriate fee system and formulate technical standards.

#### **8. Plans for Future Evaluation**

- (1) Indicators for Future Evaluation
  - (Development of Sewage Treatment Facilities)
    - (a) Population served (unit: 10,000 people)
    - (b) Volume of sewage treated (unit: 10,000m<sup>3</sup>/day)
    - (c) Percentage of sewage treated (%)
    - (d) Quality of water discharged (BOD) (mg/L)
    - (e) FIRR (%)
  - (Development of Water Supply Facilities)
    - (a) Percentage of population served (%)
    - (b) Population served (unit: 10,000 people)
    - (c) Maximum daily water supplied (unit: 10,000m<sup>3</sup>/day)
    - (d) FIRR (%)
- (2) Timing of Next Evaluation  
After completion of project