Ex-ante Evaluation

1. Name of the Project

Country: The People's Republic of China
Project: Xingjiang Environmental Improvement Project (I)
(Loan Agreement: March 30, 2007; Loan Amount: 12,998 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 remained at 48% (2005), while in rural areas sewerage facilities themselves have not spread very much. Consequently, the water pollution of rivers and freshwater lakes has become a serious problem. Additionally, since clean water sources are concentrated in the southwestern part of China, there are regional factors that cause water shortages. Also, there are many cities beset with the problem of having their water supplied from deteriorating sources. Furthermore, since China relies on coal for around 69% of its domestic energy consumption (2005), air pollution caused by sulfur oxide, soot, dust and other particles has become a serious problem. Given this situation, in the 11th Five-Year Plan (2006–2010), the Government of China is promoting a strengthening of environmental conservation and protection and renovation of natural ecosystems.

The Xingjiang Uygur Autonomous Region, located in China's western border region, is regarded as a pivotal region for the development of the western part of China. The four regional cities in Xingjiang where the project is implemented once prospered as bustling trading posts along the Silk Road. Today, these regional cities, relatively developed compared to other cities, have a respective population ranging from 200,000 to 400,000 and hold a special position for the development of the Autonomous Region. In these urban areas, however, rapid industrialization and urbanization, as well as sizable population growth, have boosted demand for water and heating. At the same time, environmental problems such as water and air pollution are getting increasingly serious. Thus, there is an urgent need to address these issues.

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 increase sewage treatment and water supply capacities and reduce the amount of water and air pollutants by developing sewerage and water supply systems and installing centralized heat supply facilities in the four regional cities in the Xingjiang Uygur Autonomous Region. It will thereby help improve the environment of the cities as well as the living conditions of the populations.

4. Project Description

(1) Target Area

Hami, Turpan, Wusu and Kuitun in the Xingjiang Uygur Autonomous Region

(2) Project Outline

(a) The project involves the construction and renovation of sewerage and water supply facilities

as well as the procurement of materials and equipment in the aforesaid four cities. It also involves the construction of centralized heat supply facilities and the procurement of materials and equipment in three of the four cities, namely, Hami, Turpan and Kuitun. In addition, as part of the project a training program will be conducted in Japan.

(a) Hami: Development of sewerage facilities (new construction and renovation of sewage pipes and drains), development of water supply facilities (construction of water supply aqueducts, new construction of purification plants, and new construction and renovation of distribution pipes and drains), and development of centralized heat supply facilities (construction of heat supply facilities, installation of heat supply pipes, and construction of heat-exchange stations)

(b) Turpan: Development of sewerage facilities (new construction and renovation of sewage pipes and drains, new construction of sewage treatment plants, and renovation of existing sewage treatment plants), development of water supply facilities (construction of water supply aqueducts as well as new construction and renovation of distribution pipes and drains), and development of centralized heat supply facilities (construction of heat supply facilities, installation of heat supply pipes, and construction of heat exchange stations)

(c) Wusu: Development of sewerage facilities (new construction and renovation of sewage pipes and drains) and development of water supply facilities (new construction and renovation of distribution pipes and drains)

(d) Kuitun: Development of sewerage facilities (new construction and renovation of sewage pipes and drains, new construction of sewage treatment plants, and expansion of existing sewage treatment plants), development of water supply facilities (new construction and renovation of distribution pipes and drains), and development of centralized heat supply facilities (construction of heat supply facilities, installation of heat supply pipes, and construction of heat-exchange stations)

(3) Total Project Cost/Loan Amount

18,712 million yen (Yen Loan Amount: 12,998 million yen)

(4) Schedule

May 2007–December 2012 (68 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: Xinjiang Uygur Autonomous Region People’s Government

(c) Operation and Maintenance System:

City	Sub-Project	Operation and Maintenance System
Hami	Development of sewerage facilities	Sewage Treatment Plant in Hami City
	Development of water supply facilities	Water Works in Hami City
	Development of centralized heat supply facilities	Mingzhu Heating Power Company in Hami City

Turpan	Development of sewerage facilities and water supply facilities	Turpan Wanquan Water Supply and Drainage Company
	Development of centralized heat supply facilities	Heat Supply Company in Turpan City
Wusu	Development of sewerage facilities	Sewage Treatment Plant in Wusu City
	Development of water supply facilities	Water Works in Wusu City
Kuitun	Development of sewerage facilities	Sewage Treatment Plant in Kuitun City
	Development of water supply facilities	Water Works in Kuitun City
	Development of centralized heat supply facilities	Heat Supply Company in Kuitun City

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

(iii) Environmental Permit

Regarding Turpan, the Environmental Impact Assessment (EIA) report related to the project was approved by the Xinjiang Uygur Autonomous Region Environmental Protection Bureau in January, 2007. Regarding Hami, Wusu and Kuitun, the EIA report related to the project was approved by the said bureau in February, 2007.

(iv) Anti-Pollution Measures

Wastewater from sewerage facilities and centralized heat source centers will be treated and released into rivers, deserts and the like (some sewage treated wastewater is used as irrigation in afforestation programs) in a state and manner that meets the wastewater standards established in China. Thus, no significant adverse impact is forseen. Additionally, although some of the sludge generated in sewage treatment plants will be used as fertilizer for afforestation, highly contaminated sludge will be appropriately disposed of in existing disposal area. Furthermore, regarding air pollution and other issues that may come up after the project is started, domestic environmental standards are expected to be met by implementing measures such as the installation of dust collectors and desulfurizers.

(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 enivronment is assumed to be minimal.

(vi) Social Environment

The project involves land acquision of about 52 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 environmental observation stations set up in each of the four cities will monitor the noise, water quality, air pollution, wastewater and so on.

(b) Promotion of Poverty Reduction

The poor make up 3.7% of the population in Hami, 6.3% in Turpan, 10.0% in Wusu, and 1.2% in Kuitun. The poverty rate in three of the four cities exceeds the national average of 2.8%. To help the poor, each of the four cities introduced lower fee for water supply and heat supply, and it will be applied to this project as well.

(c) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases including AIDS, Participatory Development, Consideration for the Handicapped, etc.)

None

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

(a) Development of Sewerage Facilities

Indicator	Baseline (2005 actual performance)	Target (2012, at project completion)
Population treated (10,000 persons)	42.3	78.8
Amount of wastewater treated (10,000 m^3/day)	10.1	23.5
Percentage of wastewater treatment (%)	63.0	92.9
Effluent quality (BOD concentration: mg/L)	18–121	≦20–36
Effluent quality (COD concentration: mg/L)	59–226	≦60–100

(b) Development of Water Supply Facilities

Indicator	Baseline (2005 actual performance)	Target (2012, at project completion)
Percentage of population served (%)	72.7	99.6
Population served (10,000 persons)	46.0	79.3
Amount of water supply (10,000m^3/day)	18.2	30.0

(c) Development of Centralized Heat Supply Facilities

Indicator	Baseline (2005 actual performance)	Target (2012, at project completion)
SO_2 emission reduction volume (t/year)	–	1,029

NOx emission reduction volume (t/year)	–	707
TSP emission reduction volume (t/year)	–	29,834

(2) Number of Beneficiaries

(a) Development of sewerage facilities: Approx. 380,000

(b) Development of water supply facilities: Approx. 350,000

(c) Development of centralized heat supply facilities: Approx. 300,000

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

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

City	Sub-project	Internal rate of return
Hami	Development of sewerage facilities	4.4%
	Development of water supply facilities	6.0%
	Development of centralized heat supply facilities	6.0%
Turpan	Development of sewerage facilities	10.3%
	Development of water supply facilities	7.5%
	Development of centralized heat supply facilities	9.6%
Wusu	Development of sewerage facilities	4.5%
	Development of water supply facilities	6.2%
Kuitun	Development of sewerage facilities	4.7%
	Development of water supply facilities	6.3%
	Development of centralized heat supply facilities	6.3%

[FIRR]

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

(b) Benefit: Income from fees, subsidy

(c) Project Life: 20 years

6. External Risk Factors

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
3. Risk of a fluctuation in the price of coal, the fuel for centralized heat supply facilities

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 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. Based on this lesson, efforts will be made in the project to ensure the planning of an appropriate fee schedule.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- Development of sewerage facilities: Population treated (10,000 persons), amount of wastewater treated (10,000 m^3/day), percentage of wastewater treatment (%), effluent quality (BOD concentration: mg/L), effluent quality (COD concentration: mg/L), financial internal rate of return (%)
- Development of water supply facilities: Percentage of population served (%), population served (10,000 persons), amount of water supply (10,000m^3/day), financial internal rate of return (%)
- Development of centralized heat supply facilities: SO_2 emission reduction volume (t/year), NOx emission reduction volume (t/year), TSP emission reduction volume (t/year), financial internal rate of return (%)

(2) Timing of Next Evaluation

After project completion