

JBIC ODA Loan Projects: Mid-Term Review

Time of Mid-Term Review Field Survey: May 2006

Project Title: People's Republic of China: Changsha Water Supply Project (L/A No. CXXII-P132)

[Loan Outline]

Loan Amount/Contract Approved Amount/Disbursed Amount: 4,850 million yen/4,845 million yen/4,016 million yen (as of end May 2006)

Loan Agreement: March 2001

Final Disbursement Date : July 2006

Executing Agency: Changsha Municipal People's Government (Hunan Province Finance Department, Foreign Trade and Economic Cooperation Department)/Changsha Water Service Investment Management Co.

[Project Objective]

In Changsha city in Hunan Province the project plans to improve the water supply capacity in Hedong District (population approx. 1.5 million) by building Water Treatment Plant No. 8, which has a treatment capacity of 500,000m³/day with the Xiangjiang river serving as a water resource, and by providing water transmission and distribution mains, and thereby help to improve the living environment of residents in that area and regional economic development.

Consultants: Hunan Province Construction Design Institute (outside of the ODA loan)

Contractors: Hubei International (China)

Item	Results of ex-ante evaluation (July 2000)	Ex-post evaluation results as estimated at time of mid-term review
[Relevance] (1) National policy level (2) Policy level	(1) In China, against the background of industrialization and dense populations, the water demand in coastal metropolises and inland cities is rising. In the Ninth Five-Year Plan (1996-2000), the provision of water supply infrastructure in rural cities was positioned as a major issue. In the 10th Five-Year Plan (2001-2005), it was also expected to play a major part. (2) Following on coastal metropolises, in the latter half of the 1990s urbanization progressed rapidly thanks to rapid industrialization and population concentration in large and medium-sized inland cities. In inland areas as well, the supply and demand gap due to the increased demand in water has become a problem.	(1) While the 10th Five-Year Plan (2001-2005) advocated water conservation, it also treated the expanded capacity of water supply as a priority policy. In particular, the plan set the objective of achieving an urban water supply reach of 98.5% by 2005. In addition, the 11th Five Year Plan (2006-2010) recognized that there were limitations on the water resources. The 10th National People's Congress emphasized in its Fourth Session held on March 14, 2006 that strengthening infrastructure is as critical for adjusting the industrial structure and that better management of the development and utilization of water resources is necessary. (2) In the Hunan Province 10th Five-Year Plan outline, improvement of the urban environment through strengthening of urban infrastructure provisions have become strategic policies and the water project for drinking in Changsha is mentioned as a vital project.

<p>(3) Planning level</p>	<p>(3) In Changsha city, the provincial capital of Hunan, rising population and increased demand for water is causing a serious problem in the water supply shortage. As of now, the capacity of the facility is short of 200,000m³/day and this gap is expected to grow to a shortage of 510,000m³/day by 2008.</p> <p>The project is building water supply facilities with a capacity of 500,000m³/day in Changsha city Hedong District, and the project is of high priority in terms of addressing the above issue. Moreover, the JBIC has already specified in its policy for country assistance that activities to address environmental issues and revising disparity among regions, especially inland areas, are critical areas. The project meshes well with the policies of the JBIC.</p>	<p>(3) With the completion of Water Treatment Plant No. 8, water supply capacity has increased by 500,000m³/day to 1,320,000m³/day in the Hedong district of Changsha city. As a result, it will be possible to cope with anticipated 1,250,000m³/day demand for Hedong district up through 2008, and at the time of mid-term review, it can be said that the initial targets have been achieved.</p>																																										
<p>[Effectiveness]</p>	<p>(1) Operation and Effect Indicators 1) Quantitative effects</p> <table border="1" data-bbox="412 692 1167 1217"> <thead> <tr> <th></th> <th>1999 (at time of ex-ante evaluation)</th> <th>Year completed (2004)</th> <th>Target figures (2008)</th> </tr> </thead> <tbody> <tr> <td>Population served (tens of thousands)</td> <td>137.9</td> <td>150.9</td> <td>160.3</td> </tr> <tr> <td>Water supply volume (10,000m³/day) (1 day avg.)</td> <td>80.5</td> <td>93.2</td> <td>100.8</td> </tr> <tr> <td>Unaccounted for water rate (%)</td> <td>21.2</td> <td>16</td> <td>16</td> </tr> <tr> <td>Leakage rate (%)</td> <td>18</td> <td>14</td> <td>14</td> </tr> <tr> <td>Percentage of population served with water (%)</td> <td>100</td> <td>100</td> <td>100</td> </tr> </tbody> </table>		1999 (at time of ex-ante evaluation)	Year completed (2004)	Target figures (2008)	Population served (tens of thousands)	137.9	150.9	160.3	Water supply volume (10,000m ³ /day) (1 day avg.)	80.5	93.2	100.8	Unaccounted for water rate (%)	21.2	16	16	Leakage rate (%)	18	14	14	Percentage of population served with water (%)	100	100	100	<p>(1) Operation and Effect Indicators 1) Quantitative effects</p> <table border="1" data-bbox="1240 692 2047 1185"> <thead> <tr> <th></th> <th>At time of mid-term review (2005)</th> <th>Target figures (2008)</th> </tr> </thead> <tbody> <tr> <td>Population served (tens of thousands)</td> <td>150</td> <td>160.3</td> </tr> <tr> <td>Water supply volume (10,000m³/day) (1 day avg.)</td> <td>96.7</td> <td>100.8</td> </tr> <tr> <td>Unaccounted for water rate (%)</td> <td>19.3</td> <td>16</td> </tr> <tr> <td>Leakage rate (%)</td> <td>16.7</td> <td>14</td> </tr> <tr> <td>Percentage of population served with water (%)</td> <td>100</td> <td>100</td> </tr> </tbody> </table> <p>At the time of the mid-term review, the population served with water and the water volume in the Hedong district were generally in line with figures anticipated at the time of the ex-ante evaluation. This project secured 1,320,000m³/day water supply capacity, which will meet the 1,250,000m³/day demand expected for 2008. In addition, the Zhushuqiao water treatment plant, with a capacity of 300,000m³/day, is expected to be</p>		At time of mid-term review (2005)	Target figures (2008)	Population served (tens of thousands)	150	160.3	Water supply volume (10,000m ³ /day) (1 day avg.)	96.7	100.8	Unaccounted for water rate (%)	19.3	16	Leakage rate (%)	16.7	14	Percentage of population served with water (%)	100	100
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	<p>2) Qualitative effects In order to cope with rising water demand, the project was expected to provide the living or social infrastructure, which would yield economic impact, while ensuring steady supply of safe purified water and improving the living environment.</p> <p>(2) Analysis of factors that affect project effectiveness and impact 1) Land acquisition and relocation of residents 70,000m² of land was acquired to serve as project construction sites.</p> <p>2) Impact on the environment</p> <p>3) Landfill site for sludge treatment in Wangcheng county Sludge produced in the water treatment process was to be reduced to a concentrated form through mechanical dewatering, and transported to a landfill site currently under construction in the outskirts of Wangcheng county (The plant is expected to be completed at the end of 2001).</p> <p>(3) Factors that affect sustainability The profitability of this project depends heavily on setting up a fair fee system. An appropriate fee system should be established as follow-up work.</p>	<p>built by 2008. Once it is completed, capacity will rise to 1,620,000m³/day, meeting the demand for 2010.</p> <p>2) Qualitative effects Same as shown at left (In particular, improvements to the urban living environments).</p> <p>(2) Factors which may influence the effectiveness and impact 1) Land acquisition and relocation of residents No problems in particular.</p> <p>2) Impact on the environment</p> <ul style="list-style-type: none"> • No particular environmental problems arose during the construction work. • There were no problems with the quality of the water source, but after heavy rain, muddy water from the Xiangjiang river brought an accumulation of mud near the intake ports. The executing agency is paying attention to the management of the intake port areas. <p>3) Landfill site for sludge treatment in Wangcheng county</p> <ul style="list-style-type: none"> • The sludge treatment facilities are still under trial operation, and full-scale operation has not yet begun. • Once the water has been evaporated from the sludge, it will be buried in landfills at the treatment plant for solid waste matter in Wangcheng county, Changsha city (The treatment plant has been completed). <p>4) Cooperation with Japanese local authorities Changsha city is a sister city of Kagoshima city. So far, some twenty people associated with the Changsha city waterworks have visited Kagoshima. People from Kagoshima have also visited Changsha. This has strengthened the exchange of personnel and sharing of technical information.</p> <p>(3) Factors which may influence the sustainability 1) Finances</p> <ul style="list-style-type: none"> • Water fees were set in an urban water supply price management policy by the National State Planning Commission and Ministry of Construction in 1998. With the prerequisite that water rates be sufficient
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		<p>to recover costs, a profit ratio of 8%-10% is added on top of the cost.</p> <ul style="list-style-type: none"> The actual decisions on water fees is made by local authorities, and in Changsha city, the Changsha City Price Bureau has the final say. The current fee was revised in June 2002, The water rate includes the water resource fee, and is collected together with the sewage treatment fees. <p>2) Present status of the executing agency's structure (privatization, etc.)</p> <ul style="list-style-type: none"> The Chinese government continues to introduce competitive mechanisms. The role of the government and local authorities is shifting from a position of managing state enterprises to one of monitoring the market. Initially, Changsha city operated and managed the project through the Changsha Water Corporation, but in 2004 the Changsha Waterservice Investment Management Co., Ltd. was established to split the service for asset management and for project operations. In other words, assets management is handled by the Changsha Waterservice Investment Management Co., Ltd. The water supply service performed by the Changsha Water Corporation was divided into water treatment and water distribution. The Changsha Waterservice Investment Management Co., Ltd is in charge of water treatment service, for which the company established independent subsidiary companies for each treatment plants (The recent target project, the Water Treatment Plant No. 8, is to become the Eighth Water Management Co., Ltd.). Water distribution is handled in the same manner by its subsidiary company, the Changsha Water Supply Co., Ltd. At the same time, as part of its new supervisory role, Changsha city provides laws and ordinances such as the Water Supply Regulations, discloses procedures under its water supply department, publicly discloses water quality levels, and conducts public hearings as the occasion arises.
Information for reference		
<p>[Efficiency] (1) Outputs</p>	<p>(1) Outputs 1) Water intake facilities Intake pipes: 30m × 2 Water intake pump stations</p>	<p>(1) Outputs</p> <ul style="list-style-type: none"> There were no major changes to a) water intake facilities, b) aqueduct facilities, c) water treatment facilities, or d) water treatment facilities. As for e) water distribution facilities, following the transfer of the city

(2) Project period	<p>2) Aqueduct facilities Aqueduct: roughly 850m × 2</p> <p>3) Water treatment facilities (flocculation basin, sedimentation basin, and filtration pond) Capacity: 500,000m³/day (built in two construction phases, with each phase accounting for 250,000m³/day)</p> <p>4) Water supply facilities Water supply mains: approx. 400m × 2</p> <p>5) Water distribution facilities Water distribution grid: approx. 280km 1 new pressure pump station and one expanded pressure pump station</p> <p>Consulting services Outside of the scope of the ODA loan</p> <p>(2) Project period March 2001-December 2004 (46 months)</p> <p>Dates completion expected: First phase: December 2002 Second phase: December 2004</p>	<p>government to the southern area, some of the pipe-laying distances were changed. According to a report from the Chinese side provided at the time of the mid-term review, the total distance of water distribution grid has become approx. 250km. In addition, construction of a new pressure pump station (one location) and expansion of another (1 location) is being postponed because there continues to be a surplus in its capacity. However, deterioration in the pumps means that steps will have to be taken in the near future.</p> <p>Consulting services Outside of the scope of the ODA loan</p> <p>(2) Project period March 2001-December 2005 (58 months) (project completed)</p> <p>(Reasons for the delay) One of the factors behind the fact that the initially projected completion date was delayed by a full year is that time was needed by China to make adjustments for each bid to purchase materials and machinery. According to the Chinese executing agency, the first phase of the project (with a capacity of 250,000m³/day) was for the most part completed by September 2000.</p>
Lessons Learned and Recommendations	<p>(Lessons learned) The accumulation of information and improvement in capabilities through local-level exchanges between both countries is expected to further heighten the fruits of the project. In similar projects to be undertaken in the future, it will be needed to confirm the result of participation by Japan's local authorities (exchanges in the past through sister city relationships) and possibility of capacity building/transfer through help from Japanese local authorities and that capacity building/transfer will be effected and information accumulated through such exchanges.</p>	
Indicators set for use at the ex-post evaluation		<p>Population served (10,000 people) Water supply volume (10,000m³/day) (1-day average) Unaccounted for water rate (%) Leakage rate (%) Percentage of population served (%)</p>

		The indices established at the time of the appraisal are same as the ones used for regular water services and can be obtained continuously to measure operational efficiency.
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【Reference】

Table 1. Demand forecasts (Hedong district) and facilities capacity
(response from the Changsha Waterservice Investment Management Co., Ltd
at the time of the midterm review)

Year	1999 Results	2000 Results	2002 Results	2005 Results	2008 Results	2010 Results
Population served with water (10,000 people) (Included: Migratory population)	140 (185)	142 (188)	145 (193)	150 (205)	160 (215)	170 (230)
Demand (10,000m ³ /day)	93	99	105	115	125	140
Capacity of facilities (10,000m ³ /day)	74	99	107	132	* 162	162
Shortfall/surplus (10,000m ³ /day)	19	0	2	17	37	22

*The Zhushuqiao water treatment plant is expected to be built by 2008, providing a capacity of 300,000 m³/day.

Table 2. Capacities of water treatment plants in Changsha city (unit: 10,000 m³/day)

	Capacity of facilities 1999	Capacity of facilities 2005
Water Treatment Plant No. 1	12	20
Water Treatment Plant No. 3	30	30
Water Treatment Plant No. 5	30	30
Water Treatment Plant No. 7	2	2
Water Treatment Plant No. 8	0	50
Total for the Hedong district	74	132
Water Treatment Plant No. 2	5	5
Water Treatment Plant No. 4	25	25
Total for the Hexi district	30	30
Total within Changsha city	104	162

Note: Small-scale water treatment plants not included.