

# REPUBLIC OF KOREA

## City Water Project (Seoul)

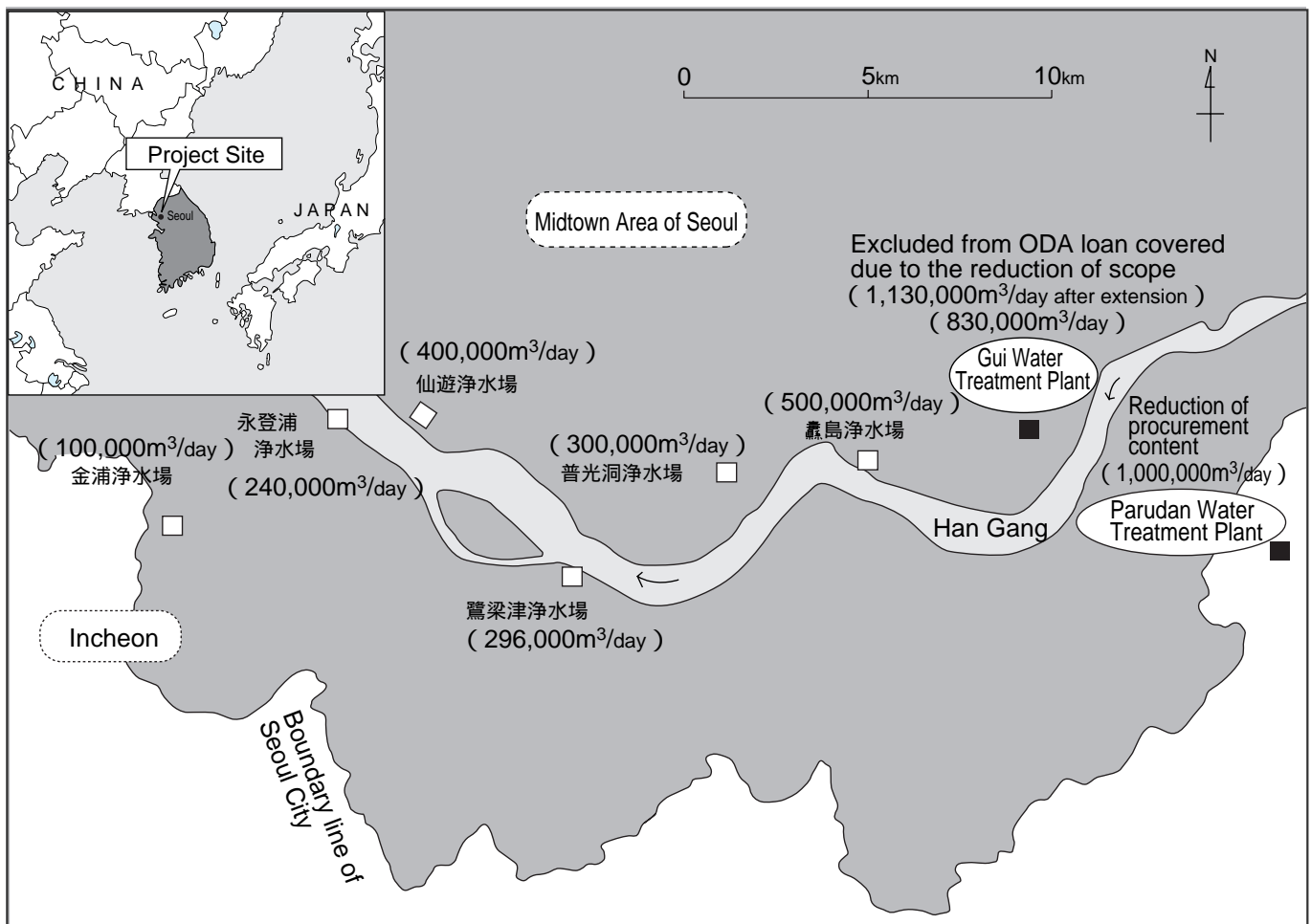
Report Date: January 1999

Field Survey: Not implemented

### 1 Project Summary and JBIC's Cooperation

This project is designed to install modern equipment and facilities at the Parudan and Gui water source, the two largest of the water sources (water treatment plants) serving Seoul, in order to stabilize the supply of water to the city. It also aims to automate and optimize the analysis of water quality and the addition of chemicals. The ODA loan covers nearly the entire foreign currency portion of the project cost.

Borrower / Executing Agency	Government of Republic of Korea / City of Seoul, Water Supply and Sewerage Department
Exchange of Notes / Loan Agreement	June 1984 / August 1984
Loan Amount / Loan Disbursed Amount	· 2,900 million / · 266 million
Loan Conditions	Interest: 4.75%, Repayment Period: 25 years (7 years for grace period), General untied (partial untied for consultants)
Final Disbursement Date	August 1989



## 2 Evaluation Results

### (1) Project Implementation

#### (i) Project Scope

The modernization of the Gui water source, which was a large part of the project, was excluded, and procurement for the Parudan water source was scaled down, leaving the project scope radically changed. This change was made because the government of Republic of Korea altered its water source modernization policy due to concern over the increased burden of repayments caused by the rapid appreciation of the Yen (the Yen/Won exchange rate rose over 1.6 fold compared to that at the time of the appraisal). Thus the simultaneous modernization of both the Gui and the Parudan water sources was cut back to modernization of Parudan alone.

#### (ii) Implementation Schedule

Completion was delayed by three years and nine months compared to the original planned completion date. The main causes of the delay were (a) late completion of the detailed design and (b) the time taken to revise the project scope. While the detailed design was being conducted in advance of this project, the examination of technical problems was very time consuming. The (b) was unavoidable because of the rapid appreciation of the Yen, as described above, which was an unforeseeable factor.

#### (iii) Project Cost

Due to the radical reduction in the project scope and the low procurement price for the equipment, the cost of this project was approximately one tenth of the original plan. The equipment procurement cost was reduced by low contract price from local contractors, but the equipment has worked steadily and had no problems in quality or durability.

### Comparison of Original Plan and Actual

(1) Project Scope	Plan		Actual	
	Gui water source	Parudan water source	Gui water source	Parudan water source
Intake pump related facility	1 set	Ñ		Ñ
Chemical doses facility	15 pumps	4 pumps		6 pumps
Chlorine feeding facility	8 pumps	8 pumps		6 pumps
Water quality management facility	7 gauges	3 gauges		6 gauges
Pre-treatment facility	20 gauges	5 gauges	(Suspended in all)	6 gauges
Filtration facility	1 set	Ñ		Ñ
Pump facility	10 gauges	6 gauges		Not implemented
Monitoring system of water treatment plant facility	1 set	1 set		1 set
Control computer facility	2 units	2 units		2 units
Drainage control facility	36 gauges	26 gauges		Not implemented
Central monitoring panel	1 unit	1 unit		1 unit
<b>(2) Implementation Schedule</b>				
Consulting service (Contract ~ completion of service)	February 1985 ~ April 1986 (15 months)		September 1987 ~ February 1990 (30 months)	
Procurement procedures of equipment and materials (~ contract)	October 1984 ~ February 1985 (5 months)		January 1988 ~ October 1988 (10 months)	
Manufacture/shipment	May 1985 ~ December 1985 (8 months)		March 1989 ~ November 1989 (9 months)	
Installation/test operation	December 1985 ~ April 1986 (5 months)		June 1989 ~ January 1990 (8 months)	
<b>(3) Project Cost</b>				
Foreign currency portion	· 2,931 million		· 266 million	
Local currency portion	4,097 million won		1,092 million won	
Total	· 4,322 million		· 472 million	
Exchange rate	1 won = · 0.308		1 won = · 0.189	

### (2) Organization of the Executing Agency (implementation and operation/maintenance after completion)

#### (i) Implementation Scheme

Negotiations between the executing agency (City of Seoul, Water Supply and Sewerage Department) and the consultants over the posting of engineers did not proceed smoothly. Difficulties apparently arose because both the executing agency and the Korean Procurement Agency (which was solely responsible for procurement) were not fully aware that a certain number of engineers would have to be posted to supervise the works if the project was to be technically reliable.

However, once the contract was signed with the consultant, the project proceeded smoothly, which indicates that there was no problem with the consultant's implementation ability.

(ii) Operations and Maintenance

The Parudan water source went into operation as soon as the construction work was completed and has been running well ever since. The City Water Project, including the Gui water source which was omitted from this project, has since been implemented with the government's own budget.

**(3) Project Effects and Impacts**

(i) Improvement and stabilization of water quality

Quality of Seoul's Clean Water									(mg/l)
		Turbidity (NTU)	KMnO <sub>4</sub> Consumption volume (mg/l)	THM (mg/l)	NH <sub>3</sub> (mg/l)	Cl <sup>-</sup> (mg/l)	NO <sub>3</sub> (mg/l)	Fe (mg/l)	Mn (mg/l)
Standards	WHO	5.00		0.10	0.50	250.00	10.10	0.30	0.10
	Korea	2.00	10.00	0.10	0.50	150.00	10.00	0.30	0.30
Measurement	Seoul	0.14	2.00	0.01	0.00	14.30	1.70	0.01	0.00

(Note) The standards in the table are maximum values.

(Source) City of Seoul, Water Supply and Sewerage Department.

(ii) Rapid response to changes in water quality due to continuous monitoring of water quality.

(iii) Reduced running costs due to optimized chemical doses.

(iv) Effective use of personnel due to labor saving.

### 3 Lessons Learned

Nothing in particular.



(1) Sedimentation Basin of the Parudan Water Source



(2) Water Quality Test at Water Treatment Plant Office (Responsible for maintenance of Parudan Water Source)