China

Nine Provinces and Cities Telephone Network Expansion Project (1) (2) (3)

Report Date: October 2002
Field Survey: July 2001

1. Project Profile and Japan's ODA Loan

Site Map

Guangzhou Telecommunications Bureau
(A part of telephone network of the nine provinces and cities)

1.1 Background

In 1989, telephone density[1] in China was as low as 0.98% and its improvement was listed as a national key objective. Ministry of Posts & Telecommunications (presently, Ministry of Information Industry) planned to increase telephone density by 2000 as follows: 2.8% as national average; around 10% in urban areas; 1% or more in rural areas; 25% or more in major cities such as Beijing, Tianjin, Shanghai, and Guangzhou; 20% or more in provincial capital cities, cities of economic center, and coastal open cities; 5% or more in mid-sized cities and capital cities of prefectures.

To accomplish the above targets, expansion of telephone exchanges was planned and executed in the 7th 5-Year Plan (1986-1990) and the 8th 5-Year Plan （1991-1995）.

Expansion of	The 7th 5-Year Plan	Actual	The 8th 5‐Year Plan	Actual
in-city exchange out-city exchange	2.5–3 million lines 60 thousand lines	3.7 million lines 100 thousand lines	6 million lines 150 thousand lines	N.A.

Economic development has been proceeding in all of the nine provinces and cities of the project target, in which, on the other hand, there is significant demand-supply gap of telephone service. As of 1989, telephone density in these provinces and cities was between 0.4 and 3.7%, which was far from the above-mentioned long-term targets and telephone service was in the extremely undeveloped situation. As a result, the government of China desired to implement this project as soon as possible to improve the telephone service.

[1] Telephone density is same as telephone diffusion rate (number of telephones per 100 inhabitants)

1.2 Objectives

To ease congestion in communications network and to cope with the future demand increase by expansion and modernization of telecommunications network through development and expansion of 765,000 lines of in-city exchange, 30,320 lines of out-city exchange, and 1,400 lines of international exchange, together with transmission lines, center facilities, mobile communications, in-city subscribers' cables in the nine provinces and cities, namely, Tianjin, Shanghai, Guangdong, Heilongjiang, Fujian, Shanxi, Jilin, Zhejiang, and Jiangsu.

1.3 Project Scope

(1) Installation of telephone exchange system concerning the above mentioned objectives in the nine provinces and cities;
(2) Installation of transmission facilities;
(3) Installation of in-city subscribers' cables;
(4) Expansion of mobile communications facilities;
(5) Construction of office buildings.

ODA loan covers all of foreign currency portion of total project cost.

1.4 Borrower/ Executing Agency

The government of the People's Republic of China / Ministry of Posts and Telecommunications (Presently, Ministry of Information Industry)

1.5 Outline of Loan Agreement

Item	Phase 1	Phase 2	Phase 3
Loan Amount	17,800 million yen	11,576 million yen	14,358 million yen
Loan Disbursed Amount	17,800 million yen	11,576 million yen	13,741 million yen
Exchange of Note	December 1990	September 1991	October 1992
Loan Agreements	January 1991	October 1991	October 1992
Terms and Conditions			
Interest Rate	2. 5% p.a.	2.6% p.a.	2.6% p.a.
Repayment (Grace) Period	30 (10) years	30 (10) years	30 (10) years
Procurement	General Untied	General Untied	General Untied
Final Disbursement Date	February 1996	November 1996	November 1997

2. Results and Evaluation

2.1 Relevance

The objective of the project at the time of appraisal was "improvement of communication system in the nine provinces and cities to ease congestion in the communication network as well as to cope with the future demand increase", which aims to heighten Chinese telephone density up to 2.8% as national average, 10% in urban areas, and 1% in rural areas. It is considered that the objective has been consistent with the Chinese development plan and development policy since the time of appraisal.

Out of 6 main objectives of economic structural adjustment plan in the 10^{th} 5-Year Plan, announced in March 2001, 3 items such as "significant improvement in informatization level of

the national economy and society", "further development of infrastructure", and "higher level of urbanization" are all relevant to the improvement of communication infrastructure. Especially, development of basic communication infrastructure was considered indispensable to achieve the general objective (development of information infrastructure) in China, taking it into consideration the following description in the plan -Chapter 6 Section 2 (development of information infrastructure), namely, "China will promote the construction of database on basic conditions of the country, public information resources, macro economy, and the construction of its exchange service center, the integration of 3 major networks of communication, television, and computer (3-network integration)". Thus, the project still continues to be relevant.

In recent years, many facilities introduced by the project has been renewed, however, the project played an important role as an initial investment and through the construction of infrastructure which were indispensable for drastic advancement of the Chinese communication service. Therefore, we can recognize that Project remains to be relevant at present, too.

2.2 Efficiency

2.2.1 Project Scope

In comparison with the original plan, the following modifications are observed, i.e. an increase of 25,000 lines of in-city exchange, a decrease of 9,500 lines of out-city exchange, a decrease of 1,400 lines of international exchange.

Concretely, in Fujian Province and Zhejiang province, while 50,000 lines and 60,000 lines of installation of in-city exchange were planned respectively, 10,000 lines and 15,000 lines were added at the time of implementation, judging from their installation plan was too small compared with actual needs.

In Shanghai, Heilongjiang, Shanxi, installation plans of out-city exchange were excluded from the scope of the project, because it was prospected that the installation would be possible using domestic and other funds. Also, in Shanghai, the change in the installation plan (international exchange was excluded and cut down of mobile communication systems from 3 (planned) to 1) is attributable to the same reason. On the other hand, as a practical response to the needs, the scale of in-city subscribers' cables also has expanded from planned 2,228,000 Pair km to 2,460,000 Pair km.

2.2.2 Schedule

While the planned construction period of the whole project was from January 1990 to March 1996, actual period was from January 1991 to June 1998, which means the completion of the project delayed by 2 years and 3 months from the original schedule.

Specifically, the period of procurement and transportation of facilities was from September 1992 to June 1997, which means a year and 11 months delay from the original schedule. The installation of facilities had been done between February 1993 and June 1998; 2 years and 3 months delay. On the other hand, the construction period of office building had been done between January 1991 and June 1994, which was shortened from the original schedule by 2 years and a half. The reasons for the extension of the procurement, transportation, and installation periods are: (1) It took much time for the procedures such as application, examination, and approval owing to the change in the project scope; (2) In accordance with the scope change, there occurred a necessity for renegotiation of agreements concerning procurement and transportation of facilities as well as delays of delivery; and (3) The volume of

installation works has increased in Fujian and Zhejiang province, and the scale of in-city subscribers' cables in the project as a whole has expanded.

2.2.3 Project Cost

Although the local currency portion of the project cost was as planned, actual foreign currency portion was lower than the planned amount by 12.2 billion yen. The main reason for this is that the currency used for the procurement of a part of exchange facilities was switched from the originally scheduled foreign currency to local currency; in 1992, then Ministry of Posts & Telecommunications decided to unify out-city exchange of each provincial capital city concerning the project to a model made in China, which was based on the judgment that procurement by optional contracts is not appropriate as objects of ODA loan, including all of the procurement of out-city exchange of provincial capital cities in the phase 1 construction, which already had been in implementation. The procurement planned in the subsequent phase 2 onward was excluded from the object of ODA loan in order to procure them with local currency.

2.3 Effectiveness

The objectives of the project, "improvement in communication system in nine provinces and cities to aim at easing congestion in communication network as well as coping with the future demand increase," is inferred to have achieved, judging from the change in the data of telephone exchange capacity, subscribers' cables, and subscribers' lines on the waiting list for main lines.

2.3.1 Capacity of telephone exchange system, number of subscribers' cables and subscribers' lines on the waiting list for main lines in the nine provinces and cities

In-city exchange system in the nine provinces and cities has increased by 56.7 million lines in 8 years from 1990 to 1998 (the project has completed in 1998); the capacity in 1998 is 14.5 times of that in 1990, while the number of subscribers' cables in 1998 is 39.2 million which is 11.8 times of that in 1990. Although the project is a part of the whole plan, it has made a certain contribution to easing a tightened situation in communication sector.

Table 1: Trend of the number of in-city/ out-city exchanges and in-city subscribers' cables (unit: 1,000 lines)

	1990	1995	1998 completion of the project	2000
In-city exchange	4,200	35,170	60,900	72,980
Out-city exchange	160	1,590	N.A.	2,250
Subscribers' cables	3,430	20,070	39,190	59,380

Source: a material of China Telecom Group

Table 2 shows an exchange capacity, the number of subscribers' cables, and subscribers' lines on the waiting list for main lines by province and city. In each province and city, no subscribers' lines on the waiting list for main lines were observed in 2000, while a significant increase was recorded in exchange capacity and subscribers' cables in 1998; it seems that the project has contributed to a certain extent to easing the tight condition of communication in the nine provinces and cities.

Table 2: Change in exchange capacity, number of subscribers' cables, and subscribers' lines on the waiting list for main lines in each province and city (unit: 1,000 lines)

			1990	1991	1992	1993	1994	1995	1998 completion of the project	2000
Tianjin	Exchange Capacity	Plan	240	277	320	370	427	493	N.A.	N.A.
		Actual	260	N.A.	N.A.	N.A.	N.A.	1,510	2,450	2,930
	Subscribers' cables	Plan	184	213	246	289	343	399	N.A.	N.A.
		Actual	150	N.A.	N.A.	N.A.	N.A.	830	1,660	2,410
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	10	N.A.	0
Shanghai	Exchange Capacity	Plan	600	665	700	720	857	1,020	N.A.	N.A.
		Actual	620	N.A.	N.A.	N.A.	N.A.	3,460	6,180	6,640
	Subscribers' cables	Plan	350	420	490	550	655	779	N.A.	N.A.
		Actual	460	N.A.	N.A.	N.A.	N.A.	2,230	4,310	5,300
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	450	N.A.	0
Guangdong	Exchange Capacity	Plan	150	172	198	227	261	300	N.A.	N.A.
		Actual	1,100	N.A.	N.A.	N.A.	N.A.	10,070	13,940	15,180
	Subscribers' cables	Plan	113	131	152	177	206	240	N.A.	N.A.
		Actual	1,030	N.A.	N.A.	N.A.	N.A.	5,910	9,580	14,000
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	70	N.A.	0
Heilongjiang	Exchange Capacity	Plan	119	144	163	173	183	203	N.A.	N.A.
		Actual	390	N.A.	N.A.	N.A.	N.A.	2,700	5,110	5,930
	Subscribers' cables	Plan	64	76	90	106	126	160	N.A.	N.A.
		Actual	280	N.A.	N.A.	N.A.	N.A.	1,570	3,410	4,860
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	50	N.A.	0
Fujian	Exchange Capacity	Plan	527	631	755	903	1,081	1,294	N.A.	N.A.
		Actual	310	N.A.	N.A.	N.A.	N.A.	3,520	5,470	6,880
	Subscribers' cables	Plan	520	617	721	844	987	1155	N.A.	N.A.
		Actual	230	N.A.	N.A.	N.A.	N.A.	1,690	3,470	5,610
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	0	N.A.	0
Shanxi	Exchange Capacity	Plan	471	471	726	986	986	986	N.A.	N.A.
		Actual	170	N.A.	N.A.	N.A.	N.A.	1,280	2,850	3,870
	Subscribers' cables	Plan	409	420	545	705	858	943	N.A.	N.A.
		Actual	120	N.A.	N.A.	N.A.	N.A.	680	1,820	3,450
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	350	N.A.	0
Jilin	Exchange Capacity	Plan	781	910	1,059	1,233	1,436	1,704	N.A.	N.A.
		Actual	290	N.A.	N.A.	N.A.	N.A.	2,010	3,660	4,730
	Subscribers' cables	Plan	508	608	718	858	1,008	1,168	N.A.	N.A.
		Actual	250	N.A.	N.A.	N.A.	N.A.	1,260	2,420	3,590
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	30	N.A.	0
Zhejiang	Exchange Capacity	Plan	640	760	900	1,040	1,190	1,350	N.A.	N.A.
		Actual	460	N.A.	N.A.	N.A.	N.A.	4,680	8,340	11,170
	Subscribers' cables	Plan	420	500	590	680	790	890	N.A.	N.A.
		Actual	410	N.A.	N.A.	N.A.	N.A.	2,600	5,020	8,820
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	30	N.A.	0
Jiangsu	Exchange Capacity	Plan	450	528	620	727	852	1,000	N.A.	N.A.
		Actual	600	N.A.	N.A.	N.A.	N.A.	5,940	12,900	15,650
	Subscribers' cables	Plan	320	380	460	550	660	780	N.A.	N.A.
		Actual	400	N.A.	N.A.	N.A.	N.A.	3,300	7,500	11,340
	Lines on the waiting list for main lines		N.A.	N.A.	N.A.	N.A.	N.A.	70	N.A.	0

Source: Materials of JBIC and China Telecom Group

2.3.2 Trend of telephone density

We understand the project has made a certain contribution to improving telephone density in the nine provinces and cities and in the nation. Viewing the trend of telephone density in the nine provinces and cities: in Tianjin, for example it has increased significantly from 12.09 (1996) to 40 at the time of the completion of the project (1998); and in Shanghai, from 23.31(1996) to 48 (1998) and 79 (1999). As for Heilongjiang, although telephone density can not be calculated because of the lack of data, a statistics almanac of the province shows that the number of telephone users has increased by 623,000 households in a year (1998-1999).

Moreover, subsequent to the increase of national telephone density from 3.2 (1994) to 10.64 (1998), the figure has increased, showing a wider breadth of upsurge, up to 25.9 in 2001. This figure has amounted to 2.6 times of the estimated national telephone density in 2001 (10) at the time of appraisal.

2.3.3 Financial Internal Rate of Return (FIRR)

FIRR was calculated as 12.3% at the time of appraisal. Premises for the calculation:

(1) Project life: 20 years

(2) Benefit: Toll revenue (out-city toll rate: 0.04 - 0.05 RMB/3 minutes)
Basic rate (8 - 10 RMB/Month)
Installation fee (2,000 – 3,000 RMB)
Lease line fee (14% of total telephone income)

(3) Cost: Investment fund for construction
Maintenance and operation (about 18% of revenue)
Tax (about 3% of revenue)

Recalculation of FIRR is not made in this evaluation because the data responding to above premises were unavailable.

2.4 Impact

2.4.1 Socioeconomic impacts

It is assumed that enhanced convenience in socioeconomic life in the targeted regions, derived from improvement in quality and reliability of telephone services, would have positive impacts on social welfare of residents and corporate activities including foreign capital.

2.4.2 Environmental impacts

In implementing the project, neither impact on social environment, such as land acquisition and involuntary relocation of residents, nor negative impacts on natural environment have been observed.

2.5 Sustainability

2.5.1 Operation and Maintenance

Initially, the agencies responsible for operation and maintenance of the project were: Ministry of Posts & Telecommunications, and Posts & Telecommunications Bureau of each provinces and cities. However, since 1998, China Telecom (Chinese Telephone and Telegraph Group Company) and its subsidiary in the nine provinces and cities has taken responsibility for it[1].

China Telecom controls 14 departments, 2 centers, 3 research institutes, 1 telephone directory company, and 31 regional subsidiaries, among which network construction and operation department is wholly in charge of maintenance of communication network including this project.

The network construction and operation department consists of 7 sections, among which the department directly in charge of maintenance of telephone network is facility maintenance section with scores of engineers (all engineers have academic background such as university graduate or above). These engineers are assigned to each region and engaged in controlling and directing facility maintenance sections of all provincial subsidiaries by keeping close contact with them. All employees of facility maintenance sections of provincial subsidiaries also have academic background such as technical college or above and have been implementing smoothly maintenance of communication network including this project.

Although organizational formation of the project implementation is going to change in accordance with the reorganization of China Telecom[3], significant change in technical capability of the facility maintenance section is not likely to occur.

In the meantime, as mentioned above, reorganization of China Telecom is now under way, and their financial data were thus unavailable.

[1] In 1998, the Ministry of Posts & Telecommunications and the Ministry of Electric Industries Bureau were integrated into the Ministry of Information and Industries. Triggered by the integration, Telecommunications Bureau, formerly belonged to the Ministry of Posts & Telecommunications, became Chinese Telephone and Telegraph Group Company (China Telecom), and Posts & Telecommunications Administration Bureau of each region became a company's subsidiary or a subsidiary's branch. Also, in 2002, China Telecom is being divided into Nangfang Company, which will succeed the name of Chinese Telecommunications company, and Beifang Company, which will be integrated with Chinese Network Communication Group Company. Shandong Telecommunications Company is going to be placed under the control of Beifang Company. Regarding subsidiaries in the nine provinces and cities, 3 subsidiaries in Heilongjing, Jilin, and Tianjin will belong to Beifang Company, while all other subsidiaries in 6 provinces and cities will belong to Nanfang Company.

Comparison of Original Plan and Actual Scope

Item	Plan	Actual
①Project Scope		
(1) In-city Exchange (lines)	765,000	790,000
Tianjin	125,000	125,000
Shanghai	120,000	120,000
Guangdong	180,000	180,000
Heilongjiang	60,000	60,000
Fujian	50,000	60,000
Shanxi	60.000	60,000
Jilin	40,000	40,000
Zhejiang	60,000	75,000
Jiangsu	125,000	125,000
(2) Out-city Exchange (lines)	30,320	20,820
Tianjin	4,400	4,400
Shanghai	4,500	0
Guangdong	4,720	4,720
Heilongjiang	2,500	0
Fujian	4,400	4,400
Shanxi	1,000	0
Jilin	1,500	1,500
Zhejiang	2,800	2,800
Jiangsu	4,500	4,500
(3) International Exchange (lines) Shanghai	1,400	0
(4)Optical Fiber Cable (center core・km)	32,277	33,272
(5)Mobile Communication Facility (System)	3	1
(6) Subscribers' cables (Pair・km)	2,228,000	2,459,866
②Construction Period		
(1) Procurement and Transportation of Facility	September 1992～July 1995	September 1992～June 1997
(2) Installation of Facility	February 1993～March 1996	February 1993～June 1998
(3) Construction of Buildings, Wiring, and Piping	January 1990～December 1995	January 1991～June 1994
③Project Cost		
Foreign Currency	55,338 million yen	43,117 million yen
Local Currency	25,581 million yen	20,313 million yen
(in RMB)	(1,093,190,000 RMB)	(1,093,190,000 RMB)
Total	80,919 million yen	63,430 million yen
ODA Loan Portion	55,338 million yen *	43,117 million yen
Exchange Rate	RMB1=JP¥23.4 (1992 Rate)	RMB1=JP¥18.58 (1992-1997 Weighted Average Rate)

* The figure of planned project cost includes the cost for the 4th phase of ODA loan (In the outcome, the 3rd ODA loan was enough to complete the whole process.)