China

Hainandao Development Project (Telecommunication) (1) (2)

Report Date: October 2002
Field Survey: July 2001

1. Project Profile and Japan's ODA Loan

Sit Map

Postal Telephone and Telegraph Management Office of Hainandao Traffic and Transportation Agency

1.1 Background

Hainandao, a former borough of Guangdong province, has played a roll as a supply base of raw materials for mainland China, but the development is quite slow because processing industries have not been promoted. In spite of its size, almost as large as Taiwan, and potentiality of natural resources (agricultural, aquatic, mineral, and tourist resources), GNP of the island, in 1988, was as low as 1.64% of Taiwan and GNP per capita was 5.26%, which indicate a distinctive delay in economic development. Under such situation, Hainandao was promoted to a province in April 1988 and designated as a special economic zone at the same time in order to facilitate rapid development of the economy by taking advantage of affluent resources; on the other hand, rapid development of basic infrastructure such as transportation and communication to stimulate introduction of foreign capital investment and tourism business has become indispensable. This project was taken up the 3rd ODA loan to China as part of infrastructure development, together with other road and port construction projects.

As of 1989, communication infrastructure of Hainandao was 22 in-city telephone stations and 39,140 lines of total in-city exchange capacity; and per 100 inhabitants line distribution rate was as low as 0.62%, which was fairly low compared with Chinese national average telephone density[1] (0.98%). To cope with the situation, Hainandao government planned and has been implementing a project to expand the in-city exchange capacity up to 73,100 lines by the first half of 1991. As for the out-city exchange, although 350 lines of digital exchange in Haifulu office (Haikou city) and microwave (M/W) transmission line connecting 7 western coastal cities of the island were introduced, the network had been unstable by shortage of capacity and typhoon damages because double-line carrier was used in the other regions of the island.

Hainandao had been trying to introduce foreign fund to develop the island, and a project to make Sanya city of the island as an international resort was proceeding. Thus, to respond with

expected rapid growth in demand for telecommunications, development of communication infrastructure by this project was considered to be an urgent issue.

1.2 Objectives

The project aimed to develop a telephone network in the island, a basis for economic development, connecting regions including central cities like Haikou and Sanya located in the south and north end of the island respectively.

1.3 Project Scope

(1) 105,000 lines of in-city exchange in 31 telephone stations including Haikou and Sanya
(2) 4,660 lines of out-city exchange (new lines) and transmission facilities in 12 telephone stations
(3) In-city cables for subscribers.

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

1.3 Borrower/Executing Agency

The government of the People's Republic of China / Posts & Telecommunications Bureau of Hainan Province, Traffic and Transportation Agency.

1.4 Outline of Loan Agreement

Item	Phase 1	Phase 2
Loan Amount	2,663 million yen	920 million yen
Loan Disbursed Amount	1,901 million yen	920 million yen
Exchange of Notes	December 1990	September 1991
Loan Agreement	January 1991	October 1991
Terms and Conditions		
Interest rate	2.5% p.a.	2.60%
Repayment (Grace) period	30 years (10 years)	30 years (10 years)
Procurement	General Untied	General Untied
Final Disbursement Date	February 1996	September 1996

Note: Loan amount of phase 2 is changed to 920 million yen in 1996 by amending L/A.

2. Results and Evaluation

2.1 Relevance

The objective of the project is ''to develop telephone network in the island'' to promote introduction of foreign fund, tourism, and economic development of Hainan province as well; the objective is consistently in line with Chinese development plan and policy from the time of appraisal up until now.

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

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

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

From the project scope, 30,000 lines of local exchanges and 300 lines of out-city exchange were reduced, and as for relay transmission facilities, main line and branch line facilities were excluded. The Hainandao development project consisted of communication section and road section. Due to its necessity for expansion as a result of the rapid increase in transport demand (road section), the scope of communication section has been reduced: priority was given to the road construction because of its urgency. The procurement of the excluded exchange facilities were financed and procured by the Chinese government, which was reasonable and did not affect the result of the communication section of the project.

2.2.2 Schedule

While planned construction period was January 1991 – December 1994, actual period was January 1991 – June 1998, which means that the project completion delayed by 3 years and 6 months. There are two main reasons for the delay: Chinese executing agencies are unfamiliar with procurement procedures of ODA loans; and processes from the installation of facilities through final inspection has delayed.

2.2.3 Project Cost

In accordance with the reduced project scope, loan disbursed amount of the foreign currency portion has reduced to 2,819 million yen from the original plan (8,048 million yen). Along with it, utilized amount of domestic fund also reduced to 180 million RMB from 206 million RMB.

2.3 Effectiveness

We can judge the objective of the project, development of telephone network in the island, is on the way of achievement considering from changes in the situation of installation and operation of the facilities, telephone exchange capacity, in-city cables for subscribers, subscribers' lines on the waiting list for main lines, and telephone traffic of Hainan province before and after the completion of the project.

2.3.1 Installation and Operation of Telephone Exchange System

The situation of telephone exchange system installation, which was main component in the project, is shown in the following Comparison of Major Plan and Actual Scope. These facilities introduced in the project so far operates without trouble, and average troubleshooting time is 0.01h/h, which is within the regulatory standards. These facilities are planned to be renewed one after another.

2.3.2 Changes in Telephone Exchange Capacity, Subscribers Lines, and Subscribers' lines on the Waiting List for Main Lines

Since 1994 (before completion of the project) the actual telephone exchange capacity and subscribers' lines in Hainan province exceeded the planned figure. Even after the completion of the project in 1998, they continued to keep on upward trend; in 2000 actual telephone exchange capacity and line cables for subscribers exceeded planned 7.1% and 19.1% respectively. Telephone exchange capacity has increased from 81,000 lines (1990) to 680,000 lines (1998). Subscribers' lines have increased from 41,000 (1990) to 434,000 (1998), which are 8.4 times and 10.6 times of expansion respectively. Concurrently, subscribers' lines on the waiting list for main lines have significantly decreased from 45,000 lines (in 1996) to 19,000 lines (in 1998) and 12,000 lines (in 2000).

Exchange facilities of this project began to be in service partially in 1996, and subscribers' lines increased from 30,000 lines (1996) to 56,000 lines (1998); exchange facilities accounted for 8.2% of subscribers' lines in the whole Hainan province. The share of subscribers' lines related with this project has declined since 1999 with a sharp increase in the number of users due to the expanded investment in communication infrastructure in the whole China including Hainan province. It can be concluded, however, that the project has contributed to a certain extent to easing tight situation of communication of whole Hainan province.

Table 3: Change in Telephone Exchange Capacity, Subscribers Cables, and Subscribers' Lines on the Waiting List in Hainan Province (Unit: 1,000 lines)

		1990	1991	1992	1993	1994	1995	1996	1997	1998 completion of the project	1999	2000	2001
Exchange Capacity	Plan	108	141	186	245	323	424	492	570	662	768	890	n.a.
	Actual	81	106	131	239	389	495	586	638	680	756	953	1300
Subscribers' cables	Plan	60	81	109	146	197	264	310	362	424	497	582	n.a.
	Actual	41	57	85	136	238	290	353	400	434	542	693	995
Exchange Capacity within the Scope of the Project	Plan	-	-	-	-	-	-	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Actual	-	-	-	-	-	-	75	75	75	75	75	75
Subscribers' cables within the scope of the Project	Plan	-	-	-	-	-	-	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Actual	-	-	-	-	-	-	30	45	56	60	63	63
Subscribers' lines on the waiting list for main lines	Plan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Actual	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	45	30	19	15	12	12

Source: data from Telecommunications company of Hainan Province

2.3.3 In-city traffic, out-city traffic, and international traffic

Although both in-city traffic and out-city traffic of Hainan province has once dropped in 1998 when the project has completed (compared with the amount in 1997), they took a turn for upward trend gradually, which seems to be a contribution of the project. Meantime, although no data before 1997 have been available, financial crisis in East Asia, subsequent to development boom in 1992-1996, prevented the economy from growth, which we believe, led to a reduction in the communication traffic in 1997-1998.

Table 5: In-city, Out-city, and International Telephone Traffic in Hainan Province

(Unit: 1 million calls/year)

	1997	1998 completion of the project	1999	2000	2001
In-city Traffic	1,879.96	1,679.61	1,823.85	2,050.78	n.a.
Out-of-city Traffic	123.67	114.88	95.65	146.75	n.a.
International Traffic	2.94	2.34	1.58	1.53	n.a.

Source: data from Telecommunications company of Hainan Province

2.3.4 Change in Telephone Density

Comparison between telephone density in Hainan province and planned figures shows the followings: although actual figures exceed planned ones since 1994, the trend has expanded since 1998 (completion of the project) and the telephone density in 2001 was 12.82%, remarkably over the planned target of 8.35%.

Table 6: Planned Target and Actual Result on Telephone Density

(Unit: Telephones/100 inhabitants)

	1990	1991	1992	1993	1994	1995	1996	1997	1998 completion of the project	1999	2000	2001
Plan	0.92	1.21	1.59	2.10	2.77	3.65	4.18	4.80	5.52	6.33	7.27	8.35
Actual	0.62	0.86	1.27	1.99	3.42	3.98	4.77	5.42	5.99	7.17	9.35	12.82
Breakdown:												
Haikou	n.a.	n.a.	n.a.	n.a.	30.75	33.58	35.88	38.23	39.37	44.00	52.00	57.78
Sanya	n.a.	n.a.	n.a.	n.a.	4.44	4.76	5.77	6.95	7.73	9.60	12.95	20.98
Tongshen	n.a.	n.a.	n.a.	n.a.	3.93	4.40	5.03	5.80	6.43	7.53	10.15	14.81
Qiongshan	n.a.	n.a.	n.a.	n.a.	2.79	3.10	3.83	4.54	5.01	6.29	8.43	11.73
Wenchang	n.a.	n.a.	n.a.	n.a.	1.27	1.68	2.43	2.82	3.36	4.03	6.11	9.45
Qionghai	n.a.	n.a.	n.a.	n.a.	1.77	2.27	3.20	3.76	4.47	5.67	7.78	12.23
Wanning	n.a.	n.a.	n.a.	n.a.	1.43	2.04	2.66	3.20	3.80	4.59	6.20	8.59
Ding'an	n.a.	n.a.	n.a.	n.a.	0.91	1.48	1.94	2.35	2.66	3.20	4.17	5.91
Tunchang	n.a.	n.a.	n.a.	n.a.	1.26	1.52	1.84	2.17	2.63	3.28	4.29	5.62
Chengmai	n.a.	n.a.	n.a.	n.a.	0.86	1.17	1.62	1.90	2.15	2.77	4.06	5.94
Lingao	n.a.	n.a.	n.a.	n.a.	0.64	0.89	1.35	1.47	1.74	2.37	3.10	4.30
Danzhou	n.a.	n.a.	n.a.	n.a.	1.05	1.22	1.88	2.56	3.00	3.65	5.45	10.08
Dongfang	n.a.	n.a.	n.a.	n.a.	1.32	1.72	2.19	2.69	3.27	4.17	5.42	8.71
Ledong	n.a.	n.a.	n.a.	n.a.	0.45	0.62	0.91	1.19	1.43	2.11	3.52	6.27
Qiongzhong	n.a.	n.a.	n.a.	n.a.	1.04	1.56	1.95	2.40	2.99	3.75	4.79	6.57
Baoting	n.a.	n.a.	n.a.	n.a.	1.07	1.46	1.93	2.45	2.87	3.55	4.79	7.31
Lingshui	n.a.	n.a.	n.a.	n.a.	0.77	0.99	1.29	1.62	1.95	2.48	3.55	5.37
Baisha	n.a.	n.a.	n.a.	n.a.	0.98	1.22	1.68	2.29	2.80	3.75	5.11	6.99
Changjiang	n.a.	n.a	n.a	n.a	1.16	1.39	1.85	2.54	3.23	4.33	5.70	8.07

Source: Data from Telecommunications company of Hainan Province

2.3.5 Financial Internal Rate of Return (FIRR)

In the appraisal of the project, FIRR was estimated as 8.8% under the following premises:

(1) Project Life: 24 Years

(2) Benefit: Toll revenue from in-city and out-city telephones

(3) Cost: Project Investment amount, operating capital, operation and maintenance cost, and tax

In this evaluation, FIRR was recalculated as 5.0%, using actual data for the benefit and cost factors in accordance with above-mentioned premises, on the following basis: Hainan province is going to renew, one after another, the facilities introduced in the project, and project life is shortened to 19 years.

2.4 Impact

This project aimed to contribute to inviting foreign investment and to developing tourism – which in turn will expand the economy of the island – by developing telephone networks in Hainan province. After the completion of the project, as shown below, a significant growth in tourism revenue of Hainan province and GDP has been observed; the project can be thus

evaluated to have contributed to the growth of the island in terms of infrastructure development.

2.4.1 Trend of Foreign Investment and Tourism Revenue

The received amount of direct foreign investment in Hainan province registered a decline in 2000, although once it increased in 1999 (after the completion of the project). Tough competition with other regions including Guangdong province with better investment climate, and Guangxi / Yunnan province subject to the benefit of western region development policy of the central government is considered to have caused such investment to decline. But, on the other hand, income from domestic and international tourism increased steadily; although the increase largely depends on unique tourism resources of Hainan province, improvement in infrastructural conditions including this project also considered to have contributed to it.

Table 7: Trend of Data Concerning Foreign Investment and Tourism Revenue

	1990	1995	1996	1997	1998 completion of the project	1999	2000
Direct Foreign Investment (Million Dollar)	100	1,060	790	710	720	790	140
Foreign Capital Introduction (Number of Cases)	252	389	239	227	174	158	184
Domestic Tourism Revenue (Million RMB)	N.A.	N.A.	N.A.	N.A.	5,897	6,378	6,951
International Tourism Revenue (Million Dollar)	27.17	80.98	85.42	N.A.	96.25	105.06	108.83

Source: Hainan Province Statistics Almanac

2.4.2 Growth Rate of GDP and Agricultural/Industrial Production

In 1988 (when the project was completed), GDP growth rate of Hainan province was higher than the previous year; since then, the rate continues to grow steadily exceeding the national level.

Table 8: Growth Rate of GDP and Agricultural/Industrial Production in China and in Hainan Province (Unit: %)

		1990	1991	1992	1993	1994	1995	1996	1997	1998 completion of the project	1999	2000
China	GDP Growth Rate	4.2	9.1	14.1	13.1	12.6	9.0	9.8	8.6	7.8	7.1	8.3
	Industrial Production Growth Rate	7.8	14.8	24.7	27.3	24.2	20.3	16.6	13.1	10.8	11.6	11.9
	Agricultural Production Growth Rate	18.5	6.5	11.0	20.9	43.6	28.5	10.3	6.3	2.9	0	1.6
Hainan Province	GDP Growth Rate	10.6	14.9	40.2	20.9	11.9	4.3	4.8	6.7	8.3	8.6	8.8
	Industrial Production Growth Rate	10.0	20.0	31.8	36.1	13.5	-5.9	6.1	8.8	9.6	7.7	6.1
	Agricultural Production Growth Rate	9.2	8.7	10.0	10.5	12.9	11.5	5.4	7.6	8.3	13.8	11.7

Source: China Statistics Almanac and Hainan Province Statistics Almanac

2.4.3 Environmental impacts

In implementing the project, there have been no impacts on social environment, such as land acquisition and involuntary relocation of residents, and no negative impacts on natural environment have been observed.

2.5 Sustainability

2.5.1 Operation and Maintenance

Although the operation and maintenance agency was assumed as Posts & Telecommunications Bureau of Hainan Province at the time of appraisal, the agency has changed to Hainan Telecommunications Company (a subsidiary of China Telecom) since 1998[2].

Operation maintenance department of Hainan Telecommunications Company, with 398 staff members, is in charge of maintenance of telephone and telegraph facilities of the entire company including this project. According to the executing agency, all the members of the department took suppliers' technical training and have passed a technical exam; the members are considered to be enough qualified for the maintenance of the project. (Financial data of the agency was unavailable.)

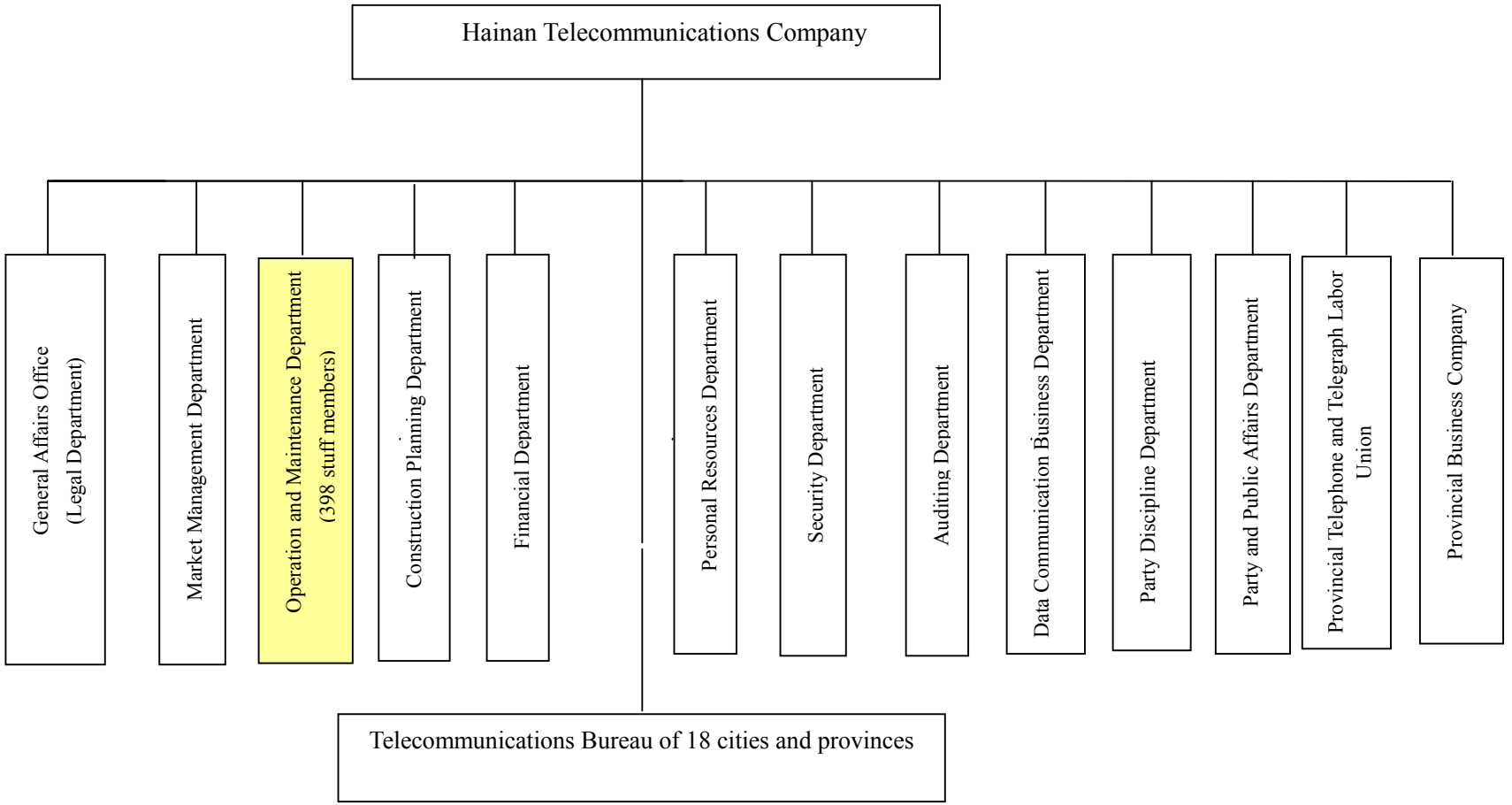
[2] In 1998, the Ministry of Posts & Telecommunications and the Ministry of Electric Industries Bureau were integrated into the Ministry of Information and Industries. Triggered by the integration, Telecommunications Bureau, formerly belonged to the Ministry of Posts & Telecommunications, became Chinese 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. Hainan Province Telecommunications company is going to be placed under the control of Nangfang Company.

Comparison of Original Plan and Actual Scope

Item	Plan			Actual		
①Project Scope						
(1) Exchange (lines)	Number of Stations	Local Stations (LS)	Toll Stations (TS)	Number of Stations	Local Stations (LS)	Toll Stations (TS)
Haikou	12	40,000	1,500	2	20,000	1,500
Wenchang	2	6,000	300	2	5,000	300
Qionghai	3	7,000	300	2	8,000	300
Wanning	2	5,000	240	2	5,000	240
Nada	2	9,000	500	2	9,000	500
Chengmai	1	5,000	350	1	7,000	350
Lingao	1	4,000	180	1	4,000	180
Lingshui	2	4,000	210	2	3,000	210
Sanya	3	10,000	300	0	0	0
dongfang	1	6,000	270	1	5,000	270
Changjiang	1	4,000	210	1	4,000	210
Tongshen	1	5,000	300	1	5,000	300
Total	31	105,000	4,660	17	75,000	4,360
(2) Transmission Facilities						
Eastern Main Line	・364km of optical fiber cable (Haikou – Wenchang -Qionghai – Lingshui - Sanya)			・364km of optical fiber cable (Haikou – Wenchang - Qionghai – Lingshui - Sanya)		
Central Main Line	・181km of microwave (Haikou – Ding'an – Tunchang - Tongshen)			・not implemented		
Western Main Line	・Expansion of digital multiplication device for existing microwave transmission line			・Expansion of digital multiplication device for existing microwave transmission line		
Branch Lines	・Optical fiber cable for 5 branch lines (Wenchang – Qinglangang,Wanning–Xinglong,Qionghai– Changpo, Qionghai – Lekuai, Lingshui – Xinchun etc.)			・implemented by domestic fund		
(3) Line Cables for Subscribers (pair・km)	280,000			280,000		
②Construction period	January 1991～December 1994			January 1991～June 1998		
Exchange Facilities Phase 1	February 1991～June 1993			January 1992～June 1998		
Phase 2	July 1991～November 1993			January 1992～June 1998		
Phase3	July 1992～November1994			not implemented yet		
Transmission Facilities						
Eastern Main Line	July 1991～December 1993			January 1992～December 1995		
Western Main Line	February 1991～January 1993			January 1992～December 1997		
Central Main Line	July 1992～June1994			not implemented yet		
Branch Lines	July 1992～June1994			not implemented yet		
Line Cables for Subscribers' lines	July 1991～December 1994			January 1992～December 1994		
Office Building	January 1991～June1992			January 1991～June 1992		
③Project Cost						
Foreign Currency	8,048 Million yen			2,819 Million yen		
Local Currency	7,074 Million yen			2,664 Million yen		
(in RMB)	(20,564 Million RMB)			(18,000 Million RMB)		
Total	15,122 Million yen			5,483 Million yen		
ODA Loan Portion	8,048 Million yen			2,819 Million yen		
Exchange Rate	RMB1=JP¥34.4(Rate of 1988)			RMB1=JP¥14.8 (1991-1997 Weighted Average Rate)		

Supporting material

Figure: Organization Chart of Hainan Telecommunications Company (as of July 2002)



Sourse: Hainan Telecommunications Company