Ex-Post Project Evaluation 2014:
Package II-1 (China)

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People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Broadcasting Infrastructure Improvement Project (Qinghai Province)"

External Evaluator: Yusuke Hasegawa, International Development Center of Japan Inc.

0. Summary

The goal of this project was to improve the quantity and quality of TV and radio programs in Qinghai Province by updating the broadcasting infrastructure and providing training to the staffs of the broadcasting stations. This would contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Qinghai, and also to the promotion of mutual understanding between China and Japan. The project was highly relevant to the development plans and development needs of China, especially in Qinghai Province, from the appraisal to the ex-post evaluation, and also to Japan's assistance policy for China at appraisal; therefore, the relevance of this project is high. While the project outputs were appropriately produced with some modifications to the original plan, the project cost exceeded that of the plan, and the project period was significantly longer than planned; therefore, its efficiency is low. The project significantly contributed to the improvement of the broadcast programs in quantity and quality, and has had a certain observable impact; therefore, its effectiveness and impact are high. No major problems have been observed in the institutional, technical, or financial aspects of the operation and maintenance system; therefore, sustainability of the project effects is high. In light of the above, this project is evaluated to be satisfactory.

1. Project Description

Project Location

Qinghai Radio and TV Station (QHBTV)[1]

1.1 Background

Broadcasting stations in China operate at the central, provincial, prefectural, and county levels and are supervised by the corresponding governments. In 2001, 94% of the population was covered by

[1] In September 2011, the Qinghai TV Station and the Qinghai Radio Station were merged into QHBTV. (Refer to "3.5 Sustainability.")

television broadcasting; and as an influential means of distributing information, broadcasting was already integrated into the everyday life of Chinese citizens. With a view to enhancing the development of its society and economy, the Government of China had been working on the improvement of information access and cultural enrichment, setting a target of more than 97% of the population in administrative villages to be covered by TV broadcasting by 2010.

The Province of Qinghai is located mostly on the Qinghai-Tibet plateau and had a population of 5.3 million in 2002, 45% of whom were from 33 ethnic minority groups such as Tibetans (Source: JICA). The province is endowed with mineral resources such as natural gas, oil, and non-ferrous metal; and its rich natural environment provides tourism resources and a variety of animals and plants such as medical herbs. Nevertheless, the economy of the province and people's living and educational standards had remained underdeveloped because of insufficient funding from the central government before the "Western Development" program was launched. Although the People's Government of Qinghai Province stressed the importance of broadcasting as a key to spreading knowledge of culture, education, disaster prediction and prevention, and science and technology, as well as to promote cultural exchanges, TV and radio stations in the province had been forced to create their programs by utilizing obsolete equipment because of a lack of funds.

Against this background, this project was implemented to improve the quantity and quality of broadcasting in Qinghai Province to contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Qinghai and also for the promotion of mutual understanding between China and Japan. In addition, the project planned to introduce Japanese broadcasting technology and equipment into China under the Special Terms for Economic Partnership (STEP)[2].

1.2 Project Outline

The objective of this project was to improve the quantity and quality of the TV and radio programs in Qinghai Province by updating the broadcasting infrastructure and providing training to the staffs of the broadcasting stations, thereby contributing to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Qinghai and also promote mutual understanding between China and Japan.

[2] JICA approved a total of six broadcasting projects under the STEP condition in China at the same time, including the Qinghai project. The target areas of the other five projects were Jinan City, Yunnan Province, Anhui Province, Jilin Province, and Ningxia Hui Autonomous Region.

<ODA Loan Project>

Loan Approved Amount/ Disbursed Amount	2,354 million yen / 2,353 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	March 2004 / March 2004	
Terms and Conditions	Interest Rate	0.75%
	Repayment Period (Grace Period)	40 years (12 years)
	Conditions for Procurement:	Main Contracts: Tied (Special Terms for Economic Partnership (STEP)) Sub Contracts: General Untied
Borrower / Executing Agency(ies)	Government of the People's Republic of China/ People's Government of Qinghai Province	
Final Disbursement Date	August 2012	
Main Contractor (Over 1 billion yen)	-	
Main Consultant (Over 100 million yen)	-	
Feasibility Studies, etc.	"Feasibility Study Report of Applying for Japanese Government Loan for Purchasing Qinghai Radio and Television Center's Equipment" by Radio, Film and Television Design and Research Institute (July 2003)	
Related Projects	None	

2. Outline of the Evaluation Study

2.1 External Evaluator

Yusuke Hasegawa, International Development Center of Japan Inc.

2.2 Duration of Evaluation Study

Duration of the Study: August, 2014 – January, 2016

Duration of the Field Study: November 9–18, 2014; January 25–28, 2015

3. Results of the Evaluation (Overall Rating: B[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of China

The Government of China has placed an emphasis on television and radio broadcasting as a means of ensuring people's cultured living in its five-year plans from the Tenth Plan (2001–2005) through

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

the Twelfth Plan (2011–2015). These plans aimed for informatization through developing an information infrastructure by constructing a nationwide digital TV broadcasting network, extending the coverage of TV and radio broadcasting, and developing digital broadcasts. The latest five-year plan of the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China (SAPPRFT), namely the Twelfth Plan, sets a target of having 99% or above of the population covered by TV and radio broadcasting by 2015. The Twelfth Five-Year Plan of Qinghai Province also plans to accelerate the construction of the next generation of information infrastructure such as integrated networks of telecommunication, broadcasting, and computers, and to extend TV and radio coverage in rural areas through the "Village to Village Project" in order to promote the delivery of public cultural services.

Thus, this project was in line with the development plans of China at the national and provincial levels from the time of appraisal through ex-post evaluation.

3.1.2 Relevance to the Development Needs of China

In 2002, Qinghai's income per capita was approximately 20% below the national average. The 2012 figure was 33,181 RMB, which still fell below the national average (38,459 RMB) by approximately 15%. In addition, there was a significant economic gap between urban and rural residents in the province that was clearly indicated by the fact that the disposable income of urban residents was 3.3 times higher than the net income of rural residents in 2012 (Source: *Qinghai Statistical Yearbook*). The provincial government recognizes the importance of broadcasting as a means of social services to bridge the gap, and this is reflected in the government's development plans. In particular, the provincial government as well as the broadcasting stations see a constant need to provide more extensive information on disaster and disaster prevention and to broadcast more programs in the Tibetan language, since the province received much attention in China and from abroad after the 2010 Yushu earthquake. The earthquake originated in the Yushu Tibetan Autonomous Prefecture, south of the province, and was widely reported.

Until around 2009 in Qinghai, broadcasting stations at the province and prefecture levels were faced with a shortage of funds, which constituted a serious obstacle to digitalizing broadcasting equipment. The central and provincial governments fully started to invest in the broadcasting sector from 2010 on, for instance, through the "Village to Village Project." Hence, the project had exactly met a financial need of the executing agency at the time of appraisal and implementation.

From a technical viewpoint, the necessity for adopting Japan's technology in the project is confirmed because the executing agency feels that Japanese broadcasting products, especially recording and editing equipment, have had technical advantages from the time of appraisal to ex-post evaluation, and that the products are suited to making high-quality programs in line with the digitalization policy of the government. With the ongoing rapid technological progress of broadcasting equipment and systems, the Qinghai Radio and Television Station (QHBTV) is currently facing new challenges such as replacement of equipment and facilities in response to

high-definition television (HDTV) technology.

Thus, this project was in line with the needs of China for enhancing the broadcasting sector and introducing Japanese technology from the time of appraisal through ex-post evaluation, and for the financial needs of the executing agency. Because of rapid progress in technology, the executing agency currently has another need for new equipment and facilities.

3.1.3 Relevance to Japan's ODA Policy

Japan's Economic Cooperation Program for China (October 2001) aimed to develop an environment to promote the market economy, to improve livelihoods in order to promote social development in the inland areas, and to enhance economic activities in the private sector.

The Medium-Term Strategy for Overseas Economic Cooperation Operations (2002–2005) of JICA (JBIC at that time), which was the policy of Japanese ODA loans at the time this project was appraised, emphasized the promotion of information technology to reduce the information gap in developing countries. In addition, the Country Assistance Strategy for China (2003) of JICA (JBIC at that time) stressed human resource development, particularly for regional revitalization and interactions, strengthening of market rules by utilizing Japan's experience through interactions with Japan's broadcasting stations (for example, through training and co-production of programs), and environmental conservation.

Thus, the orientation of these policies was consistent with a project that aimed to improve the livelihood and promote social and economic development by enhancing broadcasting in the inland areas of China.

This project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

The project outputs can be divided into three categories: a "hard" component that is mainly related to equipment and facilities, a "soft" component that includes training and other activities, and consulting services. The planned and actual project outputs are explained below.

(1) "Hard" Component (procurement of broadcasting equipment and facilities)

As a whole, broadcasting equipment and facilities were provided largely as planned. Although changes were made to some of the planned equipment and facilities, they are recognized as necessary and relevant in the light of the project objective. Main modifications were as follows:

- Some of the camera equipment for TV studios and the computer broadcasting system for radio were upgraded to models with higher specifications, and a portion of the planned equipment for small-scale studios was cancelled. This was done in response to the needs of

QHBTV at that time, when the planned procurement packaging was reorganized after the start of the project.

- The civil work portion of the procurement package for audio and studio decoration that was planned for purchase by the JICA fund was cancelled and transferred to the Chinese fund. This resulted from the Chinese government's policy on foreign-invested construction enterprises that was issued after the project started, which made it impossible for Japanese construction firms to serve as the prime contractor as required by the STEP condition of the project[5]. The cancelled amount was then redirected to cover the cost for an expanded digital TV monitoring system for the Qinghai Radio Film and Television Bureau[6], thus responding to the growing needs for digitalization.
- This project planned to provide broadcasting equipment and facilities not only to QHBTV (which was described as the target broadcasting station in the project summary document prepared by JICA) but also to the Qinghai Radio Film and Television Bureau and local broadcasting stations at the prefecture and county levels in the province. In fact, broadcasting equipment such as cameras was delivered widely to seven autonomous prefectures and prefecture-level cities and nine counties and county-level cities according to the plan[7]. After that, using the remaining balance of the approved loan amount, one additional procurement package was planned for the broadcasting station of the Hainan Tibetan Autonomous Prefecture, and broadcasting systems including HDTV equipment were delivered. The additional package focused on this particular broadcasting station in an attempt to create the most effect with limited resources, against the background that a new broadcast center for the station was being constructed with China's own fund at that time and that the station had a compelling need to broadcast more programs in the Tibetan language.

[5] The problem arose because of a notice issued by the Chinese Ministry of Construction (at that time) in September 2004, stipulating that it had ceased to accept applications from foreign-invested construction firms for initial registration or extension of registration as eligible entities. On the other hand, according to documents provided by JICA, the legal opinions issued by the Chinese Ministry of Foreign Affairs that were a precondition for the commencement of the loan agreement stated that there was no conflict with domestic laws. After the the Ministry of Construction issued its notice, the Chinese Ministry of Finance denied the application of the STEP condition to the civil works of this project. Based on the above information, it is considered that it was difficult to foresee the problem at the time of appraisal.

[6] The provincial administrative institution in charge of managing and supervising the broadcast and film industry.

[7] Broadcasting stations at Haixi Mongol and Tibetan Autonomous Prefecture, Haibei Tibetan Autonomous Prefecture, Hainan Tibetan Autonomous Prefecture, Huangnan Tibetan Autonomous Prefecture, Yushu Tibetan Autonomous Prefecture, Golog Tibetan Autonomous Prefecture, Xining City, Golmud City, Qilian County, Menyuan Hui Autonomous County, Ping'an County, Ledu County, Xunhua Salar Autonomous County, Tongde County, Zêkog County, and Guinan County. China's local administration is divided mainly into the following levels: 1) provincial level (province, autonomous region, municipality, etc.), 2) prefectural level (prefecture, autonomous prefecture, prefecture-level city, etc.), 3) county level (county, autonomous county, county-level city, etc.), and 4) township and village level (township, town, village, etc.).

Table 1　Project Outputs (“Hard” Component)

	Plan	Change	Reason
QHBTV (Television)	・Development of broadcast center (renovation of studios, air conditioners, etc.)	・Civil work portion was undertaken with the Chinese fund.	・Chinese government policy made it impossible for Japanese construction firms to serve as the prime contractor as required by STEP.
	・Studio equipment (digital cameras/recorders/editors, HDTV cameras/recorders, lighting, etc.) ・Broadcasting van ・Broadcast center building construction (procured by the Chinese fund)	・Part of the studio equipment, mobile satellite transmitter, and microwave transmitter were cancelled. ・HDTV broadcasting van was added. ・Studio cameras were upgraded/additionally procured.	・Revised prediction of the use of small-scale studios ・Mobile satellite transmitter and microwave transmitter were already purchased with the Chinese fund. ・Higher-grade equipment and system were introduced in response to technology advancement. (HDTV broadcasting system)
QHBTV (Radio)	・Studio equipment (recording system, duplicating equipment, computer broadcasting system, etc.) ・Broadcasting van	・Computer broadcasting system was upgraded. ・Some studios were changed to smaller-scale ones.	・Higher-grade equipment and system were introduced in response to technology advancement. (Computer broadcasting system) ・Revised prediction of the size and use of studios (Recording system)
Qinghai Radio Film and Television Bureau/ Local Stations	・Broadcast monitoring system ・Broadcasting equipment for local stations	・Broadcast monitoring system was upgraded. ・HDTV studio broadcasting system including cameras and recorders were additionally procured for the station of Hainan Tibetan Autonomous Prefecture.	・Higher-grade equipment and system were introduced in response to advances in technology (Improved monitoring function dealing with digital signals) ・A procurement package was added utilizing the balance of approved loan amount.

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency

(2) “Soft” Component (training for the staff of the broadcasting station, and other activities)

For its “soft” component, the project plan included training for the staff of the Chinese broadcasting station, co-production of programs and other collaborations between the Chinese and Japanese broadcasting stations, purchasing of programs produced in Japan, and so on. In reality, training and program co-production were implemented with some modifications to the plan, and

the changes are recognized as justifiable. On the other hand, collaboration between the Chinese and Japanese broadcasting stations and purchasing of Japanese-made programs were not realized. The details are explained below.

- The project originally planned to train the technical staff from QHBTV for one month (12 person-months in total). The training was actually provided to the staff of QHBTV as well as the Qinghai Radio Film and Television Bureau, and the training period was shortened to 7–10 days for each course (six person-months in total). The contents of the training were also changed: the revised program focused on discussions and negotiations with Japanese broadcasting stations and other organizations regarding the co-production and purchase of TV programs and other collaborations, in addition to site visits to manufacturers and broadcasting stations (Table 2). The reason for the changes was that the executing agencies preferred their technical staff to be away from work for a shorter period because the project implementation was being delayed, and the agencies gave priority to negotiations with Japanese broadcasting stations to materialize planned items such as collaboration and program purchases. The training program was judged to be appropriately changed according to the progress of the project.
- After the training program was completed, the executing agencies continued to discuss the possibility of co-productions with Japanese broadcasting stations. However, this was not realized because both sides were unable to reach agreement on the subject of the program, and the negotiations took too much time. The executing agencies then decided to cooperate with a Japanese production company to create a TV program. A program on the theme of cooperation between Chinese and Japanese villages working on the "One Village One Product" movement was produced and broadcast by QHBTV. The QHBTV staff participated in shooting on location in Japan and China.
- The principal reason for not succeeding in program purchasing was that tighter restrictions on importing and broadcasting foreign TV programs were placed by SAPPRFT, which supervises the Qinghai Radio Film and Television Bureau and QHBTV, at that time than at the time of appraisal. It was difficult for potential importers to predict what types of programs would be approved before applying to the authorities. At the time of ex-post evaluation, a very limited number of foreign programs, whether Japanese or not, were being broadcast by QHBTV. The other reasons provided by QHBTV were the high price of the programs and lack of capacity to re-edit the program for broadcast in China, such as translating into Chinese.

Table 2　Project Outputs (“Soft” Component)

	Plan	Change	Reason
QHBTV (Television)	・Training (camera technique: 1 month × 3 staff; editing: 1 month × 3 staff; transmission: 1 month × 3 staff) ・Collaboration with NHK and Hokkaido Broadcasting Co. Ltd. (HBC) ・Purchase of programs/broadcasting rights of programs produced in Japan ・Co-production of programs with Japanese broadcasting stations ・Obtaining of programs held by NIME-WORLD	・Number of person-months was shortened (visits to broadcasting stations and manufacturers etc.: 10 days × 9 staff; 7 days × 6 staff; 8 days × 6 staff) ・Co-produced TV program titled “Village Life” (45 min) with a Japanese production company ・Collaboration with Japanese broadcasting stations, purchase of programs/broadcasting rights of programs produced in Japan, and obtaining of programs were not implemented.	・Priority was given to discussions/negotiations on collaboration and program purchase. QHBTV requested their technical staff be away from work for a shorter period. ・Co-production with HBC was not implemented because of different interests for the theme and too much time consumed for negotiations. ・NHK provided a list of the programs available for sale, but the parties did not reach an agreement on purchasing Japanese-made programs. ・The main reasons for not implementing program purchase were restrictions on importing/broadcasting foreign programs and that the purchase was subject to approval by the authorities. The other reasons provided by QHBTV were the high price of the programs and lack of capacity to re-edit the program for broadcast in China.
QHBTV (Radio)	・Training (recording: 1 month × 1 staff; editing: 1 month × 2 staff) ・Purchase of music produced in Japan		

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency

(3) Consulting Services

Part of the consultant’s work was changed in accordance with a change in the procurement method for equipment and facilities that originally required pre-qualification (P/Q) of bidders. The P/Q step was removed during the implementation, in view of a significant delay in the procurement process. At that point, it had been two and a half years since the loan agreement was signed, mainly because procurement packaging was revised during the initial stage of the project. According to the document provided by JICA, the estimated amount of each revised package was below a specified allowable level, and post-qualification reviews were conducted instead of P/Q to ensure the quality of contractors. Thus, the change in procurement method was considered to be relevant for the purpose of speeding up the procedures.

Table 3　Project Outputs (Consulting Services)

Plan	Change	Reason
(Support in procurement) ・Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ・Evaluation of P/Q results ・Preparation of tender documents ・Evaluation of tender results (Support in training and others) ・Training in Japan ・Co-production of programs with Japanese broadcasting stations ・Purchase of Japanese programs and broadcasting rights	・Preparation of P/Q documents and evaluation of P/Q results were removed. Instead, support for post-qualification (document preparation and evaluation) was conducted.	・Procurement method of equipment and facilities was changed from International Competitive Bidding (ICB) with P/Q to ICB with post-qualification.

Source: Documents provided by JICA; interview with Executing Agency

(4) STEP's Effects on Outputs

The Customer Satisfaction Survey for the STEP Loan, which was conducted with the executing agencies, reveals that the executing agencies are relatively satisfied with the content and technical level of the procured equipment and facilities. During interviews with the executing agencies, they recognized that the equipment and facilities have contributed to the improvement of their entire broadcasting infrastructure. On the other hand, the executing agencies observed that the procurement process of the STEP loan takes a long time. They also expressed their view that procurement costs would have been lower if Chinese firms had been allowed to work as the prime contractor, even when purchasing the same Japanese-made products.

As stated above, the original plan of the project included civil work undertaken by the JICA fund. However, the civil work part was transferred to the Chinese fund because of the Chinese government's policy on foreign-invested construction enterprises that was issued after the project started, which made it impossible for Japanese construction firms to serve as the prime contractor as required by the STEP condition of the project. The cancelled amount was then shifted to an expansion of equipment and facilities. Since the civil work part had constituted only a portion of a single procurement package, the effect of the change on the outputs was judged to be minimal over the entire project.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The estimated project cost at appraisal was 3,971 million yen in total, of which the Japanese ODA loan was to be used for the foreign currency portion amounting to 2,354 million yen, and the remaining 1,617 million yen was to be funded by the Chinese side for the local currency portion.

Although the local currency portion included the costs for constructing the new broadcast center and for purchasing some broadcasting equipment, the evaluator was not able to obtain the precise data on the actual cost of broadcasting equipment spent under the local currency portion. Hence, the exact amount of the actual total cost was not revealed[8]. Estimating from the available information such as the construction cost obtained from the executing agencies, the actual cost of the project amounted at least to 4,100 million yen (103% of the plan) and exceeded the planned amount. The actual amount disbursed from the Japanese ODA loan was 2,353 million yen, corresponding to 100% of the planned loan.

Table 4 Project Cost (Unit: million yen)

	Plan				Actual			
	FC(*1)	LC(*1)	Total		FC	LC	Total	
	JICA fund	Non-JICA fund	Total	JICA fund	JICA fund	Non-JICA fund	Total	JICA fund
Broadcasting equipment	2,121	342	2,463	2,121	2,298	18(*3)	2,316	2,298
Training	13	0	13	13	8	0	8	8
Price escalation (*2)	68	0	68	68	-	-	-	-
Contingency	110	17	127	110	-	-	-	-
Consulting services	42	0	42	42	47	0	47	47
Other (construction of broadcast center)	0	1,258	1,258	0	0	1,729	1,729	0
Total	2,354	1,617	3,971	2,354	2,353	1,747	4,100	2,353

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency
Exchange rate: 1 RMB = 14.3 yen at appraisal;
1 RMB = 13.7 yen at ex-post evaluation (average during the loan period), applied to "broadcasting equipment";
1 RMB = 13.1 yen (the 2004 average), applied to "Other (construction of broadcast center)." Broadcast center was completed in 2004.
Note: (*1) FC: Foreign currency; LC: Local currency
(*2) Contingency fund to cover cost rises caused by price increases
(*3) The amount disbursed by the Qinghai Radio and Film and Television Bureau

The procurement of equipment and facilities was originally planned to be implemented in three packages according to the organization where the equipment and facilities would be delivered: QHBTV (radio station), QHBTV (TV station), and the Qinghai Radio Film and Television Bureau. In August 2006, the total number of packages was changed to 10 by dividing the equipment and facilities into smaller packages based on their types and functions.

As explained in 3.2.1, one package was added in 2012 to target a broadcasting station at the

[8] QHBTV did not recognize the expenses related to the local currency portion of this project separately from the other spending on equipment and facilities. This was done because of the changes and modifications made during project implementation such as the removal of civil work and some of the equipment from the Japanese fund and the adjustment of quantity or quality in response to changes in needs. From interviews with the Qinghai Radio Film and Television Bureau, the bureau disbursed 1.3 million RMB in relation to this project, and a total of 132 million RMB was spent on constructing the broadcast center until 2004.

prefecture level using the remaining balance of the approved loan amount. The purpose of the change in 2006 was to encourage more bidders to participate and to make the bidding process smoother. At that point in time, two and a half years had passed since the loan agreement was signed, and some of the planned equipment had already been purchased by the Chinese fund. In addition, some facilities such as smaller-scale studios were predicted to be utilized less frequently than originally planned. Thus a part of the planned equipment and facilities were cancelled. On the other hand, some other equipment and planned facilities were upgraded or expanded in response to advances in technology. For example, while canceling individual pieces of equipment that were relatively low in value, such as equipment for small-scale studios and a mobile transmitter, the project intended to introduce higher-grade systems such as an HDTV broadcasting van and related cameras and studio equipment to meet the needs of the executing agency. This was done while carefully considering the balance of the adjusted outputs and costs. As a whole, the project cost was considered to meet the actual outputs.

Table 5 Procurement Packages: Plan and Actual (Unit: million yen)

Package	Plan at appraisal	Revised plan in August 2006	Actual	
	Total	Total	Total	(Reference) Japanese product ratio (%)
1. Radio Station	118	-	-	-
2. TV Station	1,068	-	-	-
3. Radio and TV Bureau	933	-	-	-
1. Radio System	-	124	131	29
2. TV Integrated Service Networks	-	301	311	0
3. TV Audio Equipment	-	48	133	40
4. TV Video Equipment	-	403	216	97
5. Newsgathering Vehicle	-	35	43	100
6. Mobile High-Definition Television Studio System	-	553	477	51
7. Lighting System for TV Studio	-	65	74	0
8. TV and Radio Monitor System	-	159	180	26
9. Acoustic Decoration of Studio	-	317	366	4
10. Radio and TV Equipment for Grassroots Areas	-	179	230	60
11. Radio and TV Equipment Comprehensive Package	-	-	129	21
Total	2,120	2,188	2,296	36

Source: Documents provided by JICA
Note: Amount of money was rounded down to one million yen. Percentage was rounded to unit.

3.2.2.2 Project Period

The project period[9] was significantly longer than planned. The project period planned at

[9] The completion of the project was defined as the completion of all components, i.e., equipment and facilities, training, and consulting services. The completion of equipment and facilities was the date of delivery when completed by the contractor,

appraisal was 70 months. The actual period was 125 months, which was 179% of the planned period. Consulting services and procurement of the equipment started at later dates than planned by 16 months and 32 months, respectively. The actual period of procurement of the equipment was 86 months compared with the planned 36 months.

Table 6 Planned and Actual Project Period

	Plan	Actual
Entire Project	March 2004 (L/A signed)–December 2009 (70 months)	March 2004–July 2014 (125 months) (179% of the plan)
a) Procurement of Equipment	October 2004–September 2007	June 2007–July 2014
b) Training	October 2004–December 2009	Training: November 2007–December 2008 Joint program creation: June 2012–August 2012
c) Consulting Services	April 2004–December 2009	August 2005–June 2012

Source: Documents provided by JICA; interview with Executing Agency

The significant extension of the project period was generated cumulatively across the entire process of the project, from the consulting contract to the revising of the procurement packages, and to the procurement process of each package. Judging from the views of the involved parties and confirmed documents, major factors that affected the delay are as follows:

1) The selection process for a consultant such as the pre-qualification (P/Q) procedure took a longer time than anticipated.
2) As stated above, procurement packages were substantially revised, and the contents to be procured were adjusted before the procurement process began.
3) During the procurement process for individual packages, additional procedures had to be taken for some equipment and facilities to modify the specifications in response to technological advances.
4) Since this project was one of the first Japanese ODA Loan Projects under the STEP condition in China, smooth implementation was not necessarily ensured by the executing agency or JICA in the early stages.
5) In 2009, the Chinese Ministry of Finance issued a circular notice on the implementation of Japanese ODA Loan Projects (Cai Bian Jin [2009] No.38). This notice tightened the rules for the approval process when a procurement plan was to be changed. The more stringent rules

and the completion of training was the date when Chinese trainees returned to China and Japanese experts returned to Japan (documents provided by JICA). The completion of consulting services was defined by the evaluator as the final day of the consultant's work.

included strict adherence to assessment procedures and securing of a long enough preparation period before applying for an extension. This required more time to go through the process than in the past.

For example, here is a particular case related to the procurement of individual packages: Because of trouble that developed after the procurement contract was signed between the executing agency and the supplier, it took four years from the signing of the contract in late 2008 to the completion of delivery in 2012 for the procurement of Package 6, which included an HDTV broadcasting van. The trouble was caused by a revision of the tax system in China during the process of importing and delivering the equipment and parts in the package. The change in the treatment of tax exemption for some equipment and parts caused confrontations between the two parties as to the payer and the method of required payment. This slowed the entire delivery process and necessitated revisions to price and specifications of major equipment and parts. However, neither party was able to proceed to arranging for a revision because of their confrontation. JICA, having made an effort to resolve the standoff, organized a meeting in September 2011 that was attended by the two parties and other related parties. The meeting made a breakthrough that led to the completion of delivery. According to QHBTV, the station was greatly affected by this entire process because, in addition to the additional taxes it had to pay, it needed to spend a large amount of its own financial resources to make alterations to the HDTV broadcasting van to fill the technological gap after the contractual process had stagnated.

When a problem arises after the procurement contract is concluded, it should be solved primarily between the contracting parties, namely the executing agency and the supplier. Nevertheless, this provided a case where intervention of a third party other than the direct contracting parties contributed to solving the problem.

3.2.3 Results of Calculations of Internal Rates of Return (Reference Only)

This project was designed to cover a broad range of effects such as the provision of broadcasting equipment, training, a mutual understanding between China and Japan through co-production and procurement of programs, and raising awareness of environment, hygiene, and market rules. Since these items cannot be measured quantitatively and comprehensively, it was not possible to calculate the internal rate of return at appraisal and at ex-post evaluation.

In summary, the project cost exceeded the planned cost, and the project period significantly exceeded the planned period. Therefore, efficiency of the project is low.

3.3 Effectiveness[10] (Rating: ③)

Effectiveness was analyzed from the aspects of quantitative effects including operation and effect indicators (broadcast coverage, number of viewers, etc.) defined at the time of appraisal and the

[10] Sub-rating for Effectiveness is to be included with the consideration of Impact.

qualitative effects concerning the improvement of the quality of broadcasting.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

Although the verification of quantitative effects is to be conducted by comparing the actual performance and the target values set for one year (or two years for some indicators) after project completion as defined at the time of appraisal, it was not possible at the time of the ex-post evaluation to obtain the data that showed the actual performance achieved one year after project completion because the project was completed in 2014. However, the delivery of equipment in this project was completed in 2012 except for that of the final package, which was procured additionally using the remaining fund to target lower-level broadcasting stations. We therefore conduct our verification by comparing the newest available data from 2013 and the target values.

As shown in Table 7, broadcast coverage and the number of TV viewers in Qinghai Province, as operation and effect indicators, both greatly exceeded the target values. Broadcast coverage reached 97% (vs. the target value of 90%), and the number of TV viewers grew to 1.57 million households (vs. the target value of 1.12 million households). However, these effects are considered to reflect the direct contribution of the expansion of broadcasting networks caused by the investment of the Chinese government. This project, whose goal was to improve stages of program production such as information gathering and editing, is considered to have made only an indirect contribution. In fact, broadcast coverage exceeded the target value of 90% in the mid-2000s, when the procurement for this project had not yet begun[11]. Therefore, verification is conducted for the quantitative indicators listed for reference purposes that are considered to have stronger associations with the improvement of program production, in addition to the operation and effect indicators (Table 8).

Table 7 Operation and Effect Indicators

	Baseline	Target	Actual		
	2003	2010	2010	2012	2013
	Baseline Year	1 Year After Completion			(Latest Year)
Broadcast Coverage in Qinghai (%)	89.6	90.0	95.03	96.33	96.93
TV Viewers in Qinghai (10 thousand households)	97.5	112.0	n.a.	154.0	156.7

Source: Documents provided by JICA and Executing Agencies; *Statistical Yearbook of China*

Among these indicators listed for reference purposes, more than 80% of the items achieved the target values in 2013 for both TV and radio. In particular, items such as the share of independently produced programs; the number of programs related to disaster, environmental conservation, and public health; and the number of programs targeting children showed a steady increase. According to

[11] Broadcast coverage in Qinghai was 92.5% in 2005. (Source: *Statistical Yearbook of China*)

QHBTV, the broadcasting equipment procured in this project accounts for approximately two-thirds of the station's entire equipment inventory for program production based on the number of pieces. This indicates that the equipment provided by this project greatly contributed to the improvement of the production process of QHBTV's programs.

The number of TV channels, which is one of the indicators that did not achieve its target values, has not changed from four from the time of appraisal because new approval has not been obtained. On the other hand, a new radio channel called the "Life Channel" was set up. Currently, QHBTV does not purchase or broadcast programs produced in foreign countries. The principal reason mentioned by QHBTV was the difficulty in planning to broadcast these programs because the number and broadcasting hours of foreign programs were strictly regulated. In addition, broadcasting all of these programs had to be approved in advance by the higher administrative bodies of China such as SAPPRFT. Other reasons pointed out by QHBTV included the generally high costs of buying foreign programs directly, a lack of capacity to reprocess the programs such as dubbing on its own, and a lack of experience with direct importing. On the other hand, there is also a shared understanding that broadcasting foreign content could increase the attractiveness of the station and thereby its earning power in an environment where there is a growing competition with other TV stations (such as satellite channels in the other provinces) over attracting a greater audience. It is presumed that QHBTV intended to purchase Japan-made programs at least to a certain extent, since the training session of the project had as one of its purposes a discussion of this issue with Japanese broadcasting stations, as stated above. Judging from the above information, the regulations of the authorities mostly affected the results of program purchasing.

Table 8 Other Indicators

		Baseline	Target	Actual		
		2003	2010	2010	2012	2013
		Baseline Year	1 Year After Completion			(Latest Year)
Number of education programs (programs/year)	T	14	16 (*)	17	18	18
	R	4	6 (*)	8	8	8
Broadcasting hours per day of education programs (hours/day)	T	11.3	12.4(*)	12	14	14
	R	2	4(*)	4.4	5	5
% Share of independently produced programs (%)	T	9.86	15 (*)	15	20	20
	R	60	66(*)	72	80	80
Number of independently produced programs (programs/year)	T	2,371	2,736	2,430	2,740	2,740
	R	40,880	54,100	53,220	54,300	54,300
Number of channels (channels)	T	4	6	4	4	4
	R	4	5	4	5	5
Broadcasting hours (hours/year)	T	21,900	27,740	27,740	27,740	27,740
	R	21,298	26,621	26,280	35,040	35,040
Number of programs related to disaster management (programs/year)	T	364	380	390	410	410
	R	730	912	907	979	979
Number of programs related to environmental conservation (programs/year)	T	208	218	237	240	240
	R	2,920	3,650	3,840	3,907	3,907
Number of programs related to public	T	208	312	314	321	321

		Baseline	Target	Actual		
		2003	2010	2010	2012	2013
		Baseline Year	1 Year After Completion			(Latest Year)
health (programs/year)	R	2,920	3,650	3,694	3,812	3,812
Number of programs related to the development of market economy (programs/year)	T	160	160	163	164	164
	R	730	912	914	920	920
Number of programs produced in other countries (programs/year)	T	624	624	0	0	0
	R	94	114	0	0	0
Number of programs produced in Japan (programs/year)	T	219	238	0	0	0
	R	38	67	0	0	0
Number of programs targeting ethnic minority groups (programs/year)	T	312	468	480	484	484
	R	5,840	7,300	7,473	8,243	8,243
Number of programs targeting women (programs/year)	T	414	466	468	501	501
	R	1,095	1,369	1,396	1,427	1,427
Number of programs targeting children (programs/year)	T	104	104	280	310	365
	R	547	684	580	650	787

Source: Documents provided by JICA and Executing Agencies; *Statistical Yearbook of China*
T: Qinghai TV Station; R: Qinghai Radio Station
Note (*): It is indicated in the JICA document that these are target figures for 2008 and "two years after completion."

3.3.2 Qualitative Effects

The use of equipment and facilities procured in this project at QHBTV improved the quality of broadcast through the diversification of program production tools, enhancement of production techniques, promotion of business operations, and so on. Appreciation of QHBTV's programs from viewers and concerned persons has generally been improving. In concrete terms, the following qualitative effects are observed:

- The HDTV Outside Broadcasting Van made it possible to flexibly produce and broadcast quality programs. Some examples are as follows: 1) on-site reporting was conducted as part of the special memorial program on the 2010 Yushu earthquake that was aired by China Central Television (CCTV) in 2013; 2) location shooting for a popular TV variety show, "Men and Women Climb the Highland" (total 40 parts; Satellite Channel), produced jointly with Anhui Television, was conducted; 3) live broadcasts of political events such as the People's Congress and the People's Political Consultative Conference of the province, and large-scale sporting events such as "The Tour of Qinghai Lake," which is an international road cycling race.
- Technological transition from analog to digital equipment realized as a full-scale digital system in all stages of recording, editing, and airing. This improved the quality of the picture and video image.
- The improved stationwide operational network generated an efficient operation model in accordance with the times. For example, a production system using no video tapes was realized, and a nonlinear editing system[12] was introduced. This improved the efficiency of a series of

[12] Computer-based editing system dealing with digitalized data, which does not require "linear work" such as rewinding and fast-forwarding of videotapes according to the time flow.

work processes, saving the cost and time of recording, editing, and airing.

- The appreciation of governmental bodies in the country concerning the programs produced by QHBTV has been improving. In the period from 2012 to 2013, 37 and 64 programs won awards from the state and province, respectively. For instance, QHBTV's documentary program titled "Looking Development: Brilliant Words" was selected by SAPPRFT as one of "The 18 Excellent Chinese Documentary Programs of the Communist Party."
- The audience rate survey of TV programs in Xining City shows that QHBTV's "Qinghai News Report" received an average rating of 3.5% and was ranked third among news programs, and "People's One Hour" received a rating of 2.8% and became the sixth-ranked news program in 2013 (Source: *China TV Rating Yearbook*). While most of the top-ranking programs in this genre were nationally-broadcast shows produced by CCTV, the programs produced by QHBTV are considered to have been chosen for the citizens of Xining because of their closeness to people's daily lives.
- The answers from the beneficiary survey[13] also confirmed the qualitative and quantitative improvement of the programs of QHBTV. The survey results indicated that the station's TV programs concerning education, culture, and living improved in comparison with programs of 5 to 10 years ago in the following aspects (in decreasing order of the appreciation of TV viewers): (i) increase in the number of programs; (ii) provision of more local information; (iii) usefulness to broaden knowledge; and (iv) provision of more easily understood programs. Radio programs were also highly evaluated by listeners in the following aspects (in decreasing order): (i) provision of more local information; (ii) increase in the number of programs; (iii) provision of more easily understood programs; and (iv) usefulness to broaden knowledge.

On the other hand, a direct link between the activities conducted as part of the soft component and the improvement of broadcast quality was not found. As stated in "3.2.1 Project Outputs," the training of the technical staff was shortened, and the contents of the training were modified. This was done to focus on the meetings with Japanese broadcasting stations to promote collaboration and on site visits to manufacturers and broadcasting stations. The purchasing of programs produced in Japan, and co-productions between the broadcasting stations of both countries, were not realized.

Some of the technical staff at QHBTV who participated in the training commented that they found the training useful because they could gain knowledge on the latest equipment and facilities. The technical staff also exchanged information and viewpoints with Japanese engineers at the manufacturers of broadcasting equipment that were visited as part of the training program. However, considering that this experience does not necessarily indicate a direct connection with the equipment and facilities procured in this project, and that the training was conducted for a limited period of time, the contribution of the training to the improvement of program production at QHBTV is thought to

[13] The beneficiary survey was conducted in December 2014 in Xining City, and Hainan Tibetan Autonomous Prefecture (Gonghe County and Guide County), using questionnaires administered by researchers. Valid answers were obtained from 100 people in total (64 males and 36 females). The questionnaire mainly consisted of questions regarding TV and radio viewing and listening behavior, evaluation of QHBTV programs, and knowledge and interest in foreign countries (U.S., Korea, and Japan) via broadcasting.

have been limited on the whole.

The effects of some activities in the soft component on a mutual understanding between Japan and China will be explained below in "3.4 Impacts."

Setting Up the HDTV Broadcasting Van for Broadcast (QHBTV)

Inside of HDTV Broadcasting Van (QHBTV)

3.4 Impacts

3.4.1 Intended Impacts

(1) Advancement of Education, Cultural Enrichment, and Knowledge Enhancement for Qinghai Citizens

As stated above, the number and broadcasting hours of programs related to education, culture, and social and living information have been increasing from the time of appraisal. According to QHBTV, the station is always adjusting the contents and expression techniques of these programs to the social situations and needs of the audience. For example, the number of programs related to disaster prevention has increased since the earthquake in 2010, and weather forecasting programs now include disaster warnings and geological hazard information.

The Tibetan channel, which is mainly broadcast in the Tibetan language and one of two satellite channels operated by QHBTV, has remarkably expanded according to the needs of the people in the Tibetan ethnic minority group. When the channel launched in 2006, daily broadcasting was limited to only two hours, of which one hour was for programs broadcast in Mandarin Chinese. Currently the channel broadcasts 18 hours a day. Throughout China, there are three Tibetan channels operated by different province-level TV stations. All programs on QHBTV's channel are produced in the Amdo dialect of the Tibetan language. Thus, the QHBTV Tibetan channel serves as useful means of accessing information by the Amdo Tibetan people who, according to QHBTV, have the largest population (2.6 million) of all dialect groups in a total population of approximately five million. For example, "Road to Wealth" is broadcast by this channel to provide a variety of information on livestock farming and daily living for the Tibetan people. Apart from QHBTV, in the broadcasting station of the Hainan Tibetan Autonomous Prefecture where the equipment and facilities were provided by this project, two thirds of the independently produced TV programs are in Tibetan. From our interview with the station, these programs are appreciated enormously by the Tibetan

residents, especially elderly people, whose mother tongue is not Chinese.

As mentioned above, our beneficiary survey also ascertained that QHBTV programs related to education, culture, and social and living information are appreciated by the audience because of the wealth of the number of programs, closeness to the locality, enhancement of knowledge, and easy understanding and so on. In particular, the respondents named TV programs such as "Legal Program," "Qinghai News Report," "People's One Hour," and radio programs such as "Political Hotline" and "Downtown Story." These are all recognized as useful programs to obtain information or knowledge that is closely related to the viewers' daily lives.

From the above information, QHBTV is strengthening awareness of the people through the enhancement of programs related to culture, education, and social and living information. QHBTV is also making an effort to respond to the needs of society with an increase in programs about disaster prevention after a big earthquake hit the province, and by expanding its programming to improve the information access of ethnic minority groups. The audience is also utilizing the programs to increase knowledge and to obtain useful information for their daily lives. We therefore conclude that beneficial impacts have been achieved by the project.

Delivered Studio Equipment and Facilities
(Hainan Tibetan Autonomous Prefecture)

Delivered Japanese-made Studio Camera
(Hainan Tibetan Autonomous Prefecture)

(2) Promotion of Mutual Understanding between Japan and China

The 45-minute TV program "Village Life," which was co-produced with a Japanese production firm in 2012, was aired approximately twice on QHBTV's satellite channel and its terrestrial channel, respectively. The theme of the program was the cooperation between Chinese and Japanese villages working on the "One Village One Product" movement. Although the program content was relevant to the deepening of mutual understanding between Japan and China, information on concrete responses from viewers after the broadcasting was not obtained.

Some technical staff of QHBTV who participated in the training in Japan commented that they were impressed by the earnest and diligent attitude of Japanese workers at the broadcasting stations and manufacturers they visited.

On the other hand, we conducted a beneficiary survey to find out how the media changed the

people's impression of and interest in Japan. Since QHBTV's airing of Japanese-made programs has been extremely limited for the last five years, our questions did not address particular broadcasting stations. The respondents obtain their information about Japan mostly from news programs from CCTV out of all types of TV programs. The answers concerning the frequency of gaining knowledge of Japan from TV programs compared with 5 to 10 years ago were "no change" for 53% of respondents, "increased" for 23%, and "decreased" for 4%. The answers concerning changes in the impression of Japan as seen in TV programs compared with 5 to 10 years ago were "no change" for 41%, "became better" for 14%, and "became worse" for 21%. When the same question was asked concerning viewers' impressions of the United States and Korea, more people answered "no change" (54% and 57%, respectively) and fewer answered "became worse" (7% and 1%, respectively).

Because the purchasing and airing of programs concerning Japan have been extremely limited, it is considered that this project had a very limited impact on deepening the understanding of Japan among citizens of Qinghai in general. However, as stated above, some of the participants in the training as part of this project deepened their understanding of Japanese people by observing the work attitude of Japanese workers and engineers at broadcasting stations and companies.

(3) Strengthening of Collaboration Between Japanese and Chinese Broadcasting Stations

There were no identified cases of collaboration between QHBTV and Japanese broadcasting stations being strengthened through this project. The TV program "Village Life" was co-produced with a Japanese production company in 2012. A portion of the video pictures used in the program was provided at no charge by the Oita Broadcasting System (OBS), but there has been no cooperation with OBS after this. It is presumed that the momentum to pursue collaborations with foreign broadcasting stations was not generated because there was no purchasing of Japanese-made programs or co-production with Japanese broadcasting stations in the project, which was also affected by other factors such as the policy and regulations of the upper authorities and the resource limitations of QHBTV.

3.4.2 Other Impacts

Other positive impacts include the fact that the advertising revenue of QHBTV has been increasing since 2009 when Qinghai TV Station and Qinghai Radio Station were merged into QHBTV. The advertising revenue of the TV section, which accounts for approximately 80% of the total advertising revenue, has grown at a rate of more than 10% annually. QHBTV associates this with the increase in the viewer ratings of certain programs owing to the improved production level.

Construction of the new broadcast center for QHBTV was completed in 2004, and the center became fully operational. No impact on the natural environment arising from this project has been identified. This project did not involve the acquisition of new land or the relocation of inhabitants.

As discussed above, target values were attained for the majority of quantitative indicators defined for the purpose of verifying the effects of this project. Qualitative indicators also confirmed improvements in the quality of programs by improving various program production technologies and methods. Although some of the planned impacts were missing or limited, it was found that programs responding to the needs of society were produced and utilized for the daily lives of the people.

Based on the above information, this project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

In September 2011, the Qinghai TV Station and the Qinghai Radio Station were merged into QHBTV, and the Qinghai Radio Film and Television Bureau and QHBTV became organizations that are equally ranked at the same level of administration. As a result, the respective organizations operate and maintain the equipment and facilities provided to them in this project. In addition, the equipment and facilities delivered to local broadcasting stations such as the station in Hainan Tibetan Autonomous Prefecture are maintained by each station.

At QHBTV, under the supervision of the Deputy Technical Manager, the Technical Maintenance Department controls the overall system of operation and maintenance. The Maintenance and Repair Division in the department serves as the contact point with production and other departments. Each of these departments is responsible for operation and maintenance of the equipment and facilities it owns. In the Qinghai Radio Film and Television Bureau, the Secretariat Office and the Monitoring Center are in charge of operating and maintaining the LAN network system and the TV and radio monitoring network system, respectively.

As stated above, owing to the reorganization of administrative bodies that was undergone after the project started, the Qinghai Radio Film and Television Bureau and QHBTV became equally ranked organizations in the administration. However, the division of responsibility for the equipment and facilities procured in this project has been clearly organized. Although it was observed at the time of the ex-post evaluation that the transfer of some records and documents for radio equipment to QHBTV had not been completed, the transfer work is ongoing between the bureau and QHBTV, and there is no particular problem identified for the future. Thus, no institutional problems are found in operation and maintenance.

3.5.2 Technical Aspects of Operation and Maintenance

QHBTV has a total of 125 engineers (31 senior-level, 51 middle-level, and 43 entry-level engineers) and technicians. The technical staff is assigned to the Technical Maintenance Center or production departments and works on the operation and maintenance of the equipment and facilities procured in this project. The Qinghai Radio Film and Television Bureau has nine engineers (six senior-level and three middle-level engineers) of approximately 40 staff members working in the

main functions of the bureau.

In QHBTV and the bureau, protocol documents or manuals for ordinary operations and emergencies are prepared on the use of the equipment and facilities generally and individually. For example, manuals regarding the duty and emergency plan of the General Operation Network Center, technical regulations and procedures on program making, regulations on operation and maintenance of production machines and equipment, manuals on the use of nonlinear editing systems for each manufacturer were identified at QHBTV. In addition, the emergency plan for the LAN system room, regulations on the operation and maintenance of general equipment, and regulations on the duty system of operation and maintenance were found in the bureau. The main protocol documents and manuals are located on the wall of the premises so that the staff can easily check them. These documents and manuals are utilized during in-house training, as explained below.

Training for operation and maintenance is first provided to the staff of the executing agencies by manufacturers or integrators of the equipment and facilities. For example, engineers of QHBTV participated in the training for the HDTV broadcasting van that was held in Beijing by the manufacturer. In addition, QHBTV provides its own training to its staff. Recently, in-house training was conducted about nonlinear editing. QHBTV considers the qualifications for an engineer as one of the criteria for employing its technical staff, but it also sets a regulation that requires personnel to pass two kinds of exams for them to be assigned to the person in charge of managing equipment and facilities.

In summary, the technical staff is being fostered with the combination of various means such as training by manufacturers, in-house training by QHBTV, and on-the-job training. In addition, internal exams are provided by QHBTV so that appropriate employees are involved in operation and maintenance. From the above, it is considered that the presence of sufficient technology for operation and maintenance is ensured.

Broadcast Control and Monitoring Center
(Qinghai Radio Film and Television Bureau)

Nonlinear Editing Room with Operation Manual
(QHBTV)

3.5.3 Financial Aspects of Operation and Maintenance

With regard to QHBTV's business operation, concrete figures for revenue and expenditures were

not obtained from QHBTV during the ex-post evaluation. Therefore, the analysis in this section is based mainly on the information on the financial structure and its trends that were acquired during interviews with QHBTV and the Qinghai Radio Film and Television Bureau. According to QHBTV, the revenue of the station is composed of advertising revenue, revenue from the business operations of affiliated organizations, and subsidies from the government. The advertising revenue has been on the increase for the last five years. In particular, the advertising revenue of the TV section, which accounts for approximately 80% of the total advertising revenue, has grown at a rate of more than 10% annually. The subsidy from the provincial government is divided into two components: ordinary funding whose amount is fairly stable every year, and a special fund that can be provided depending on the government programs. The latter has been showing an increasing trend. This entire situation has resulted in a growth in total revenue. The budget for operation and maintenance usually accounts for approximately 10–15% of the total annual budget. There were no major problems identified during the interviews about operation and maintenance and the updating of the equipment and facilities. The expense for operation and maintenance during the latest year was 15.3 million RMB (241 million yen).

At the time of the ex-post evaluation, QHBTV was planning to upgrade its entire broadcasting system to respond to HDTV broadcasting by the end of 2014. However, it was anticipated that the largest part of the required budget would be financed by the government, and that a small portion would be invested by the station.

From the above information, combined with the situation stated below in "3.5.4 Current Status of Operation and Maintenance," the necessary funding is secured and a large amount of investment in upgrading is not expected. Therefore, it is considered that the financial sustainability of operation and maintenance is guaranteed.

3.5.4 Current Status of Operation and Maintenance

According to QHBTV, the equipment and facilities procured in this project are maintaining a stable operation. There are still equipment and facilities that were delivered recently, such as the Total Operation Network System and the HDTV broadcasting van. Most of the purchase contracts stipulate that necessary consumable and precision parts will be provided for one to three years after initial delivery by the supplier. In addition, QHBTV is letting contracts for maintenance services with the manufacturer after the guaranteed period of all the procured equipment. Daily checkups of the equipment and facilities are carried out by the Technical Maintenance Department, and there have been no major problems with repairing of the equipment or securing of spare parts.

While some of the equipment and facilities in the project, which were delivered during the early period of the project, were already updated to newer versions, these updating activities have been conducted without any major problems from technical as well as financial aspects.

In summary, sufficient action is taken for operation and maintenance on a daily basis, and equipment is updated as necessary. Therefore, it is considered that operation and maintenance are

performed appropriately.

No major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance system. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The goal of this project was to improve the quantity and quality of TV and radio programs in Qinghai Province by updating the broadcasting infrastructure and providing training to the staffs of the broadcasting stations. This would contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Qinghai, and also to the promotion of mutual understanding between China and Japan. The project was highly relevant to the development plans and development needs of China, especially in Qinghai Province, from the appraisal to the ex-post evaluation, and also to Japan's assistance policy for China at appraisal; therefore, the relevance of this project is high. While the project outputs were appropriately produced with some modifications to the original plan, the project cost exceeded that of the plan, and the project period was significantly longer than planned; therefore, its efficiency is low. The project significantly contributed to the improvement of the broadcast programs in quantity and quality, and has had a certain observable impact; therefore, its effectiveness and impact are high. No major problems have been observed in the institutional, technical, or financial aspects of the operation and maintenance system; therefore, sustainability of the project effects is high. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

In November 2014, the broadcasting station of Hainan Tibetan Autonomous Prefecture commenced full-scale operations of its new broadcast center, thus beginning the operation of all equipment and facilities procured in this project. This project has played a significant role in developing the broadcasting infrastructure and enhancing the levels of producing and broadcasting technology across Qinghai Province, in the sense that broadcasting equipment and facilities were provided not only to QHBTV (a province-level station) but also to a number of local stations in seven autonomous prefectures and prefecture-level cities and nine counties and county-level cities through the Qinghai Radio Film and Television Bureau. Since this is an appropriate timing to reflect on the 10-year cooperation project between Japan and China having born fruit, and the contribution of this project to the tireless efforts of the central and provincial governments of China to enhance the quality and quantity of broadcasting, we recommend that the executing agency implement public relations activities concerning this project.

4.2.2 Recommendations to JICA

The final procurement of equipment and facilities in this project was completed in July 2014 with a delivery to the broadcasting station of Hainan Tibetan Autonomous Prefecture, which commenced full-scale operations of its new broadcast center in November 2014. The station is equipped with a modern HDTV broadcasting system, including studio equipment for Chinese and Tibetan broadcasts and program production systems. These have contributed greatly to the improvement of the local broadcasting station. This is considered to be a suitable opportunity to publicize the information regarding the cooperation between the two countries for supporting the broadcasting infrastructure from the local level. We therefore recommend that JICA place relevant information on its website.

4.3 Lessons Learned

(1) Strengthening of Information Sharing During the Implementation of the Project Involving Quickly Changing Technology

The project took approximately eight and a half years from the signing of the loan agreement to the conclusion of the contract for the final procurement package, and more than 10 years to the completion of delivery. This significantly exceeded the planned period. It is necessary to implement a project in areas that face rapid progress in technology such as broadcasting, taking into consideration that the more the project is prolonged, the wider the gap in technical needs that is created between the needs at the planning stage and those at the time of delivery. When the delivery process of a procurement package in this project slowed considerably because of trouble that developed between the executing agency and the supplier (which was caused by a revision of the tax system in China made during the implementation of the project), JICA's active involvement in the situation led to the completion of delivery. This implies that active intervention of a third party during conflict between contracting parties could become an effective means to ensure a smooth execution of procurement contracts.

In addition, for more effective involvement, the third party must be able to sense the problem as early as possible. Thus, JICA, together with the supervising agency or other organizations of the partner country, should pay special attention to developments in the procurement process by keeping in close contact with the executing agency and supplier in projects that involve equipment that may become technologically obsolete. While it would be difficult to set a uniform arrangement of communication because the supervising system of Japanese ODA loan projects is different from country to county, possible measures include regular meetings involving a broad range of concerned parties on an individual project basis. Another option is to establish a reporting system among the interested parties to share information whenever necessary, without requiring "regular" meetings.

(2) Importance of the Assessment of Achievement and Risk in Highly Difficult Soft Component

The soft component planned in this project included training, the purchase of Japanese television programs, and co-productions with Japanese broadcasting stations. Unlike the hard component, in

which procurement is conducted based on a more or less concrete plan, the soft component in this project involved challenging activities that aimed to promote mutual understanding between Japan and China on the basis of many uncertain factors such as business decisions of the broadcasting stations in both countries, negotiations between broadcasting stations, and the policies of both countries. In planning such a difficult soft component, it is necessary to carefully locate and assess the extent of risks to achievement, beginning at the time of appraisal. In particular, if the activities in the soft component are susceptible to the direct impact of policies and regulations, such as licensing and approval of the government, we need to conduct information processing and analysis in advance that focuses on feasibility. For example, a major factor that impeded the purchase of Japanese programs in this project was the policies and regulations of the Chinese authorities. According to the documents provided by JICA, although the past records of the purchase of foreign-made programs was confirmed, the possibility of restrictions on purchases or imports was not recognized as an explicit risk at the time of appraisal, and a survey on relevant policies and rules was commissioned after the beginning of the project.

For a highly difficult soft component, setting high goals at the time of planning to maximize the effects of a bilateral cooperation project is a strategy that should not be rejected. On the other hand, proper recognition of the risks that can greatly affect the manifestation of effects and sufficient sharing of this recognition between the two countries in advance would provide the basis for a common understanding among the people from both countries as to how much success would be probable in reality. Explicit indication of such risks at the time of appraisal would also facilitate a convincing ex-post verification of the actual results.

(3) Relevant and Effective Public Relations for the Project

In the documents provided or the press release disclosed by JICA on this project, the project was summarized as targeting QHBTV (Qinghai TV Station and Qinghai Radio Station at the time of appraisal). An explanation about the cooperation to be rendered to the stations at the prefecture and county levels was omitted. In reality, in addition to the broadcasting station at the province level, namely QHBTV, the equipment and facilities were provided to the local stations of seven autonomous prefectures and prefecture-level cities and nine counties and county-level cities. Referring to a list of procuring items that were initially planned, cooperation with local broadcast stations was included in the project plan, indicating that the project essentially aimed to enhance broadcasting of the entire province that covered lower-tier administrative bodies. The equipment and facilities provided in this project when the broadcasting stations in Qinghai (especially at the local level) were faced with a shortage of funds were highly appreciated. However, an entire picture of the project has not necessarily been shown explicitly outside the province in China or in Japan. When JICA implements public relations activities in starting a new project, it should consider providing information adequately and proactively on the project's role in, and contribution to, the development of the partner country, fully considering the effect of dissemination.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs "Hard" Component	<Qinghai TV Station> ・Development of broadcast center (renovation of studios, air conditioners, etc.) ・Studio equipment (digital cameras/recorders/editors, HDTV cameras/recorders, lighting, etc.) ・Broadcasting van ・broadcast center building construction (procured by the Chinese fund)	<Qinghai Radio and TV Station> ・Development of broadcast center (renovation of studios, air conditioners, etc.) ・Civil work related to renovation of studios (procured by the Chinese fund) ・TV studio equipment (digital cameras/recorders/editors, HDTV cameras/recorders, lighting, etc.) ・HDTV broadcasting van ・broadcast center building construction (procured by the Chinese fund)
	<Qinghai Radio Station> ・Studio equipment (recording system, duplicating equipment, computer broadcasting system, etc.) ・Broadcasting van	・Radio studio equipment (recording system, duplicating equipment, computer broadcasting system, etc.) ・Radio broadcasting van
	<Qinghai Radio Film and Television Bureau/Local Stations> ・Broadcast monitoring system ・Broadcasting equipment for local stations	<Qinghai Radio Film and Television Bureau/Local Stations> ・Broadcast monitoring system ・Bureau's operation network system ・Broadcasting equipment for local stations (cameras, recorders, editors)
"Soft" Component	<Qinghai TV Station> ・Training (camera technique: 1 month × 3 staff; editing: 1 month × 3 staff; transmission: 1 month × 3 staff): Total 270 person-days ・Collaboration with NHK and Hokkaido Broadcasting Co. Ltd. (HBC) ・Purchase of programs/broadcasting rights of programs produced in Japan ・Co-production of programs with Japanese broadcasting stations ・Obtaining of programs held by NIME-WORLD	・Negotiations with/site visits to broadcasting stations and manufacturers, etc.: 10 days × 9 staff; 7 days × 6 staff; 8 days × 6 staff): Total 180 person-days ・Co-produced TV program titled "Village Life" (45 min) with a Japanese production company ・Collaboration with Japanese broadcasting stations, purchase of programs/broadcasting rights of programs produced in Japan, and obtaining of programs were not implemented. ・Obtaining of programs held by NIME-WORLD was not implemented.

	<Qinghai Radio Station> ・Training (recording: 1 month × 1 staff; editing: 1 month × 2 staff): Total 90 person-days ・Purchase of music produced in Japan	・Purchase of music produced in Japan was not implemented.
Consulting Services	(a) Support in procurement ① Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ② Evaluation of P/Q results ③ Preparation of tender documents ④ Evaluation of tender results (b) Support in training and others ① Training in Japan ② Co-production of programs with Japanese broadcasting stations ③ Purchase of Japanese programs and broadcasting rights	(a) Support in procurement ① Preparation of detailed design (D/D) and post-qualification documents ② Preparation of tender documents ③ Evaluation of tender results (b) Support in training and others ① Training in Japan ② Co-production of programs with a Japanese production company
2.Project Period	March 2004–December 2009 (70 months)	March 2004–July 2014 (125 months)
3.Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 2,354 million JPY 1,617 million JPY (113 million RMB) 3,971 million JPY 2,354 million JPY 1 RMB = 14.3 JPY (As of September 2003)	 2,353 million JPY 1,747 million JPY (133 million RMB) 4,100 million JPY 2,353 million JPY 1 RMB = 13.7 JPY (Average between 2003 and 2012; applied to broadcasting equipment) 1 RMB = 13.1 JPY (2004 average; applied to building of broadcasting station)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Broadcasting Infrastructure Improvement Project (Yunnan province)"

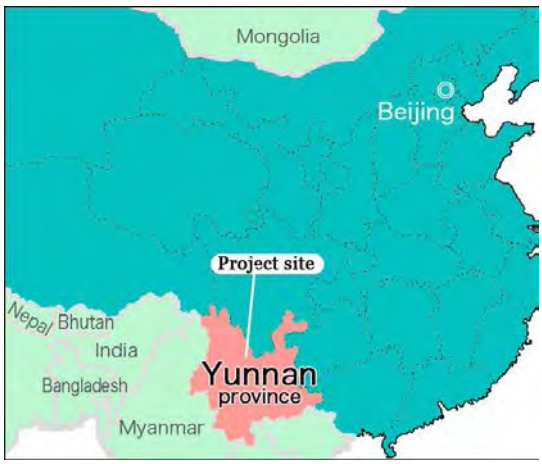
External Evaluator: Atsushi Tsukui, International Development Center of Japan Inc.

0. Summary

The objective of this project was to improve television and radio broadcast programs in Yunnan province, in terms of both quantity and quality, by replacing equipment at both Yunnan TV Station (hereinafter called YTVS) and Yunnan Radio Station (hereinafter called YRS) as well as implementing the training in Japan, thereby contributing to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens of Yunnan province, and the promotion of mutual understanding between Japan and China. This project is closely related to China's development plans, development needs, and Japan's ODA policy; therefore, its relevance is high. Additionally, the project cost was within the plan; however, the project period significantly exceeded the plan. Therefore its efficiency is fair. Both the population coverage rate and the viewership set as the project target criteria steadily increased, which evidences the project effectiveness. The efficiency of the program production is improved through the use of the procured digital equipment. The effectiveness of the training in Japan, such as the introduction of the Japanese open-plan studio, and the discussion style among citizens or intellectuals on radio programs has been observed; the improvement of the quality of broadcasting services (both in hardware and software) has contributed to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens, especially for ethnic minority people of Yunnan; therefore, the effectiveness and impact are high. Regarding the sustainability of the project, the status of the organizational, technical, and financial aspects have been stable and sufficient. In this way, the sustainability of the effectiveness of the project is high.

Based on the above facts, this project is evaluated to be highly satisfactory.

1. Project Description



Project Location

Yunnan TV and Radio Station

1.1 Background

Broadcasting stations in China exist at the (1) central, (2) provincial/municipal/ autonomous-regional, (3) prefectural, and (4) county levels and are supervised by the corresponding governments. In 2001, the percentage of population coverage in the whole country was 94% for television, which meant that the broadcasting services had attained their mission of information provision, cultural enrichment, and advancement of education for the citizens to some extent. For the sake of further socioeconomic development, the government aimed at the improvement of information delivery and cultural enrichment to people by setting a target of 97% population coverage for television by 2010.

Yunnan province, the target area of the project, had a population of 62,870,000 people (in 2001), comprising 25 ethnicities (documents provided by JICA). Its location has specifically historical and geographical characteristics: its border is shared with Myanmar in the west and with Laos and Vietnam in the south and south-east; additionally, the province lagged behind the socio-cultural development of the coastal areas. In 2001, there were approximately 7 million poor people. The Yunnan government established policies for the provision of cultural knowledge, education, disaster forecasting/prevention, and technology to the people through the broadcasting sector in its development plan. However, YTVS and YRS suffered from disadvantageous conditions for creating quality programs because they lacked digital equipment and facilities, caused by many years of financial shortages.

Based on the background above, the project aimed at the improvement of broadcasting programs in Yunnan both in quantity and quality to contribute to the advancement of education, cultural enrichment, and knowledge enhancement for citizens, and also, to deepen mutual understanding between Japan and China. Further, the project planned to

introduce Japanese broadcasting technology and equipment to China through the Special Terms for Economic Partnership (STEP)[1] program.

1.2 Project Outline

The objective of this project is to improve the quantity and quality of TV and radio programs in Yunnan by replacing broadcasting equipment and providing training in Japan to the staff of the broadcasting stations. In this way, the project contributes to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens of Yunnan, and also to the promotion of mutual understanding between Japan and China.

<ODA Loan Project>

Loan Approved Amount/ Disbursed Amount	3,008 million yen / 3,005 million yen	
Exchange of Notes Date / Loan Agreement Exchange Date	March 2004 / March 2004	
Terms and conditions	Interest rate: Repayment period: (Grace Period Condition for Procurement:	0.75% 40 years 12 years) Tied (Special Terms for Economic Partnership(STEP))
Borrower / Executing Agency	Government of the People's Republic of China / People's Government of Yunnan province	
Final Disbursement Date	August 2012	
Main Contractor (Over 1 billion yen)	Marubeni Corporation (Japan)	
Main Consultant (Over 100 million yen)	-	
Feasibility Studies: F/S, etc.	F/S by Yunnan Engineering Consulting Institute (July 2003)	
Related Projects	-	

2. Outline of the Evaluation Study

2.1 External Evaluator

Atsushi Tsukui (International Development Center of Japan Inc.)

[1] Six projects (including this project) were adopted at one time as broadcasting sector projects in China. The other five projects were those in Jinan city in Shandong province; Qinghai, Anhui, Jilin provinces; and Ningxia Hui autonomous region.

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – January 2016

Duration of the Field Study: December 14 – 22, 2014; March 9 – 11, 2015

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of China

The government of China has placed emphasis on the broadcasting sector as a measure for enhancing people's cultural lives, and has set out policies for enhancing population coverage rates, quality of broadcasting programs, and upgrading information infrastructure including the broadcasting sector. These policies have consistently been retained in the Tenth Five-year Plan of China (2001-2005) at the appraisal to the Twelfth Five-year Plan of China (2011-2015) at the ex-post evaluation. The Twelfth Five-year Plan of China has placed emphasis on the policy of "Village to Village," which aims for the provision of public services to all rural areas and has endeavored to enhance broadcasting services. From 2010 onward, the government has pushed ahead with a policy that fuses the existing mass media, including broadcasting, to the Internet. This plan is named "Fusion of the three nets".

The Twelfth Five-year Plan of Yunnan province (2011-2015) established the following policies for the broadcasting sector: (1) the promotion of "Fusion of the three nets" (telegraph, radio/TV, and Internet) and building up the next generation of stable, broad-band information integration systems; (2) to raise the population coverage rate of radio and TV to more than 97% and 98% respectively; additionally, to achieve 100% of these rates in small villages with less than 20 households in remote areas, and to expand the full-scale use of digital TV in urban areas; (3) to develop the cultural content industry through the use of the Internet; (4) to build the capacity for production, translation, and broadcasting of radio and TV programs and films for ethnic minorities and to develop publications for them; and (5) to promote the policies of "Village to Village" and "Household to Household" (dissemination of broadcast programs to households that have difficulties receiving broadcasts by providing satellite communication facilities).

Based on the policies above, the consistency between the development policies of national and provincial governments and the project has been maintained from appraisal to ex-post evaluation.

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ③: High, ② Fair, ① Low

Da Yu Tang village, a model village for the "Household to Household" policy in an ethnic minority community in Yuanyang County

Broadcasting programs are provided to the ethnic minority households by distribution of satellite antennas as part of the "Household to Household" policy

3.1.2 Relevance to the Development Needs of China

At the time of appraisal, because there are 25 ethnic minorities living in Yunnan, the government of Yunnan province aimed at human resource development and learning opportunity creation through the advancement of education and cultural programs on community-based radio and TV. For the development of Yunnan province, it was essential to provide broader groups of people with learning opportunities (such as advanced life-long education/ distance education) by improving the quality of broadcasting programs through the renovation of broadcasting equipment and facilities.

As of the ex-post evaluation, the GDP per capita of Yunnan province was 25,083 yuan, well below the national average of 41,908 yuan (roughly 60% of it). In 2013, the after-tax income per capita in urban areas was 23,226 yuan, whereas the net income per farmer was 6,141 yuan (the government of China's report, "Yunnan Province People Economic and Social Development Bulletin 2013"). Although it was not possible to simply compare the two income indicators, the disparity of income between urban people and farmers is quite considerable. YTVS and YRS have pushed ahead with the plan of expanding equipment and facilities for broadcasting to reinforce provision of educational and cultural content for the correction of these disparities. They are moving ahead with the construction of the Center of Ethnic Language Radio Television Broadcasting of Yunnan and Yunnan Comprehensive Radio Television Broadcasting Center to provide valuable, varied information to citizens, including ethnic minority people, in the province. Furthermore YTVS and YRS must upgrade their facilities and software, and increase human resource development to make full use of "new media", an internet delivery technology, to comply with the central government's policy of "Fusion of the three nets".

Based on the facts above, Yunnan province had and has the need for the enhancement

of opportunities for citizens through broadcasting programs, human resource development for local communities, and building manpower capacity in the broadcasting sector at the both appraisal and ex-post evaluation stages.

3.1.3 Relevance to Japan's ODA policy

"Economic Cooperation Program for China" (October 2001) by the government of Japan at the time of project appraisal set out policies such as the promotion of market-oriented economic reform, environmental arrangement for the extension of economic relationships in the private sector, and the promotion of mutual understanding between people in both countries. The Medium-Term Strategy for Overseas Economic Cooperation Operations of JICA emphasized human resource development and the correction of income disparity by reducing the information gap. The project also aimed at the reduction of the information gap, human resource development, and mutual understanding between the two countries through the reinforcement of the broadcasting sector.

Based on the facts above, this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

There are two aspects of project output in YTVS and YRS: (1) upgrading "hard" components (improvement of devices and infrastructure for broadcasting) and (2) strengthening "soft" components (delivery of training to staff). A comparison between the plan and the actual output is as follows.

(1) Upgrading "hard" components (improvement of devices and infrastructure for broadcasting)

Table 1: Planned and Actual Project Outputs ("Hard" Components)

Organization	Plan	Modification	Cause of modification
YTVS	・Studio equipment (digital video cameras/recorders, digital editing machines, monitors, etc.) ・Mobile unit car	・Although products were modified in terms of their specifications, their functions were not changed.	・Because the specifications and prices of products at time of the appraisal had changed when the executing agency procured them.
YRS	・Studio equipment (digital audio recorders/ editing machines, audio work stations, transmission devices, etc.) ・Engineering/ maintenance car		

Source: Documents provided by JICA and the executing agency and interviews with YTVS and YRS

It took two years from the appraisal to the first package procurement, during which technological innovation progressed. Consequently, the procurement of the equipment was modified, as in Table 1. The specifications of the equipment were changed, while remaining within the loan amount. No change in terms of the function or intended purpose of the equipment resulted.

Digital video camera (YTVS)

Digital audio recorder (YRS)

(2) "Soft" components (the training in Japan)

In the soft components, the technical training courses were conducted for engineers at YTVS and YRS; management training courses were also conducted for administrative personnel. The comparison between the planned and actual training is as follows (Table 2).

Table 2: Planned and Actual Project Outputs ("Soft" Components)

Organization	Plan	Modification	Cause of modification
YTVS	・Training in Japan (Camera technique: 1 month × 5 persons, equipment maintenance technique: 1 month×4 persons, media management: 1 month × 4 persons, newest technology: 1 month × 5 persons) ・Coalition with Fujisawa city (friendship city) ・Collaboration such as the coproduction of the TV program with Japanese broadcasting station (with Chukyo TV, Chiba TV, and TV Nagasaki) ・Purchase of TV content such as Japanese programs and broadcast rights	・5 batches of the training courses in Japan for the total of 38 experts in divisions such as broadcast management, editing, broadcasting techniques, industrial development for the duration from 10 to 14 days. Consequently the training for 475 man-days in total was conducted. ・Regarding the coproduction of a TV program with a Japanese TV station, it was replaced by a coproduction with a Japanese production company. ・Purchase of Japanese TV programs, broadcast rights, and Japanese music were not implemented.	・The duration of the training course was shortened and the number of trainees was increased because it was deemed to be sufficient for technical staff to acquire the skills to operate the procured equipment by receiving instructions from manufactures at the time of equipment delivery, and that more engineers needed to share a common understanding of capability, extensibility, and utility of the high definition technology. ・Collaboration with a Japanese broadcasting station and cooperation with Fujisawa city (friendship city) were not realized because the related parties in both countries were not positive enough to incur the cost needed for collaboration and coalition such as opportunity costs and necessary administrative costs. ・Purchase of Japanese TV programs was not implemented because, in 2008, the time YTVS proceeded with the purchase, the relevant law was changed by the government, which made it impossible for the station to make the purchase.
YRS	・Training in Japan (editing techniques: 1 month × 1 person, equipment maintenance technique: 1 month × 3 persons, transmission techniques: 1 month × 1 person, media management: 1 month × 3 persons, production technique: 1 month × 1 person) ・Purchase of Japanese music		

Source: Documents provided by JICA and the executing agency and interviews with the YTVS and YRS

With respect to training in Japan, although medium-term courses for the duration of 1 month for engineers at YTVS and YRS were planned (810 man-days in total), in implementation, this was changed to short-term courses for 38 persons for 10 to 14 days

for the main training content of site visits (475 man-days in total). The reasons for shortening the duration and increasing the number of trainees were as follows: the duration was deemed to be sufficient for technical staff to acquire the skills required to operate the procured equipment by receiving instructions from manufactures upon delivery of the equipment; and more engineers needed to have a common understanding of the capability, extensibility, and utility of high definition (hereinafter called "HD") technology. To respond to the learning needs of YTVS and YRS, such as the concept design of program productions and learning about the products made using HD technology, the training content of training in Japan was modified accordingly. These changes are deemed to be within the appropriate range of the purpose of the project.

The purchase of Japanese TV programs was not implemented. The reason for this is that although government policy did not (apparently) prohibit purchases by local broadcasting stations at the time of the appraisal, the government changed the relevant law to prohibit such purchases at the time YTVS proceeded with the plan in 2008.

In regard to the coproduction of a TV program with a Japanese broadcasting station, with the support of the consulting agency, YTVS and NHK Enterprises, a Japanese production company, coproduced a special program "Long Town Banquet"[4] in October 2008. According to YTVS, production staff from YTVS learned from Japanese technical staff the process for producing following: (1) production along with a deliberate plan which is made in advance; (2) composition of the program from the view point of the personas (e.g., citizens, farmers); (3) developing detailed scenes (to convey the culture and values of the personas).

(3) Consulting service

Consulting services for equipment procurement were used as planned. As noted above, since the purchase of Japanese programs and music was not implemented because of a change in government policy, planned supporting service regarding the purchase was also not implemented.

(4) Effect of STEP conditionality

The project applied the conditions of STEP consisting of the following requirements: the main contractor should have ties to Japan, the share of products of Japanese origin should be more than 30% of the total contract amount. These conditions were met.

As an effect of the STEP project to procure Japanese products, YTVS has spent their own funds, even after completion of the project, to purchase Japanese studio equipment

[4] It is a traditional event among ethnic minority of Hani in Yunnan province, organizing a banquet at a very long table where people place their sheets on a line.

such as video cameras that were procured by this loan project, because of the needs of compatibility of functions and usability of the equipment. According to YTVS, Japanese products for the broadcasting sector are some of the best products. YTVS and YRS intend to expand their equipment and facilities using Japanese products.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total amount of actual project cost was 3,747 million yen, as planned (100%). The foreign currency cost of the project was 3,005 million yen, which is almost the same as the planned amount. The local currency cost of the project was 742 million yen, which is almost the same as the planned amount (99% of it).

Table 3: Project Cost, Planned and Actual Amounts (unit: million yen)

	Plan				Actual			
	FC*	LC**	Total		FC*	LC**	Total	
	(Target of loan)	(Not-targeted by loan)	Total	of which loan amount	(Target of loan)	(Not-targeted by loan)	Total	of which loan amount
Broadcasting equipment	2,669	712	3,381	2,669	2,927	742	3,669	2,927
Training in Japan (of which purchase of Japanese programs)	46 (22)	-	46 (22)	46 (22)	26	-	26	26
Price escalation***	101	1	102	101	-	-	-	-
Contingency	141	36	177	141	-	-	-	-
Consulting service	51	-	51	51	49	-	49	49
Commission					3		3	3
Total	3,008	749	3,757	3,008	3,005	742	3,747	3,005

Source: Documents provided by JICA and executing agency
Note: FC*: Foreign currency, LC**: Local currency, Price escalation***: Contingency for the rise of project costs due to inflation
Exchange rate at the appraisal: 1 yuan= 14.3 JPY. Actual exchange rates: the following IMF annual rates are applied to the corresponding annual expenses to compute the total amount in the local currency; 1 yuan = 13.1 JPY (2004), 13.5 JPY (2005), 14.6 JPY (2006), 15.5 JPY (2007), 14.9 JPY (2008), 13.7 JPY (2009), 12.4 JPY (2011)

In relation to the distribution of procurement packages, there were three packages at project appraisal, whereas there were five packages in actuality (Table 4).

Regarding package 4, the contents of the package were included in the plan. These consisted of items removed from the original packages 1, 2, and 3 in rearranging the

items so as to make the procurement easier. The modification was approved by JICA in 2006.

The reason for adding package 5 was that after completion of the procurement in the original plan (modified packages 1 to 4) in December 2010, there remained an unused amount in the budget for price escalation and the purchase of Japanese programs, which was impossible to use because of the change in government policy. Consequently, the budget was allocated to the additional package of equipment to make better use of the procured equipment. This change was approved by both governments of China and Japan; therefore, it is deemed to be valid.

Table 4: The Amount of Respective Packages

Package	Plan (million yen)	Actual (million yen)
1. Equipment and facilities for YRS	655	606
2. Equipment and facilities for YTVS	1,128	334
3. Equipment and facilities for YTVS	886	727
4. Equipment and facilities for YTVS*		1,119
5. Equipment and facilities for YTVS*		144
Total	2,669	2,930

Source: Documents provided by JICA

*Package 4 and 5 were added after project commencement

3.2.2.2 Project period[5]

Total project period was significantly longer than planned, the actual periods was 106 months which were equivalent to 183% of the planned period (Table 5).

Table 5: Project Period, Plan and Actual

	Plan	Actual
Whole project	From March 2004 (signing of the Loan Agreement) to December 2008 (58 months)	From March 2004 (signing of the Loan Agreement) to December 2012 (106 months) (183% of planned duration)
a) Procurement of equipment	From October 2004 to December 2008	From August 2004 to December 2012
b) Training	From October 2004 to December 2008	From September 2007 to May 2008
c) Consulting service	From April 2004 to December 2008	From March 2006 to December 2012

[5] The end of the project period is defined as the completion of all three components, that is, the procurement of equipment, the implementation of staff training, and the use of consulting service.

The delay was caused by the following four reasons:

(1) The conclusion of the contract among the executing agency and the consulting agency was delayed. (The understandings of "the Guidelines for the Employment of Consultants under Japanese ODA Loans" between the executing agency and the consulting firm were different, although JICA China office held a seminar to explain the guidelines for executing agency. Further, the need of coordination over the corporate tax and the contract of Japanese TV programs purchase arose between both sides.)

(2) It took some time for the executing agency and JICA to communicate on fixing the items in the packages since the executing agency dealt with STEP project for the first time.

(3) The procurement of package 1 was performed twice because there was a fault in the bidding qualifications of the first winning bidder.

(4) After completion of procurement of the planned items in December 2010, the executing agency procured the additional package to make effective use of the remaining loan amount.

3.2.3 Results of Calculations of Internal Rates of Return

The effectiveness of the project resulted in not only upgrading the broadcasting equipment and facilities but also various additional aspects such as the training in Japan, and dissemination of information for people's awareness of the environment, public health, and market rules. Therefore it is difficult to measure quantitatively (and comprehensively) the effect on the internal rate of return. The project did not compute a rate at either the project appraisal or ex-post evaluation stage.

Based on the facts above, although the project cost was within the plan, the project period significantly exceeded the plan. Therefore the efficiency of the project is fair.

3.3 Effectiveness[6] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indictors)

This ex-post evaluation validates evidence by comparing the target values two years after project completion, which was set at the appraisal, and the actual values.

In respect to the operation and effect indicators of both the population coverage rate and the number of viewers/listeners, the actual values exceeded the planned values at the time of project completion. All quantitative indicators, except the number of educational programs on YTVS, attained their targets as of two years after project completion. The

[6] Sub-rating for Effectiveness is to be put with consideration of Impact.

reason for failing to achieve that number is as follows. According to YTVS, while the government definition of an educational program at the appraisal could not be verified, it could, yet, be verified at the ex-post evaluation (for instance, programs about preparing for university entrance examinations, rebroadcasted programs, and adult education programs were not defined as educational programs). Therefore, the failure of achieving this indicator could have caused by the difference between the definitions at the two time points. Consequently the extent to which the project achieved the planned number of educational programs remains unclear.

Table 6: Operation and Effect Indicators

Indicator	Organization	Baseline 2003	Target 2010	Actual 2012	Actual 2014
		Baseline Year	2 Years After completion	Completion Year	2 Years After Completion
Population coverage rate (Yunnan province) (%)	T	91.5	93.0	96.5	98.3
Number of viewers/listeners (Yunnan province, 10 thousand households)	T	1,000	1,046	1,260	1,382

Source：Documents provided by JICA and executing agency
(T: YTVS)

Table 7: Other Quantitative Indicators

Indicator	Organization	Baseline 2003	Target 2010	Actual 2012	Actual 2014
		Baseline Year	2 Years After completion	Completion Year	2 Years After Completion
Number of independently produced programs (per week)	T	24	48	51	59
	R	82	120	139	151
Rate of independently produced programs (%)	T	9.8	50.0	38.0	56.1
	ET	-	50.0	50.5	52.1
	R	39.0	70.0	56.0	74.8
Number of channels	T	6	7	9	10
	R	6	6	10	10
Broadcasting hours(per day)	T	107	120	132	141
	R	84	110	118	127
Broadcasting hours of education programs (per day)	T	5.3	37.0	32.5	39.4
	ET	-	32.0	30.7	35.8
	R	22.0	35.0	35.3	40.2
Number of education programs (per day)	T	26	55	28	35
	ET	-	48	56	49

	R	25	40	49	49
Number of programs related to disaster prevention (per week)	T	7	14	16	19
	R	7	14	15	20
Number of programs related to environment conservation (per day)	T	5	6	8	10
	R	2	4	5	8
Number of programs related to public health (per day)	T	3	5	6	9
	R	4	6	6	8
Number of programs related to the development of market economy (per day)	T	2	3	4	7
	R	1	2	3	6
Number of programs produced in a foreign country (per day)	T	6	8	8	9
	R	1	1	2	4
Number of programs produced in Japan (per day for TV, per year for radio)	T	1	2	2	2
	R	0	0	0	0
Number of ethnic-minority-focused programs (per day)	T	1	2	3	6
	R	5	5	7	11
Number of programs targeting women (per day)	T	2	4	6	9
	R	1	2	4	8
Number of programs targeting children (per day)	T	2	4	5	7
	R	1	2	3	6

Source: Documents provided by JICA and executing agency
(T: YTVS, R: YRS, ET: Yunnan Education Television Station that was planned to be established at the appraisal. This station was not founded (see also "3.5.1 Institutional Aspects of Operation and Maintenance") in practice; therefore, the values in the table refer to the numbers from the Child Channel and the Education Channel of YTVS. The number of the programs in YTVS excludes programs from these two channels.)

3.3.2 Qualitative Effects

The digital editing system procured for the project makes it possible to produce and edit in a non-linear manner (a type of editing work using computer) without using video tapes, resulting in streamlining of production time and costs. Concretely, at the time of program production, the staff can edit the program until just before the on-air time of the news because of the digital system. Previously, using the analog system, they had to finish the editing 3.5 hours before the on-air time (it took this length of time to process the program for broadcasting), thereby, news articles that were not finished being edited by 3.5 hours before broadcasting had to be carried forward to the next day. Currently, news events that happen right before the on-air time can still be broadcasted. Regarding the streamlining of the cost, the purchase of the cassette tapes is no longer required.

Additionally, efficient use of former tape storage space is now possible (interview with YTVS).

During training in Japan, YTVS staff learned the advantages of NHK's open-plan studio, in which the mobility of staff in program production is facilitated. Thereafter, they adopted that style for the procured studio (a studio of 400 m^2). This style of studio has contributed to efficient program production. On another occasion during training in Japan, staff had the opportunity to witness a live broadcast program at an outdoor site. After returning to China, this experience was employed in setting up equipment for live broadcasts. For instance, they applied this experience to the cases of live broadcasting such as the torch relay for the Beijing Olympics, important events/festivals of ethnic minorities, reports of earthquake disasters, and so on. According to YTVS, the quality of their live broadcasts has improved.

Regarding radio programs, a method of program production including listeners' discussions (direct participation) has been adopted in YRS's news program "Golden Hot Line". This program records and broadcasts meetings in which the leaders of local government and listeners discuss local issues, which happened for the first time for a radio program in Yunnan province. According to YRS, the program has acquired a favorable reputation from many listeners.

YTVS's and YRS's history of winning awards also supports the observation of an improvement in the quality of their programs. YTVS's program "The Voice of Earth" earned the 22nd "Star Light Award" (one of the three major titles of State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China[7] for image products). The program "Red and Blue" also won the prize of Best Short Documentary Film at Sheffield International Documentary Festival, which is one of the most important film festivals in the UK. Moreover the results of market research back up the quality improvement of their programs. According to CVSC-Sofres Media, one of the most famous media research institutions in China, the audience rate of YTVS in Kunming city (the capital of Yunnan province) has risen from 18.4% in 2002 to 22.3% in 2013. The listening rate of YRS in the city has also risen, from 61.7% in 2002 to 69.6% in 2013.

Based on these facts, (1) all of the quantitative indicators (except one) achieved their targets, (2) the content and methods of production were improved by the procured equipment and facilities, and (3) the achievements of YTVS and YRS were valued by foreign and domestic organizations and were confirmed by results from a market research firm. Therefore, the effectiveness of the project is high.

[7] It is a national-level organization that supervises the sectors of the press, publication, radio, film, and television.

Open studio in Japanese style. Staff collaboration encourages efficient production.

The studio of "Golden Hot Line" in which a Japanese method (viewers and experts discuss hot topics) is employed

Column: Application of Japanese method of disaster reporting

In 2014, Yunnan province experienced two large earthquakes. A quake of magnitude 6.5 hit Ludian county in August, and another quake, with magnitude 6.6, hit Jingguw county in October, resulting in disasters in these areas. Specifically, the earthquake in Ludian killed over 600 people. YTVS made a series of reports about the disaster using the procured equipment and facilities of this project. They broadcasted the situation in the disaster area to the whole country and provided helpful information for victims in the area. For instance, information provisions on the aftershock of quakes after the each occurrence of the shock; the distribution of water, food, living necessaries, and so on; assistance for reconstruction after the disaster (waging a campaign for the promotion of specialty goods in the disaster area). These news reports for disasters did not previously exist in China. YTVS had learned them from the news programs of the Great East Japan Earthquake (hereinafter called GEJE).

In 2011, YTVS was planning to dispatch crews of reporters to Japan to report in GEJE to the public in China. They could carry this out with the cooperation of TV Asahi through the Embassy of Japan in China’s facilities. The crews learned about content and methods of reporting the disaster from Japanese broadcasting stations. After returning to China, their experience was shared in YTVS, and then, applied to the case of the earthquake reports in Ludian and Jingguw. In this case, Japanese knowledge was effectively applied to China using the equipment and facilities procured.

Since 2013, The government of China has reviewed disaster prevention including reports of the domestic disaster and conducted research on emergent reporting of disasters/disaster prevention of Japan. YTVS has formulated in 2014 "Regulation of the Emergent Report of Disaster and Disaster Prevention", which refers to related rules for Japanese broadcasting stations. This regulation consists of the system of emergent reporting in the event of a disaster at the station in addition to a clear assignment of

responsibilities in this case. YTVS has developed fast-track reactions for disaster reporting.

Report of Ludian Eathquake in 2014

The mobile unit of transmitting equipment procured by the project

3.4 Impacts

3.4.1 Intended impacts

(1) Advancement of education, cultural enrichment and knowledge enhancement for the citizens

As in Table 7 above, the numbers and durations of broadcast programs related to education, culture, and socio-cultural information have risen since the appraisal.

The beneficiary survey[8] indicates that citizens in Yunnan province watch and listen to the programs of YTVS and YRS, and appreciate their local relevance, promptness, and usefulness.

With respect to the viewership and listenership, 60% and 40% of people in Yunnan watch YTVS and listen to YRS, respectively, on a routine basis. People's most favorite programs are news and health programs. More than 80% of YTVS's viewers recognize the improvement in the quality of programs in terms of the local relevance, diversity, and usefulness compared to the quality in 5-10 years ago. In the same manner, more than 70% of YRS listeners responded that YRS's programs have improved in terms of diversity and usefulness. In an increasing trend of Internet usage and a declining trend of TV and radio usage, the advantageous features of YTVS and YRS programs have been retained and supported by their audiences.

With respect to ethnic-minority people, they [except for Miao (Hmong) people] show a trend similar to that of Han people (major ethnic group) regarding watching TV and listening to the radio, and appreciate the content of TV and radio programs. Although

[8] The beneficiary survey was conducted in December 2014 at approximately 10 sites in Kunming prefecture, Xiaoshuijing village (ethnic minority area) and Yuxi prefecture using a questionnaire. Researchers heard the answers directly from beneficiaries and recorded them on paper. The numbers of valid responses were 50 in Kunming prefecture, 20 in Xiaoshuijing village, and 30 in Yuxi prefecture (50 males and 50 females). The contents of questions mainly covered the trends of watching TV and listening to the radio, the evaluation of YTVS's and YRS's, programs, information about and interest in foreign countries (US, Korea, and Japan), through TV and radio programs.

Miao people do not listen to the radio, they still watch TV in a similar manner to that of Han and other ethnic-minority people; they also appreciate YTVS's TV programs. Like Han people, ethnic-minority people are also deemed to receive benefits from the improvement of the quality of YTVS.

During the project period, the programs in ethnic minority languages were broadcasted to elderly ethnic minority people, especially female people, who do not understand Putonghua. Because the beneficiary survey shows that the elderly appreciate programs on legislation and health in particular, it is found that information from TV offers benefits to the elderly who do not understand Putonghua.

Based on the facts in the beneficiary survey, the project has had an impact on the advancement of education, cultural enrichment, and knowledge enhancement for the citizens of Yunnan.

(2) Strengthening of collaboration between Japanese and Chinese broadcasting stations

Collaboration between Japanese and Chinese broadcasting stations as a result of the project after project completion was not observed. However YTVS reported that they have been affiliated with TV Asahi for a long period to dispatched television crews to report on GEJE for China, and to exchange materials for programs (column "Application of Japanese method of disaster reports"), although this is not a direct impact of the project.

(3) Promotion of Mutual Understanding between Japan and China

Since the purchase of Japanese TV programs has not been implemented, the impact on mutual understanding between Japan and China as a result of the purchase is difficult to observe. Additionally, evidence that shows an improvement of the impression of Japan from the beneficiary survey has not been obtained.

There was no Japanese TV program purchased and broadcasted within the scope of the project; there has been a limited number of broadcasted programs related to Japan during and after the project; thereby, the project does not have a noticeable impact on mutual understanding between Japan and China. However, YTVS reported that staff dispatched to training in Japan increased their interests in (and understanding of) Japanese technical staff work behaviors.

3.4.2 Other Impacts

There were no negative impacts on the natural environment or any resettlement of residents because of this project.

Based on the facts above, this project has largely achieved its objectives. Therefore effectiveness and impact of the project are high.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

Because of organizational changes in 2012, the Yunnan Radio, Film, TV Department was changed into the Administration of Press, Publication, Radio, Film and Television of Yunnan province (hereinafter called APPRFTY). Yunnan TV Department and Yunnan Radio Department were changed to YTVS and YRS, respectively. Yunnan Education TV Station, which was planned to be established at the time of the appraisal, was not established at the time of ex-post evaluation; instead, the Child Education Channel was established within YTVS in 2006. Because the channel is specialized for the production and broadcast of educational programs, the objective of the establishment of Yunnan Education TV Station has been achieved.

Responsibility for maintenance and management of the procured equipment and facilities was assumed by YTVS and YRS under the supervision of APPRFTY. YTVS and YRS have 1,673 staff in total (the portion of YTVS staff is 70% and that of YRS staff is 30%), including 442 technical staff who are in charge of the broadcast operation, control/transmission system management, facility management, and maintenance. According to YTVS and YRS, sufficient numbers of appropriate personnel have been assigned.

3.5.2 Technical Aspects of Operation and Maintenance

As noted above, there are 442 technical staff members who directly operate the procured equipment and facilities in this project. This group consists of 4 staff members with the certification of "Advanced Engineer", 43 staff members with the certification of "Junior Advanced Engineer", and 102 staff members with the certification of "Engineer". According to APPRFTY, they have maintained their skills in a sufficient level to operate the equipment.

In the ex-post evaluation study, it is confirmed that there are training sessions provided by the manufacturers when new equipment is procured. Additionally, there are manuals available and ready to be referred to by technical staff.

Moreover, since the launch of the project, each division or department in YTVS has conducted ad-hoc training sessions or technical meetings (approximately once every two months) to solve the problems that arise in everyday operation of equipment and facilities. They continue these same activities at the same frequency at the ex-post evaluation.

Based on the facts above, no problems in terms of the technical aspects of operating and managing the procured equipment and facilities are found.

3.5.3 Financial Aspects of Operation and Maintenance

Considering the financial statuses and steadily increasing advertising sales volume since 2002 in YTVS and YRS, both organizations have maintained steady financials. For this reason, the two organizations are deemed to be able to afford to allocate sufficient budgets for operation and maintenance work (Table 10 and Table 11).

Table 10: Financial Status of YTVS

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	169	731	850	1,126	1,203	1,020
Sales: advertisement	104	583	588	745	899	845
Sales: Others	10	85	209	307	177	71
Subsidy	55	63	53	74	127	104
Other income	0	0	0	0	0	0
Total annual expenditure	108	661	809	1,068	1,127	1,014
Employment cost	17	62	123	138	150	153
Program production, purchase	36	171	229	407	413	421
Administration expense	42	338	331	406	425	250
(of which maintenance cost)	(1)	(3)	(4)	(5)	(8)	(3)
Investment for fixed asset	4	48	41	60	34	80
Money paid to government	6	35	41	15	56	28
Other costs	3	7	44	42	49	82

Source: Documents provided by the executing agency

Table 11: Financial Status of YRS

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	37	76	96	102	99	122
Sales: advertisement	26	42	57	61	69	93
Sales: Others	1	3	2	1	2	1
Subsidy	10	29	35	39	22	28
Other income	0	2	2	1	6	0
Total annual expenditure	36	57	71	97	91	111
Employment cost	17	24	29	34	42	52
Program production, purchase	2	6	6	9	12	9
Administration expense	3	13	16	15	16	12
(of which maintenance cost)	(1)	(3)	(4)	(5)	(8)	(3)
Investment for fixed asset	2	2	4	19	1	5
Money paid to government	1	2	3	4	4	6
Other costs	11	10	13	16	16	27

Source: Documents provided by the executing agency

3.5.4 Current Status of Operation and Maintenance

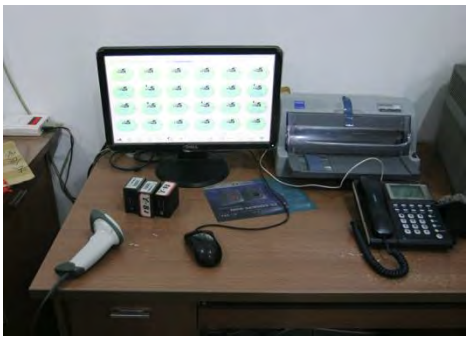
In YTVS and YRS, the equipment and facilities, including those procured by the project, are properly operated and managed according to the personnel plan and the regulations for maintenance. Systems for better management of the equipment, such as bar-code management system, have been designed and installed.

Some devises such as mixers were over their usable lives because of a high frequency of usage, and alternative devices have been installed. Appropriate measures for providing substitutions have been taken by the two organizations.

For these reasons, the two organizations are not deemed to have problems in terms of operation and maintenance of equipment.

Based on the facts above, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effects is high.

Stored digital cameras procured by the project



A bar-code reader system for management of usage of equipment

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to improve television and radio broadcast programs in Yunnan province, in terms of both quantity and quality, by replacing equipment at both Yunnan TV Station (hereinafter called YTVS) and Yunnan Radio Station (hereinafter called YRS) as well as implementing the training in Japan, thereby contributing to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens of Yunnan province, and the promotion of mutual understanding between Japan and China. This project is closely related to China's development plans, development needs, and Japan's ODA policy; therefore, its relevance is high. Additionally, the project cost was within the plan; however, the project period significantly exceeded the plan. Therefore its efficiency is fair. Both the population coverage rate and the viewership set as the project

target criteria steadily increased, which evidences the project effectiveness. The efficiency of the program production is improved through the use of the procured digital equipment. The effectiveness of the training in Japan, such as the introduction of the Japanese open-plan studio, and the discussion style among citizens or intellectuals on radio programs has been observed; the improvement of the quality of broadcasting services (both in hardware and software) has contributed to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens, especially for ethnic minority people of Yunnan; therefore, the effectiveness and impact are high. Regarding the sustainability of the project, the status of the organizational, technical, and financial aspects have been stable and sufficient. In this way, the sustainability of the effectiveness of the project is high.

Based on the above facts, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendation to JICA

None.

4.3 Lessons learned

(1) Application of Japanese knowledge of emergent disaster reporting and disaster prevention to projects in the disaster prevention sector

As described in the column "Application of Japanese method of disaster reports", YTVS provided the victims of the disaster with necessary information for disaster prevention and reconstruction after the earthquakes in Ludian and Jingguw in 2014. The methods and contents of that information were learned from a Japanese broadcasting station after GEJE. The knowledge accumulated by the Japanese broadcasting station in that sector can be shared with large numbers of countries in which people suffer from natural disasters. For the formulation of new projects based on yen loans or technical cooperation in the disaster prevention sector, it is worth considering incorporating the methods and content of disaster prevention report, which are strong points of Japanese knowledge, into the component of these projects.

(2) The need for risk and implementation process analysis of the soft components with high-difficulty

The project did not implement the purchase of Japanese programs. The cause was a change in the related law in China. However if this direct cause had not occurred, the

implementation of the purchase should have yet been very difficult, according to the facts collected in the ex-post evaluation. For instance, there yet remained a number of issues such as research and selection of the program that could gain the acceptance of the Chinese audience, the process to clear the copyrights domestically and in Japan, the coordination with the central government and provincial broadcasting agencies on the maximum number of foreign TV programs that were allowed to be broadcasted in the whole country, the program scheduling in YTVS upon clearance of all of the conditions above, and so forth, to be solved before purchase; in essence, the component of purchasing Japanese programs was the one with high-difficulty to be achieved. At the time of the ex-post evaluation purchase has been allowed due to the change of the operation of related legal systems, YTVS yet does not purchase and broadcast any Japanese program because selecting Japanese programs that can lead to the audience rate increase is so difficult (interview with YTVS).

In these difficult cases, one needs careful investigation at the appraisal with respect to the types and levels of risk that may restrict the implementation of the project components. While the appraisal documents had confirmed the past actual achievements of purchase of foreign TV programs as well as Japanese ones, it did not recognize the possibility of restrictions on the purchase or import of foreign TV programs as well as above difficulties to be solved, as an explicit risk. It was after the beginning of the project that a survey on relevant policies and rules was conducted.

Because the objective of the promotion of mutual understanding between the two countries based on Japanese programs sounded relevant to reinforce the meaning and effect of the bilateral cooperation project, the information analysis as well as the confirmation of a possible implementation process like the above study, and the subsequent information sharing between the two countries on a feasible objective for the purchase would have been essential at the appraisal.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs Hard components	<YTVS> ・Studio equipment (digital video cameras/recorders, digital editing machines, monitors, etc.) ・Mobile unit car (3 packages in total) <YRS> ・Studio equipment (digital audio recorders/editing machines, audio work stations, transmitting devices, etc.) ・Engineering/maintenance car (4 packages in total)	<YTVS> ・As planned <YRS> ・As planned
Soft components	<YTVS> ・Training in Japan (Camera technique: 1 month × 5 persons, equipment maintenance technique: 1 month×4 persons, media management: 1 month × 4 persons, newest technology: 1 month × 5 persons) ・Coalition with Fujisawa city (friendship city) ・Collaboration such as the coproduction of a TV program with Japanese broadcasting station (with Chukyo TV, Chiba TV, and TV Nagasaki) ・Purchase of TV content such as Japanese programs and broadcast rights <YRS> ・Training in Japan (editing technique: 1 month × 1 person, equipment maintenance technique: 1 month × 3 persons, transmitting technique: 1 month × 1 person, media management: 1 month × 3 persons, production technique: 1 month × 1 person) ・Purchase of Japanese music	<YTVS and YRS> ・5 batches of the training courses in Japan for a total of 38 experts in divisions such as broadcast management, editing, and broadcasting techniques, industrial development for the duration of 10 to 14 days. Consequently, training for 475 man-days in total was conducted. ・Regarding the coproduction of a TV program with a Japanese TV station, it was replaced by a coproduction with a Japanese production company. Purchase of Japanese TV programs, broadcast rights, and Japanese music were not implemented.
Consulting service	(a) Assistance in procurement (1) Technical support for preparation of detailed design (D/D) and pre-qualification (P/Q) documents (2) Technical support for	(a) Assistance in procurement ・As planned

	evaluation of P/Q results (3) Technical support for preparation of tender documents (4) Technical support for evaluation of tender results (b) Assistance in training (1) Training in Japan (2) Co-production of programs with Japanese broadcasting stations (3) Purchase of Japanese programs and broadcasting rights	(b) Assistance in training (1) Training in Japan (2) Co-production of programs with Japanese broadcasting stations (3) Purchase of Japanese programs and broadcasting rights
2. Project period	March 2004 – December 2008 (58 months)	March 2004 – December 2012 (106 months)
3. Project cost Amount paid in Foreign Currency	3,008 million JPY	3,005 million JPY
Amount paid in Local Currency	749 million JPY (52 million yuan)	742 million JPY (52 million yuan)
Total	3,757 million JPY	3,747 million JPY
Japanese ODA Loan portion	3,008 million JPY	3,005 million JPY
Exchange rate	1 yuan ＝14.3 JPY （As of September 2003）	1 yuan ＝13.1 JPY (2004), 13.5 JPY (2005), 14.6 JPY (2006), 15.5 JPY (2007), 14.9 JPY (2008), 13.7 JPY (2009), 12.4 JPY(2011)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Broadcasting Infrastructure Improvement Project (Anhui province)"

External Evaluator: Atsushi Tsukui, International Development Center of Japan Inc.

0. Summary

The objective of this project was to improve television and radio broadcasting programs in Anhui province with respect to both quantity and quality through renovation of equipment of the Anhui Radio and Television Transmitting Center[1] (hereinafter called ARTTC), Anhui Radio Station[2] (hereinafter called ARS), Broadcasting Monitoring Station[3] (hereinafter called BMS), and General Transmitting Station[4] (hereinafter called GTS) as well as implementing the training in Japan, thereby contributing to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Anhui, and also to the promotion of mutual understanding between China and Japan. This project was highly relevant for China's development plans, development needs, and Japan's ODA policy; therefore, its relevance is high. Whereas the project cost was within the plan, the project period exceeded the plan; therefore, its efficiency is fair. Both the population coverage rate and the viewership that were set as the project target criteria have been steadily increasing, making the project more effective. The efficiency of program production has improved, and the incidence of unforeseen accidents during the broadcasting operation decreased owing to the renovation of equipment and facilities in all the four organizations. With respect to broadcasting content, the extension of the equipment and facilities such as channel addition as well as the employment of the outside broadcast van has allowed the broadcasting station to produce audience-friendly programs, resulting in the improvement of program quality. The improvement of these programs both with respect to quantity and quality has contributed to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens in Anhui to a certain extent; therefore, the effectiveness and impact of the project are high. Regarding the operation and maintenance of broadcasting services, no major systemic, technical, and financial problems have been observed; sustainability of the effectiveness of the project is thus high.

In light of the above, this project is evaluated to be highly satisfactory.

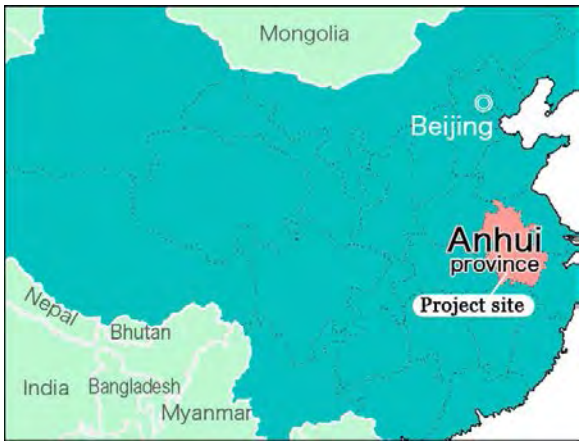
[1] It is a state-owned enterprise in which the central government owns 100% of the stocks. The enterprise has delivered cable television programs since 2001.

[2] Owing to an organizational change in 2011, Anhui Radio Department was renamed as Anhui Radio Station. Its responsibilities and services in the province were not changed (see also "3.5 Sustainability").

[3] The organization is supervised by the Administration of Press, Publication, Radio, Film and Television of Anhui province (APPRFTA) to monitor radio-wave broadcasting in the area.

[4] The organization is supervised by APPRFTA to manage radio transmission at the transmitting towers, which are located in the corresponding geographic areas to cover the entire population in the province.

1. Project Description



Project Location

Anhui Radio Station

1.1 Background

The broadcasting stations in China operate at (1) the central, (2) provincial/municipal/autonomous regional, (3) prefectural, and (4) county levels and are supervised by the corresponding governments. In 2001, the population coverage in the entire country was 94% for television, which meant that broadcasting services had achieved a certain influence on information provision, cultural enrichment, and enhancement of educational opportunities for the citizens. In view of these achievements, and to stimulate further socioeconomic development, the government set a target of 97% population coverage for television by 2010 to enhance information delivery and cultural enrichment for the people.

Anhui province, the target area of the project, with a population of 63250,000 people in 2001, is one of the most important provinces for agricultural production. Blessed with natural advantages such as scenic lands and rivers, Anhui province had developed the tourism industries, whereas industrial development lagged in its rural areas owing to natural disasters such as droughts and floods. In 2001, 20 counties were designated as “poor counties” according to government criteria. Because the poverty was mainly caused by unsatisfactory provision of information and education, the provincial government formulated a policy of developing broadcasting programs in order to disseminate cultural and educational information as well as disaster forecasting/prevention information and the technology. However, ARTTC as well as ARS, the organizations responsible for the broadcasting services, have been suffering from a lack of finance; moreover, difficulties were encountered in the production of programs such as the programs for distance education owing to the poor quality of broadcasting equipment in terms of specifications compared with the quality of the equipment in the coastal area (documents provided by JICA).

In view of this background, the project aimed at improving broadcasting programs in Anhui both in quantity and quality in order to improve the access of the citizens to the broadcasting programs, and also to contribute to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens. The project also was expected to deepen mutual understanding between Japan and China. Further, the project planned to introduce Japanese broadcasting technology and equipment to China through the Special Terms for Economic Partnership (STEP).[5]

1.2 Project Outline

The objective of this project is to improve the quantity and quality of the television and radio programs in Anhui by upgrading broadcasting equipment and providing training to the staff of the broadcasting stations, thereby contributing to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens in Anhui and also to the promotion of mutual understanding between Japan and China.

<ODA Loan Project>

Loan Approved Amount/ Disbursed Amount	3,301 million yen/ 3,250 million yen	
Exchange of Notes Date/Loan Agreement Exchange Date	March 2004/March 2004	
Terms and Conditions	Interest rate: Repayment period (grace period) Condition for procurement:	0.75% p.a 40 years (12 years) Tied (Special Terms for Economic Partnership (STEP))
Borrower/Executing Agency	Guarantor: Government of the People's Republic of China/People's Government of Anhui province	
Final Disbursement Date	August 2012	
Main Contractor (over 1 billion yen)	—	
Main Consultant (over 100 million yen)	—	
Feasibility Studies: F/S, etc.	F/S by Anhui Engineering Consulting Institute (July 2003)	
Related Projects	—	

[5] Six projects, including this project, were adopted at the same time as the projects in the broadcasting sector in China. The other five projects were those in Jinan city in Shandong province; Qinghai, Yunnan, and Jilin provinces; and the Ningxia Hui Autonomous Region.

2. Outline of the Evaluation Study

2.1 External Evaluator

Atsushi Tsukui (International Development Center of Japan Inc.)

2.2 Duration of the Evaluation Study

The evaluation study was conducted in accordance with the following schedule.

Duration of the study: August, 2014 – January, 2016

Duration of the field study: December 6 – December 14, 2014; March 4 – March 9, 2015

3. Results of the Evaluation (Overall Rating: A[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance to the Development Plan of China

The government of China has placed emphasis on the broadcasting sector to enrich people's cultural life and formulation of policies to enhance the population coverage rates of TV and radio, improve the quality of broadcasting programs, and upgrade the information technology infrastructure, including the broadcasting sector. These policies have been consistently applied from the Tenth Five-Year Plan of China (2001–2005) at the appraisal stage to the Twelfth Five-Year Plan of China (2011–2015) at the ex-post evaluation stage. The Twelfth Five-Year Plan of China emphasizes the policy of "Village to Village," which aims to provide public services, including broadcasting services, to all the rural area. From 2010 onward, the government has pushed ahead with a policy called "Fusion of the Three Nets" that integrates the existing mass media such as broadcasting into the Internet. Having set a precedent for this policy, Anhui province has upgraded the communication infrastructure, which enables people to communicate in an interactive way through media such as radio, TV, and Internet through the project (through the cable network integrating the three media). The government has subsidized Anhui's advanced trial since 2009, which shows that the project has been highly appreciated by the central government.

From the foregoing facts, it is clear that consistency between the development policies of the national and provincial governments and the project has been maintained at both the appraisal and the ex-post evaluation stages.

3.1.2 Relevance to the Development Needs of China

The per-capita GDP of Anhui province in 2013 was 31,684 yuan, which is much below the

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[7] ③: High, ② Fair, ① Low

national per-capita GDP of 41,908 yuan. Although economic development is successfully under way in the province, the number of poor counties was still 19 in 2013, and has not significantly decreased compared to the value of 20 at the project appraisal stage in 2003 (the Government of China "Anhui Province People Economic and Social Development Bulletin"). The Twelfth Five-Year Plan of Anhui province (2011–2015) set out policies such as the optimization of the income distribution structure in the area, income generation for the low-income group, and expansion of the middle-income group. To implement these policies, the government addressed the improvement in the infrastructure and the service system for information provision such as broadcasting that covers both urban and rural areas, so that all the people in the area benefit equally from the regional development.

After implementation of the project, though the ratio of digitization of broadcasting facilities of ARS has been increased, the need to enhance the capacity of media signal transformation devices has arisen because of this digitization at the ex-post evaluation. In the cable network of ARTTC, the population coverage rate in the urban areas reached almost 100% at the time of ex-post evaluation, whereas the coverage in rural areas was still approximately 60%. In order to correct the disparity of access to information between the urban and rural areas, a more extensive cable network needs to be laid that delivers TV, radio, and Internet to the most remote villages.

3.1.3 Relevance to Japan's ODA policy

"Economic Cooperation Program for China" (October 2001) of the government of Japan at the project appraisal stage formulated policies such as the promotion of market-oriented economic reform, environmental arrangements for the extension of economic relationships in the private sector, and the promotion of mutual understanding between people in both countries. "Medium-Term Strategy for Overseas Economic Cooperation Operations" emphasized human resource development and the reduction in income disparity by bridging the information gap. The project also aimed at reducing the information gap, promoting human resource development, and increasing mutual understanding in the broadcasting sector between the two countries.

From these facts, it is clear that this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy at both the appraisal and the ex-post evaluation stages. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

There are two project outputs in ARTTC, ARS, BMS, and GTS: (1) upgrading "hard" components (improvement of devices and infrastructure for broadcasting); and (2) strengthening "soft" components (training for the staff). The comparison between the planned and actual output is as follows.

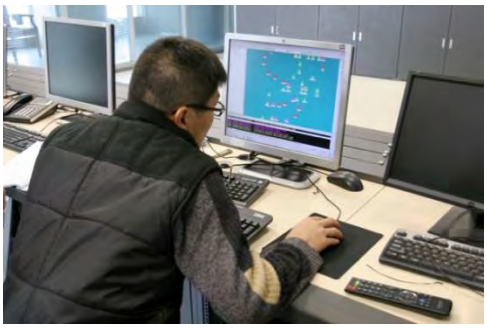
(1) Upgrading "hard" components (improvement of devices and infrastructure for broadcasting)

The upgradation took two years from the appraisal stage to procurement of the first package, during which period technological advances were made in the equipment. Consequently, the equipment procurement process was modified as shown in Table 1. The specifications of the corresponding equipment were changed so as to meet the total amount of the ODA loan. No change was necessary in terms of the function as well as the end use of the equipment.

Table 1: Plan and Actual Project Outputs ("Hard" Components)

Organization	Plan	Modification	Cause of modification
ARTTC	・Cables (fiber cables, coaxial cables, transmitters, etc.) (Package 2, 3, 5, a part of 8, 9, 10, and11)	・Though products were modified in terms of their specifications, their functions were not changed	・Time taken from appraisal to procurement stages of the first package resulted in modification of product specifications given by manufacturers
ARS	・Studio equipment (lighting, digital cassette/CD recorders, editing facilities, etc.) (Package 1, a part of Package 8)		
BMS	・Monitoring equipment (broadcasting monitor, video analyzers, receivers, etc.) (Package 6, a part of Packages 4 and 8)		
GTS	・Transmitting equipment (televisors, signal monitoring systems, adjusters, audio-video switchers, audio-video dischargers, microwave transmitters, microwave receivers, etc.) (Package 7)		

Source: Documents provided by JICA and executing agency and interview with executing agency.



Radio wave monitoring in BMS

Recording devices of ARS

(2) “Soft” components (the training in Japan)

With respect to staff training, while the original plan was to draw up midterm courses for technical personnel for 2–3 months (27 man-months in all), the plan was changed to short-term training for 40 personnel, including the staff of Administration of Press, Publication, Radio, Film and Television of Anhui province (hereinafter, APPRFTA), and BMS for 12 days (16 man-months in all) during the actual implementation (Table 2). The reasons for the change were as follows: to minimize the duration of absence of these personnel from their organizations; to apply knowledge of Japan effectively in the workplace by dispatching more personnel from each organization; and to take into account the fact that organizations were of the opinion that the skill training for personnel in the operation of the procured equipment could be sufficiently imparted by the manufacturers. This change was deemed to be acceptable for the enhancement of project effectiveness.

Purchase of Japanese music was not implemented. The reason was that in 2008, when ARS initiated the purchase, the relevant policy and law were changed by the government, which made it impossible for ARS to purchase it.

Table 2: Plan and Actual Project Outputs (“Soft” Components)

Organization	Plan	Modification	Cause of modification
ARTTC	・Training in Japan (cable TV engineering and management: 2 months × 3 persons)	・Training on cable TV engineering and management, visits to broadcast stations:10 persons × 12 days	・The number of trainees was increased because it was judged to be effective to dispatch multiple personnel from one organization so that they could apply their knowledge of Japan to their workplace. The duration of training was shortened because it was judged that
ARS	・Training in Japan (equipment maintenance and engineering: 3 months × 2 persons, recording	・Training on equipment maintenance and engineering, recording techniques and device maintenance, network	

	techniques and device maintenance: 3 months × 1 person, network engineering and management: 3 months × 1 person) ・Purchase of Japanese music	engineering and management, training on program planning, visits to broadcast stations: 10 persons × 12 days	the skill to operate the procured equipment could be properly acquired from manufacturers at the time of equipment delivery, and the focus of the training was shifted from technical training to site visits ・In addition to the planned personnel of three organizations in the appraisal, staff from BMS and APPRFTA also participated in the training because the needs of the broadcast management arose during the implementation of the project ・Purchase of Japanese music was not implemented because in 2008, when ARS initiated the purchase, the relevant law was changed by the government, which made it impossible for ARS to purchase it
GTS	・Training in Japan (TV transmitting engineering: 3 months × 1 person, TV broadcasting transmitting engineering: 3 months × 1 person, TV broadcasting management: 3 months × 1 person)	・Training on transmitting engineering, visits to transmitting stations: 10 persons × 12 days	
BMS/ APPRFTA	・Not planned	・Training on management of broadcast organization, visits to broadcast stations: 10 persons × 12 days	

Source: Documents provided by JICA and executing agency and interview with executing agency.

（3）Consulting service

Consulting services for equipment procurement were conducted as planned.

（4）Effect of STEP conditionality

The project was implemented under the conditions laid down by STEP, which included the following: the main contractor should be Bilateral-tied, and the share of products of Japanese origin should be more than 30% of the total contract amount. These conditions have been observed.

With respect to the purchase of products of Japanese origin according to the STEP conditions, the executing agency recognizes the excellence of and necessity for products of Japanese origin. In particular, ARS appreciated Japanese microphone equipment, also ARS and GTS highly appreciate the value of Japanese measuring equipment and microwave devices, and indicated an interest in the subsequent purchase and use of these products. The

executing agency was satisfied with the performance of the procured equipment and facilities. The executing agency pointed out that the condition of Japan tied constrains the number of bidders and affects the adequateness of the competitive bidding. In fact, as mentioned in "3.2.2.1 Project Cost," no evidence for a price hike caused by the foregoing condition was found.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost was 5,222 million yen, lower than the planned (98% of it). The foreign currency component of the project cost was 3,250 million yen, almost the same as the planned amount (98% of it). The local currency component of the project cost was 1,972 million yen, almost the same as the planned amount (97% of it).

Table 3: Project Cost—Planned and Actual (unit: million yen)

	Plan				Actual			
	FC*	LC**	Total		FC*	LC**	Total	
	(Target of loan)	(Not-targeted by loan)	Total	of which loan amount	(Target of loan)	(Not-targeted by loan)	Total	of which loan amount
Broadcasting equipment	3,063	1,932	4,995	3,063	3,186	1,972	5,158	3,186
Training in Japan	7	—	7	7	24	—	24	24
Price escalation***	17	—	17	17	—	—	—	—
Contingency	154	97	251	154	—	—	—	—
Consulting service	60	—	60	60	40	—	40	40
Total	3,301	2,029	5,330	3,301	3,250	1,972	5,222	3,250

Source: Documents provided by JICA and executing agency.
Note: FC*: foreign currency; LC**: local currency; Price escalation***: contingency for the rise of project cost due to inflation
Exchange rate: 1 yuan = 14.3 yen at appraisal. 1 yuan＝13.9 yen at ex-post evaluation (based on the average of IMF rates from 2007 to 2011 during which the project procured hard components)

In relation to the distribution of procurement packages, there were 7 packages at the appraisal stage, whereas there were 11 packages during implementation (Table 4).

Package 8 was added by picking some items and combining them into package 8 so that the project could commence earlier the procurement of the first package. All the equipment and facilities planned at the appraisal stage were included in packages 1 to 8, and the functions of these items were not changed from the plan. The total actual cost of packages 1

to 8 was 2,349 million yen, much less than that amount of 3,063 million yen estimated at the appraisal stage. The reasons for the low cost were as follows: 1) specifications and prices of the planned equipment and facilities changed owing to the time lag of 2 years between the appraisal and the modification of items for procurement, and 2) the actual bidding amount of all packages from 1 to 8 was much lower than planned.

Packages 9, 10, and 11, which consisted of transmission facilities for ARTTC, were added after completion of equipment procurement of packages 1 to 8 so as to extend the cable network of the plan. ARTTC originally planned to extend the network after completion of the project, and therefore these additional packages are regarded as a sound use of the loan surplus.

Table 4: Value of Respective Packages

(unit: million yen)

Package	Plan	Actual
1. Broadcasting equipment	172	285
2. Network equipment	525	636
3. Network equipment	294	213
4. Microwave transmitting/ receiving devices and vehicle	864	541
5. Network equipment	829	185
6. Monitoring devices	32	46
7. Transmitting equipment	347	224
8. Optical cables/cables*		219
Subtotal	3,063	2,349
9. Network equipment**		382
10. Network equipment**		253
11. Network equipment**		202
Total	3,063	3,186

Source: Documents provided by JICA and executing agency.
*Package 9, 10, and 11 were added after project commencement
**Package 8 was added by choosing some devices for packages 1, 3, and 6 then combining these packages into one package

3.2.2.2 Project Period[8]

The total project period was longer than the planned period by 119% (Table 5). The delay was due to three reasons: 1) the executing agency was not familiar with the procedure of STEP loan projects because it was their first implementation of such a project, and so it took two years to gain double approvals from the domestic and foreign governments for the selection and employment of the Japanese consulting agency; 2) the national policy related

[8] The end of the project period is defined as the completion of all the three components, that is, the procurement of equipment, the implementation of the training in Japan, and the consulting service.

to tax refunds was changed after the completion of the first bidding, because of which the procedure had to be repeated to gain the double approvals again; and 3) during the delays noted in 1) and 2), the specifications of the products to be purchased changed owing to technological advances, because of which the equipment list had to be changed.

Table 5: Project Period—Planned and Actual

	Planned	Actual
Whole project	From March 2004 (signing of the loan agreement) to December 2009 (70 months)	From March 2004 (signing of the loan agreement) to January 2011 (83 months) (119% of planned duration)
a) Procurement of equipment	From October 2004 to September 2007	From July 2007 to January 2011
b) Training in Japan	From October 2004 to December 2009	From November 2009 to December 2009
c) Consulting service	From April 2004 to December 2009	From November 2006 to December 2009

Source: Documents provided by JICA and executing agency.

3.2.3 Results of Calculations of Internal Rates of Return

The effectiveness of the project was due to not only upgrading broadcasting equipment and facilities but also to various aspects such as training in Japan, dissemination of information for public awareness on the environment, public health, and market rules. Therefore, it is difficult to measure the effect quantitatively and comprehensively with the internal rate of return. The project did not compute the rate either at the project appraisal or ex-post evaluation stages.

From the aforementioned facts, it is clear that although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.3 Effectiveness[9] (Rating:③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

This ex-post evaluation of the project validates evidence by comparing the planned and actual values a year after the project's completion. Because all the planned hard and soft components were completed in 2009, this ex-post evaluation study regarded 2009 as the project completion year and therefore 2010 as the year one year after the project's completion.

[9] Sub-rating for Effectiveness is to be put with consideration of Impact.

In respect to the Operation and Effect Indicators of both the population coverage rate and the number of viewers/listeners, these actual values were exceeded at the time of the project's completion. Most of the other quantitative indicators used as reference indicators also attained the target one year after the project's completion.

The number of ARTTC users increased from 840,000 households in 2003 to 3,210,000 households in 2013, a 3.8-fold increase in that period (interview with ARTTC). With respect to the radio and TV interactive communication service[10], which was made possible by the procured equipment, the number of users of this service increased from 60,000 households (2009, the year of inauguration of the service) to 200,000 households (2013), a 3.3-fold increase in that period (documents provided by ARTTC).

Table 6: Operation and Effect Indicators

Indicators	Baseline	Target	Actual	Actual	Actual
	2003	2010	2009	2010	2013
	Baseline	1 Year After completion	Completion Year	1 Year After completion	Latest
Population coverage rate (Anhui province) (%)	95.0	95.0	98	98	98
Number of viewers/listeners (Anhui province) (10,000 households)	5,985	6,111	6,200	6,205	6,286

Source: Documents provided by JICA and executing agency.

Table 7: Other Quantitative Indicators

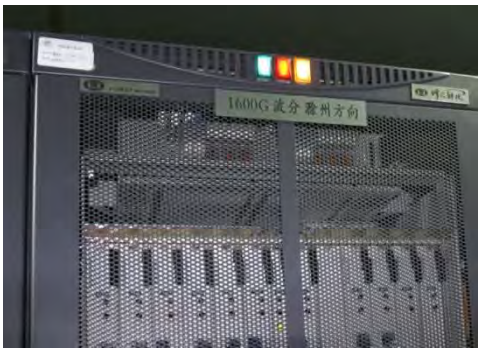
Indicators	Organization	Baseline	Target	Actual	Actual	Actual
		2003	2010	2009	2010	2013
		Baseline	1 Year after completion	Year of completion	1 Year after completion	Latest
Number of independently produced programs (per week)	R	123	168	169	176	182
Rate of independently produced programs (%)	R	83.7	96	96	96	96
Number of channels	R	4	7	9	9	9
Broadcasting hours (per day)	R	79.5	152.5	198	214.5	219
Broadcasting hours of education programs (per day)	R	1	6	7	10	15
Number of education programs	R	2	8	8	10	12
Number of programs related to disaster prevention (per	R	10	12	13	15	18

[10] Users subscribing to the interactive service can choose any program by themselves (on-demand TV) and thus receive local information such as news and weather forecast, which are provided by ARTTC.

month)						
Number of programs related to environment conservation (per day)	R	3	6	7	11	19
Number of programs related to public health (per day)	R	3	6	5	11	20
Number of programs related to the development of market economy (per week)	R	3	6	5	10	19
Number of programs targeting women (per week)	R	20	26	22	28	31
Number of programs targeting children (per week)	R	14	20	17	23	28

Source: Documents provided by JICA and executing agency.
(R: ARS)

Screen of cable TV and radio of ARTTC



Equipment of cable network in ARTTC

3.3.2 Qualitative Effects

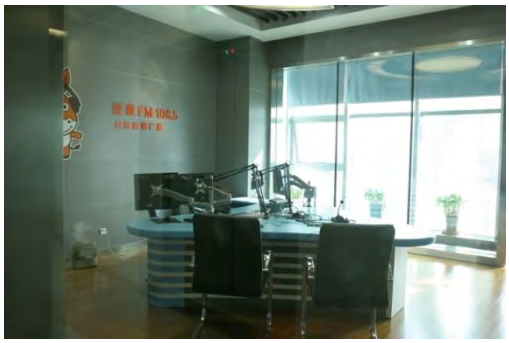
According to APPRFTA, the procured equipment has improved the quality and efficiency of program production; decreased broadcasting accidents; and made it possible to more easily produce listener-friendly programs, thereby stimulating innovation in program content.

Regarding the effectiveness of the training in Japan, the cases such as the application of the material archive system in NHK (Japan Broadcasting Association) , and the purchase of Japanese material (optical fiber cable) that was introduced in the training in Japan, within the scope of the project were reported. A synergy effect of hard components and soft components is deemed to appear.

The beneficiary survey[11] illustrates that although the number of listeners of ARS has been

[11] The beneficiary survey was conducted in January 2015 at approximately 10 sites in Hefei and Bozhou prefectures by using a questionnaire. Researchers heard the answers from beneficiaries, filled them in the sheets, and then collected them. The numbers of valid responses were 50 in Hefei prefecture, 30 in Bozhou prefecture, and 20 in Guoyang county (50 males and 50 females). The questions mainly covered the trends in TV and radio use, the evaluation of ARS, and knowledge of and interest in foreign countries(US, Korea, and Japan), through TV and radio programs.

declining, nearly one half of the total inhabitants acknowledge ARS's broadcasting programs to be one of their main information sources. These listeners appreciate the local interest and the promptness of information that ARS delivers. Further, the listeners appreciate the current usefulness of ARS's programs in terms of factors such as local interest and promptness compared to the programs of 5 to10 years ago. For instance, 41% of listeners who responded that ARS's program was useful appreciated the utility of ARS's channel of transportation information. The channel was a pioneer in delivering live broadcasting of traffic information in the whole country, and consequently ARS received a prize in the category of "National level advanced organization in radio movie and TV sector" owning to the performance of that channel. It is an annual prize awarded by the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China.[12] Other than this channel, the programs that the listener appreciated were news programs such as "Early Morning News" and "News from Direct Source." This demonstrates that the prompt provision of news based on local interest is useful for citizens. The results of the beneficiary survey indicate that the good features of ARS's program are highly appreciated by listeners.



Recording studio in ARS

Transmitting tower of GTS

3.4 Impacts

3.4.1 Intended Impacts

(1) Advancement of education, cultural enrichment, and knowledge enhancement for citizens

As described in Section 3.3, the number and duration of broadcasting programs related to education, culture, and sociocultural information have risen since the appraisal.

By adding more channels, ARS has delivered more programs to broader groups of listeners, and has tried to ascertain and incorporate listeners' opinions on their programs by holding events for listeners. The evidence shows that ARS has retained the activities that improve the quality of broadcasting programs that advance education and enhance the knowledge of

[12] The national-level organization that supervise sectors of press, publication, radio, film, and television.

people. As noted in Section 3.3.2, the beneficiary survey shows that people gain the most benefits from transportation and news programs. Therefore, the project has made a certain impact on the advancement of education, cultural enrichment, and knowledge enhancement for the citizens.

(2) Promotion of Anhui citizens' understanding of Japan

While the beneficiary survey shows that 71% of citizens in Anhui have had the same or more opportunities to get information related to Japan, there is no reliable evidence in the analysis to show an improvement in people's impressions of Japan compared to other countries.

3.4.2 Other Impacts

There were no negative impacts on the natural environment and resettlement of residents due to this project.

Based on the aforementioned facts, this project has largely achieved its objectives. Therefore, the effectiveness and impact of the project are high.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

Owing to the organizational change in 2010, Anhui Radio, Film, TV Department was reorganized as APPRFTA. Although this organization used to supervise Anhui TV, Anhui Radio, and GTS at the appraisal stage, these three organizations currently have the same rank in the administration level. BMS still operates under the supervision of APPRFTA. ARTTC, the state-owned enterprise in which the national government holds 100% of the stocks, has operated cable TV services on a self-paying basis, and retained its organizational arrangement since the commencement of the project.

The technical personnel for the operation and maintenance work shown in Table 8 are engaged in sustainable operation of the facilities procured by the project. According to the executing agency, the right personnel for operating and maintaining procured equipment have been largely secured.

Table 8: Organizational Arrangement for Operation and Maintenance

ARTTC	The total numbers of staff, including both in the headquarters and subsidiaries, is 3,500. There are approximately 1,000 technical personnel in charge of operation and maintenance of equipment
ARS	The total number of staff is 500. There are 70 to 80 technical personnel in charge of operation and maintenance of equipment
BMS	Most staff in BMS are technical personnel. There are 17 technical staff
GTS	There are 28 transmitting towers in Anhui, and there are approximately 500 staff. Most of the staff are in charge of operation of transmitting services. The number of staff who directly work in the General Transmitting Station that is located in the center of Anhui province is 42, including 6 technical personnel

Source: Interview with executing agency.

3.5.2 Technical Aspects of Operation and Maintenance

In ARTTC, ARS, BMS, and GTS, various regulations and detailed rules have been developed by the central government to secure a 24-hour broadcasting operation. Technical aspects of the operation and maintenance of equipment are shown in Table 9. The ex-post evaluation study did not observe any lacunae in the technical aspects.

Table 9: Technical Aspects of Operation and Maintenance of Equipment

ARTTC	ARTTC's technical personnel take full responsibility for operation and maintenance of procured equipment and facilities. Divisions in charge of technical matters have operational rules. ARTTC outsources maintenance of the facilities installed in their branches in prefectures and counties
ARS	ARS conducts a quarterly training session to upgrade technical personnel's skill. Further, the training session for the newly installed equipment is delivered by the manufacturer upon its installation. ARS has developed "The Manual of Equipment Procured by Japan Loan," which compiles information on installation of equipment and its use. ARS distributes a soft copy of this manual to the corresponding divisions, and these divisions adhere to the manual
BMS	The manufacturers of the equipment and facilities take the responsibility of maintaining them. BMS operates the equipment and facilities according to national regulations. Training sessions for technical personnel are regularly conducted
GTS	There is a set of national regulations for the operation and maintenance of the transmitting equipment. GTS has also developed detailed rules in addition to the national regulations

Source: Interview with executing agency.

3.5.3 Financial Aspects of Operation and Maintenance

From the current financial status and the increasing advertising revenue in ARTTC and ARS, both organizations are financially sound. BMS and GTS have secured sufficient budgetary allocation for maintenance costs from their supervisory organization, the Department of Finance of Anhui province (Tables 12 and 13). Thus, the foregoing organizations are not judged to have financial problems in regard to project sustainability.

Table 10: Financial Status of ARTTC

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	117	324	403	549	647	838
Sales: Advertising	NA	1	5	10	21	28
Sales: Others	NA	323	398	539	626	810
Subsidy	NA	0	0	0	0	0
Other income	NA	0	0	0	0	0
Total annual expenditure	140	313	379	506	579	743
Employment cost	NA	102	121	169	187	223
Program production, purchase	NA	16	23	19	21	26
Maintenance cost	NA	1	1	1	1	2
Money paid to government	4	7	6	18	21	20
Other costs	NA	187	228	299	349	472

Source: Documents provided by executing agency.

Table 11: Financial Status of ARS

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	76.4	188	256	294	346	337
Sales: Advertising	54	154	208	244	267	229
Sales: Others	1	0	0	0	0	0
Subsidy	21	34	48	50	79	103
Other income	0.4	0	0	0	0	5
Total annual expenditure	72.7	184	258	295	335	330
Employment cost	32	23	26	35	41	56
Program production, purchase	39	14	10	14	14	11
Administration expense	0	99	188	179	229	214
(share of maintenance cost)	0	(4)	(5)	(7)	(8)	(2)
Investment for fixed asset	0.4	17	5	24	7	15
Money paid to government	0	1	5	5	13	27
Other costs	1.3	30	24	38	31	7

Source: Documents provided by executing agency.

Table 12: Financial Status of BMS

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	NA	2.7	3.3	2.9	2.4	4.2
Subsidy	NA	2.2	2.7	2.4	2.0	3.5
Other income	NA	0.5	0.6	0.5	0.4	0.7
Total annual expenditure	NA	2.6	3.1	2.8	2.3	4.1
Employment cost	NA	0.9	1.1	1.0	0.8	1.4
Administration expense	NA	1.7	2.0	1.8	1.5	2.7
(share of maintenance cost)	NA	(1.5)	(1.8)	(1.7)	(1.4)	(2.4)
Other costs	NA	0	0	0	0	0

Source: Documents provided by executing agency.

Table 13: Financial Status of GTS

(unit: 10 thousand yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	NA	22	25	32	34	42
Sales	NA	0	0	0	0	0
Subsidy	NA	22	25	32	34	42
Total annual expenditure	NA	21	22	26	29	36
Employment cost	NA	NA	NA	NA	NA	NA
Maintenance cost	NA	10	11	12	14	14
Other costs	NA	NA	NA	NA	NA	NA

Source: Documents provided by executing agency.

3.5.4 Current Status of Operation and Maintenance

The current status of operation and maintenance in ARTTC, ARS, BMS, and GTS is satisfactory. The aforementioned technical rules mandated by national and organizational regulations are observed. Maintenance work and repair work (including procurement of spare parts) are also on track. Thus, the four organizations are not judged to have problems in regard to operation and maintenance of equipment.

On the basis of the aforementioned facts, no major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance system. Therefore, the sustainability of the project effects is high.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

The objective of this project was to improve television and radio broadcasting programs in Anhui province with respect to both quantity and quality through renovation of equipment of the ARTTC, ARS, BMS, and GTS as well as through the training in Japan, thereby contributing

to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in Anhui, and also to the promotion of mutual understanding between China and Japan. This project was highly relevant for China's development plans, development needs, and Japan's ODA policy; therefore, its relevance is high. Whereas the project cost was within the plan, the project period exceeded the plan; therefore, its efficiency is fair. Both the population coverage rate and the viewership that were set as the project target criteria have been steadily increasing, making the project more effective. The efficiency of program production has improved, and the incidence of unforeseen accidents during the broadcasting operation decreased owing to the renovation of equipment and facilities in all the four organizations. With respect to broadcasting content, the extension of the equipment and facilities such as channel addition as well as the employment of the outside broadcast van has allowed the broadcasting station to produce audience-friendly programs, resulting in the improvement of program quality. The improvement of these programs both with respect to quantity and quality has contributed to the advancement of education, cultural enrichment, and knowledge enhancement for the citizens in Anhui to a certain extent; therefore, the effectiveness and impact of the project are high. Regarding the operation and maintenance of broadcasting services, no major systemic, technical, and financial problems have been observed; sustainability of the effectiveness of the project is thus high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to Executing Agency

None.

4.2.2 Recommendation to JICA

None.

4.3 Lessons Learned

(1) The need for risk analysis in implementation of components with high uncertainty:

The project aimed at the promotion of mutual understanding between Japan and China by the purchase and broadcasting of Japanese music with a budget of 1.4 million yen at the appraisal stage (interview with the executing agency). However, the plan was not implemented because of a change in the related laws introduced by the government. The project needs a careful investigation of the origin and the level of the risk that may limit the implementation of the project component, particularly the component that is vulnerable to the legal systems such as administrative approvals and licenses such as the purchase cited earlier.

For instance, the policies and institutions related to purchase of foreign countries' broadcasting content, which substantially influenced the decision to not purchase Japanese music, were not expressly recognized as a project risk. Later, JICA conducted a study on the legal systems governing the purchase and broadcasting of programs produced in foreign countries to understand the limitations introduced by the government and to analyze possible means to facilitate the purchase. Because the objective of the promotion of mutual understanding between the two countries by broadcasting Japanese music appeared to reinforce the bilateral cooperation project, the aforementioned information collection as well as the subsequent information sharing between two countries regarding a feasible implementation plan for the purchase was essential.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs Hard components	<ARTTC> ・Cables (fiber cables, coaxial cables, transmitters, etc.) (Total 3 packages) <ARS> ・Studio equipment (lighting, digital cassette/CD recorders, editing facilities, etc.) (Total 4 package for ARS, BMS, GTS) <BMS> ・Monitoring equipment (broadcasting monitor, video analyzers, receivers, etc.) <GTS> ・Transmitting equipment (televisors, signal monitoring systems, adjusters, audio-video switchers, audio-video dischargers, microwave transmitters, microwave receivers, etc.)	<ARTTC> ・Cables (fiber cables, coaxial cables, transmitters, etc.) (Total 7 packages) <ARS> ・As planned <BMS> ・As planned <GTS> ・As planned
Soft components	<ARTTC> ・Training in Japan (cable TV engineering and management: 2 months×3 persons) <ARS> ・Training in Japan (equipment maintenance and engineering: 3 months × 2 persons, recording techniques and device maintenance: 3 months×1 person, network engineering and management: 3 months×1 person) ・Purchase of Japanese music <GTS> ・Training in Japan (TV transmitting engineering: 3 months × 1 person, TV broadcasting transmitting engineering: 3 months×1 person, TV broadcasting management: 3 months×1 person)	<ARTTC> ・10 persons × 12 days, cable TV engineering and management, visits to broadcast stations <ARS> ・10 persons ×12 days, equipment maintenance and engineering, recording techniques and device maintenance, network engineering and management, training on program planning, visits to broadcast stations <GTS> ・10 persons ×12 days, training on transmitting engineering, visits to transmitting stations <BMS/ APPRFTA > ・10 persons ×12 days, training on management of broadcast organization, visits to broadcast stations

Consulting service	(a) Technical assistance in procurement (1) Preparation of detailed design (D/D) and pre-qualification (P/Q) documents (2) Evaluation of P/Q results (3) Preparation of tender documents (4) Evaluation of tender results (b) Technical assistance in training (1) Implementation of the training in Japan	(a) Technical assistance in procurement ・As planned (b) Technical assistance in training ・As planned
2. Project period	March 2004–December 2009 (70 months)	March 2004–January 2011 (83 months)
3. Project cost amount paid in foreign currency Amount paid in local currency Total Japanese ODA loan portion Exchange rate	 3,301 million yen 2,029 million yen (142 million yuan) 5,330 million yen 3,301 million yen 1 yuan ＝14.3 yen (as of September 2003)	 3,250 million yen 1,972 million yen (142 million yuan) 5,222 million yen 3,250 million yen 1 yuan ＝13.9 yen （average between 2007 and 2011)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Broadcasting Infrastructure Improvement Project (Jilin Province)"

External Evaluator: Yukako Matsuura, International Development Center of Japan Inc.

0. Summary

The goal of this project was to improve the broadcasting programs of Jilin Province both in quantity and quality in order to enhance levels of education, knowledge, and culture of the citizens and to deepen mutual understanding between Japan and China, by supporting innovations in equipment and providing training opportunities to the Jilin TV Station, Jilin Education TV Station, and Jilin TV University. The project was in line with China's development policies and needs as well as Japan's ODA policy; therefore, the project is relevant. The project was completed within the planned budget and the planned period; thus, its efficiency is high. The upgrading of broadcasting equipment (hardware) and skills (software) appears to have contributed considerably to increasing the levels of education, knowledge, and culture of the citizens. The degree of the project's impact on promoting mutual understanding between ordinary citizens of Japan and China could not be precisely assessed because the overall number of foreign programs in broadcasting has been decreasing, including programs with Japanese contents. Nonetheless, training in Japan and coproduction opportunities facilitated the collaboration between Japanese and Chinese broadcasting stations, and the broadcast coproduced program as well as the contents that introduced Japanese culture and entertainment seem to have promoted a mutual understanding of the two nations to some extent. The effectiveness and the impact of the project are therefore high. Institutional, technical, and financial sustainability is excellent and ensured the sustainable impact of the project.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location

Recording of a show at Jilin TV Station

1.1 Background

The broadcasting stations in China are operated at central, provincial, prefectural, and county levels

and are supervised by governments at the corresponding levels. While broadcasting already had a significant impact on citizens in China with national television coverage reaching 94% of the population in 2001, the Government of China aimed to increase that coverage to 97% by 2010 to improve the communication of information and cultural and living standards through broadcasting for further socioeconomic development. Jilin Province, the target region of the project, had a population of 26.37 million people in 2001 and had achieved an average 10% GDP annual growth from 1996 to 2000 under the 9th Five-Year Plan. The province had a certain competitive edge in domestic and external markets supported by vast agricultural production (Jilin was named as "a leading agricultural province") and by rapidly growing industries such as automotive and petrochemical industries where Japanese firms promoted business consortiums. The broadcasting sector had been considered as key to extending knowledge about culture, education, disaster preparedness and prevention, science and technology, and to promote cultural exchange; accordingly, a broadcasting network and system was already established to a considerable extent. Nevertheless, the broadcasting profitability in the province was lower than the national average. Dominantly analog facilities and equipment were becoming obsolete owing to a financial shortage. This outdated technology created problems for program production including educational programing.

Under the circumstances, the project was implemented to improve the broadcasting programs of Jilin Province both in quantity and quality so that it would enhance the levels of education, knowledge, and culture of the citizens, and deepen mutual understanding between Japan and China. The project also planned to introduce Japanese broadcasting technology and equipment to China through the Special Terms for Economic Partnership (STEP).[1]

1.2 Project Outline

The objective of this project was to improve the broadcasting programs of Jilin Province both in quantity and quality, thereby contributing to enhancing the levels of education, knowledge, and culture of the citizens, and by deepening mutual understanding between Japan and China.

<ODA Loan Project>

Loan Approved Amount/ Disbursed Amount	4,375 million yen / 4,332 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	March 2004 / March 2004	
Terms and Conditions	Interest Rate	0.75%
	Repayment Period (Grace Period)	40 years (12 years)
	Conditions for Procurement:	Prime contract: Tied (Japan) Subcontract: General Untied

[1] JICA approved five other broadcasting projects in China at the same time as the Jilin project. The target areas of these five projects were Jinan City of Shandong Province, Qinghai Province, Yunnan, Anhui Province, and Ningxia Hui Autonomous Region.

Borrower / Executing Agency	Government of the People's Republic of China/People's Government of Jilin Province
Final Disbursement Date	August 2012
Main Contractor (Over 1 billion yen)	n/a
Main Consultant (Over 100 million yen)	n/a
Feasibility Studies, etc.	"Feasibility Research Report: Project of Jilin Province Radio & TV System and Electrified Education Carrying Out Equipment Innovation by Using of Japanese Government's Loan" by Jilin Province Technological Company of Engineering Consultation in June 2003.
Related Projects	Grassroots Grant Aid (JPFY1997) "The Improvement of Broadcasting System for Jilin Education Television (Jilin Province)" (91,485 USD)

2. Outline of the Evaluation Study

2.1 External Evaluator

Yukako Matsuura, International Development Center of Japan Inc.[2]

2.2 Duration of Evaluation Study

Duration of the Study: August, 2014 – January, 2016

Duration of the Field Study: November 30 – December 9, 2014, and March 9 – March 13, 2015.

3. Results of the Evaluation (Overall Rating: A[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of China

The Government of People's Republic of China in its national and provincial policies has emphasized the importance of television and radio broadcasting as a means to consistently accelerate and expand developed living, from the time of the 10th Five-Year Plan (2001–2005), which was effective at the project appraisal, to the 12th Five-Year Plan, which was effective at the ex-post evaluation (2011–2015). For the current 12th Five-Year Plan, the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China (SAPPRFT) set a clear target to attain 99% radio and television coverage of the population by 2015 in order to improve quality of broadcasting and digitalize communication infrastructures including broadcasting. Strong emphasis was placed on improving broadcasting quality and quantity from the project appraisal to the ex-post evaluation. In particular, Jilin Province has taken the initiative to bolster broadcasting in collaboration with the private sector for the growth of the media industry.

[2] The evaluator belongs to International Development Solutions, Inc., and supported International Development Center of Japan Inc., with this ex-post evaluation.

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

Based on the above facts, the consistency between the development policies of national and provincial governments and the project has been maintained from the appraisal to the ex-post evaluation.

3.1.2 Relevance to the Development Needs of China

From the project appraisal to the ex-post evaluation, broadcasting in Jilin Province, which is regarded as a crucial sector for social and economic development, has functioned as a major communication means of disseminating knowledge on culture, education, disaster preparedness/prevention, and science and technology, and to promote cultural exchange. In addition to broadcasting, which targets a general audience, the province also aimed to bolster human resource development and education levels in the province by strengthening the functions of Jilin Education Television and Jilin Television University. These needs were unchanged throughout the project. The profitability of the broadcasting sector in Jilin was lower than the national average at the project appraisal. Moreover, the facilities and equipment were dominantly analog owing to a budget shortage, which led to a low quality of broadcasting technology and infrastructure and significantly hindered program production. Under such circumstances, this project was relevant to the needs of the broadcasting sector in Jilin Province. The project did upgrade hardware and improved production quality and efficiency with the installation of new facilities and devices.

Japanese products such as video cameras, recorders, monitors, and switchers were regarded as top-ranking products in the Jilin broadcasting industry and were well known for easy maintenance. In particular, video cameras and recorders were considered to have minimal competition in the marketplace. The application of STEP conditions was therefore regarded to be relevant with unchanging high standards and advantages of Japanese products throughout the project from the appraisal to the ex-post evaluation. Advanced information technology and new media have recently become major means for production, broadcasting, and data storage. As a result, the necessity of video recorders and some other equipment has started shrinking. Moreover, Chinese manufacturers of broadcasting equipment have made rapid progress in the market; accordingly, the comparative advantage of Chinese products is increasing, particularly in terms of cost performance.

3.1.3 Relevance to Japan's ODA Policy

At the project appraisal, Japan's Economic Cooperation Program for China set policies to provide stimuli for promoting the market economy and expanding economic relations with private sectors, with which the project purpose aligned. The project also intended to increase human resource development through the support of Jilin TV University, and therefore was in line with the Medium-Term Strategy for Overseas Economic Cooperation Operations of JICA 2002–2005 and the Country Assistance Strategy for China (2003) that listed human resource development as a prioritized agenda item for cooperation.

From the above, this project has been highly relevant to the China's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The project assisted Jilin TV Station, Jilin Education TV Station, and Jilin TV University in two aspects: (1) a "hard component" of upgrading broadcasting equipment and facilities and (2) a "soft component" of training programs for their staff. A comparison between the project plan and the actual output is as follows:

(1) Upgrading "Hard Component" (Strengthening the broadcasting infrastructure)

Table 1: Planned and Actual Project Output (Hard Component)

	Planned Output	Actual Output（Underline indicates changes）	Reason for change
Jilin TV Station (JLTV)	・Facilities of broadcasting center (studio renovation, elevators, air conditioners, etc.) ・Studio equipment (digital cameras, recorders, editors, monitors, etc.) ・Broadcasting van ・Construction of broadcasting center (ODA loan not applied)	・Facilities of broadcasting center (studio lighting, TV transmitting equipment, elevators, air conditioners, uninterruptible power system, etc.) ・Studio system and digital TV broadcasting system (digital cameras, recorders, editors, monitors, etc.) ・Digital radio recording and transmitting system* ・Media resource control system（added) ・Broadcasting van ・Construction of broadcasting center (ODA loan not applied)	・Urgent procurement became necessary with air conditioning system, power supply system, and transformers along with the construction schedule of broadcasting center (ODA loan not applied). While these items were eventually procured with their own budget for timely installation, end devices such as air conditioners and UPSs were covered by the ODA loan as planned. ・The balance generated by the change was allocated to additional devices such as media resource control system (IT devices) and part of the digital radio recording and transmitting system.
Jilin Education TV Station (JLETV)	・Studio equipment (digital cameras, recorders, editors, nonlinear editing system, etc.)	・Studio equipment (digital cameras and editors) ・Broadcasting van with digital system (replacement of studio system) ・Nonlinear editing system	・Instead of studio systems with 3 and 4 channels, a broadcasting van with digital mobile system of 6 and 1 channels was added for outdoor recording at large events in various localities. ・Two high-definition television cameras were also added.

Jilin TV University (JLTVU)	・Studio equipment (virtual channel studio system, high-definition television cameras and recorders, digital captioning system, etc.) ・Construction of the university building (ODA loan not applied)	・Studio equipment (virtual channel studio system, high-definition television cameras and recorders, digital captioning system, digital audio workstation, lighting devices, etc.) ・IT system (computer server, network devices, video conference system, etc. *virtual channel studio system was canceled) ・Nonlinear editing systems for high definition and networks ・Office and classroom facilities (added) ・Construction of the university building (ODA loan not applied)	・Virtual channel studio system and high-definition television cameras turned out to be incompatible. The virtual channel studio system and some other accessory devices were canceled, and IT systems were alternatively added to meet the increasing needs for distance education through Internet.

Source: Documents provided by JICA and the executing agency (Questionnaire response)
* The items listed in the original plan were included in the digital radio recording and transmitting system.

The replacement of procurement items mentioned above was considered necessary and reasonable in light of the project purpose to improve broadcasting quality. Proper procedures were taken to replace the items; therefore, the changes were assessed as appropriate for enlarging the project effects. For example, the replacement of a studio system with a broadcasting van with a digital system enabled Jilin Education TV Station to produce programs that gave the audience a vivid impression as if they were in the broadcasting localities. Jilin TV University, in response to the rapidly growing needs of Internet users, decided to replace a virtual channel studio system with an IT system and video conference system. That change enabled the university to establish an IT backbone network and to greatly improve the conditions for distance learning and educational activities. It also made real-time communication possible with local TV universities.

(2) Strengthening “Soft Component” (Training programs for broadcasting personnel)

The soft component of the project was expected to provide opportunities for multiple purposes: training of technical personnel from the broadcasting stations and the university on program production and facility/equipment maintenance, training of executive personnel on improvement of broadcasting management and operations, purchasing of broadcasting rights of Japanese content, and coproduction with Japanese broadcasting stations. A comparison between the planned and actual outputs is presented below (Table 2):

Table 2: Planned and Actual Project Output (Soft Component)

	Planned Output	Actual Output（Underline indicates changes）	Reasons for change
Jilin TV Station (JLTV)	・ Training on program producing, editing, and broadcasting ・ Purchasing of broadcasting rights for Japanese content ・ Coproduction with Japanese broadcasting stations	・ Training and discussions on program producing and editing, high-definition TV technology, and media control (1 week × 40 persons, 2008–2009) ・ Participants: 10 staff of production and editing unit, 9 staff of media resource management unit, 10 technicians, and 11 executive members. ・ No purchase of broadcasting rights ・ No coproduction	・ Initial idea of training for the three entities were for total 15 persons (JLTV 11 persons, JLETV 2 persons, and JLTVU 2 persons) receiving 3-month training. However, in the end, JLTV 40 persons, JLETV 3 persons, JLTVU 2 persons visited Japan in several groups and took 6–10 days training. ・ The reason for shortening the training was because 3 months' absence of the core personnel in charge of the facilities was regarded as hindering the smooth implementation of the project as well as daily broadcasting operations. ・ Duration of the 3 months was also assessed as too long to acquire operational skills for the installed facilities and equipment. In fact, there was no trouble reported during and after the project in handling the facilities and equipment despite the shortened training time.
Jilin Education TV Station (JLETV)	・ Training on program producing, editing, and broadcasting ・ Obtaining content from the National Institute of Multimedia Education (NIME-WORLD) under Japan's Ministry of Education, Culture, Sports, Science and Technology	・ Training on program producing, editing, and broadcasting (approx. 1 week × 3 persons, 2008) ・ Coproduction of a program (4 crew members visited for shooting in March 2009 and produced a 30-min program titled "Environment-Friendly Lifestyle: Make It a Habit" with the support of NHK) ・ No program obtained from NIME-WORLD	
Jilin TV University (JLTVU)	・ Training on program producing, editing, and broadcasting ・ Collaboration with the Open University of Japan	・ Training on program producing, editing, and broadcasting (approx. 1 week × 2 persons, in 2008) ・ No collaboration with the Open University of Japan	

Source: Documents provided by JICA and the executing agency (Questionnaire response)

The number of training participants and duration of training were adjusted as noted above within the project framework in order to harmonize the timing of hardware installation and the soft component of the training schedule. Accordingly, the change was considered to be realistic and appropriate. On the one hand, the purchase of Japanese content could not be realized in the course of the soft component, owing to the restriction of imports and broadcasting of foreign programs that was enacted by the State Administration of Radio, Film and Television of the People's Republic of China at that time (currently SAPPRFT) after the project commencement. On the other hand, one program on environmental protection was coproduced between Jilin Education TV Station and Japan Broadcasting Corporation (NHK) and broadcast.

Some participants of the training in Japan commented on the necessity of allocating translators with sufficient knowledge of technical broadcasting terms, and possibly a few more such translators allocated in light of the participants' number to facilitate better absorption of skills and knowledge. These comments dealt with further improvement of the training but did not deny or reduce the effectiveness of the conducted training.

(3) Effect of STEP Application on Output

The project was implemented under the STEP rules specifying the prime contractor to be a Japanese firm (Japan-tied) and the country of origin rate of Japan to exceed 30% of the total contract amount. The rules were duly observed, and the share of the products of Japanese origin turned out to be 45.5%, which far exceeded the expected share of 32.4% at the appraisal. The satisfaction of the executing agency with the STEP application was high and was reported as follows: Japanese products and brands were numerously available in the broadcasting market; therefore, the procurement conditions were easily met. The contractors responded well to the procurement process and delivered goods and services promptly. The training and after-sale services were also appropriate.[5] However, there were some comments that the executing agency generally understood the STEP rules and procedures at the project appraisal, but that full comprehension of the detailed procedures was only possible at the implementation stage owing to their complexity. This, however, did not hinder the project implementation.

Setting up the large studio at Jilin TV Station

Japanese products yielding 90% of the studio

3.2.2 Project Inputs

3.2.2.1 Project Cost

The estimated total cost was 5,363 million yen, consisting of foreign currency of 4,375 million yen (namely, the Japanese ODA loan) and Chinese currency equal to 988 million yen. The actual total cost was 5,090 million yen (95% of the planned cost), including the facility costs for constructions of the Jilin TV Station broadcasting center and the Jilin TV University building (the

[5] Based on the STEP questionnaire response and interviews with the executing agency.

cost of engineering work is excluded) born by the China side but not by the Japanese ODA loan. The total Japanese ODA loan was 4,332 million yen, and thus was kept within budget (99% of the estimate).

Table 3: Planned and Actual Project Costs

(Unit: million yen)

Category	Planned				Actual			
	Foreign Currency	Local Currency	Total		Foreign Currency	Local Currency	Total	
	ODA Loan	Other Fund	Grand Total	ODA Loan	ODA loan	Other Fund	Grand Total	ODA Loan
Equipment	3,985	940	4,925	3,985	4,260	695	4,956	4,260
Training	17	0	17	17	43	0	43	43
Price escalation*	103	1	104	103	—	—	—	—
Contingency	205	47	252	205	—	—	—	—
Consulting services	65	0	65	65	23	66	90	23
TOTAL	4,375	988	5,363	4,375	4,328	762	5,090	4,328

Source: Documents provided by JICA and the executing agency (Questionnaire response)
* Price escalation is a reserved fund for a cost rise during times of inflation
Exchange rate: 1 yuan = 14.3 yen at appraisal. 1 yuan = 13.7 yen at ex-post evaluation (average of the loan period).
Note: The number indicated in actual foreign currency does not include the Japanese ODA loan commissions (0.1%). The numbers after the decimal points were rounded down, which caused a slight error in the total figure.

With regard to the balance between inputs of equipment, training, and consulting services, the executing agency prioritized the equipment followed by the training, but had no intention of requesting consulting services to assist with procurement procedures from the Japanese side. JICA entered negotiations with the executing agency to minimize the procurement package with consulting services, and finally fixed the cost for consulting services through the Japanese ODA loan to be 23 million yen, which was reduced to 35% of the originally allocated 65 million yen in the plan. The balance generated from this change was added to the training. The consulting services were provided in a way to ensure the compatibility of the procured equipment and facilities and the existing systems as well as the best match among the new devices, to specify the items in need of update with rapid advances in technology, and to thoroughly examine the adherence to specifications. As a result, the best-fitting products were installed to set up fully functional broadcasting systems, which led the higher satisfaction of the executing agency. In sum, the project inputs were assessed as appropriate.

In the course of procurement, the project added two packages of equipment for the Jilin TV Station, as shown in Table 4. This increased the total number of packages in the project to 10. Some of the devices were taken out from their original packages and placed in new packages with additional items to harmonize the package-based procurement with the construction progress of the broadcasting center and to sort the packages according to the responsible units of the equipment. The procurement method was also changed upon the rearrangement of packages to procure some items urgently for timely installation based on the schedule of engineering work in the construction

of the center: from procurement through International Competitive Bidding (ICB) with prequalification to ICB with post qualification.

The changes in the packages facilitated a smoother procurement because the packages were rearranged in line with units using the devices. Accordingly, the best person in charge of the devices could handle the procurement process in a responsive manner. The change in procurement methods was examined and duly approved in advance based on the confirmation of the following conditions: the estimated sum of the package would be less than 1 billion yen, the technical specifications of the procured items would be simple enough not to require a complex contract, and the post qualification would be ensured during the bidding with the support of the consultant. There were no problems observed in changing the procurement method.

Table 4: Comparison of Planned and Actual Procurement Packages

(Unit: million yen)

Package	Planned		July 2006		Actual		Remarks
	Total	Japanese origin products	Total	Japanese origin products	Total	Japanese origin products	
1. TV transmission equipment	261	81	261	81	374	41	
2. Studio equipment, broadcasting van	869	209	869	209	830	401	
3. Cameras and video equipment	285	285	285	285	313	291	
4. Building cabling system, air conditioning, power supply system, elevators	652	153	652	153	266	185	Some items were excluded from the list for self-fund procurement
5. Studio lighting system	321	29	321	29	413	10	
6. Studio system facilities, network system	1,156	391	1,156	391	827	564	
7. Equipment for Jilin Education TV Station	n/a	n/a	177	104	225	125	
8. Equipment for Jilin TV University	n/a	n/a	439	244	307	156	
9. Digital radio recording/broadcasting system for Jilin Radio Station	—	—	—	—	285	17	2 packages were added to the balance of Package 4
10. Media resource control system for Jilin TV Station	—	—	—	—	417	143	
Total	3,546	1,151	4,163	1,500	4,260	1,938	

Source: Documents provided by JICA and the executing agency (Questionnaire response)
Note: The numbers after the decimal points were rounded down, which caused a slight error in the total figure.

3.2.2.2 Project Period[6]

The executing agency and the Japanese side took time to discuss the range and contents of the consulting services, which caused a two-year delay in beginning procurement procedures, from the initially planned October 2004 to October 2006. As a result, the equipment procurement was greatly delayed. Nonetheless, the delay was recovered in a half year with the change in the procurement method, and all facilities and equipment were delivered by December 2009. Consequently, the project period was mostly as planned (Table 5).

Table 5: Actual and Planned Project Period

	Planned	Actual
Entire project	March 2014 (Signing of Loan Agreement)–December 2009 (70 months)	As planned
a) Procurement of equipment	October 2004–June 2008	October 2006–December 2009
b) Training	October 2004–December 2009	September 2008–April 2009 (Including coproduction tour)
c) Consulting services	April 2004–December 2009	February 2006–December 2008

3.2.3 Results of Calculations of Internal Rates of Return

The effectiveness of this project was expected to be measured by various aspects such as the upgrading of the broadcasting infrastructure; mutual understanding between Japan and China through training, obtained Japanese content, and coproduction; increase of public awareness of the environment and sanitation; advocacy of market rules, and so on. The internal rate of return was limited to measure these various effects quantitatively and comprehensively; therefore, the data was not calculated at the project appraisal or at the ex-post evaluation.

In sum, both the project cost and project period were within the plan. Therefore, the efficiency of the project is high.

3.3 Effectiveness[7] (Rating: ③)

Effectiveness of the project is assessed as follows based on the pre-decided operation and effect indicators at the appraisal (which include viewers, airwave coverage of the population, number of students at Jilin TV University, and other quantitative indicators) as well as an analysis of qualitative effects achieved by the TV stations and the university with regard to improvement in broadcasting programs and content for distance learning.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

The number of viewers and airwave coverage of the population reached its target percentage of

[6] In this ex-post evaluation, the completion of the project is defined as the completion of all project components, namely, procurement of equipment, training, and consulting services.

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.

97.5% by the target year 2011. The number of students at Jilin TV University was 43,074 in 2012, one year after the target year of 2011. This well exceeded the target of 38,000 students in 2011. Furthermore, the number of students in 2014 increased approximately 1.7 times over that of the appraisal. Therefore, the project is assessed to have achieved sufficient operational effect (Table 6). In addition, whereas the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China in the 12th Five-Year Plan aims to achieve a 99% airwave coverage of the total population by 2015, the Jilin Province had already attained 99.2% in 2011.

Table 6: Operation and Effect Indicators

Indicators	2003 Baseline	2011 Target Two years after completion	2009 At completion	2011 Two years after completion	2013 Most recent data
Viewers (Jilin Province)	2,116,000 households	3,500,000 households	2,961,000 households	3,500,000 households	4,400,000 households
Airwave Coverage (Jilin Province)	96.0 %	97.5 %	95.6 %	99.2 %	99.4 %
No. of students (Jilin TV University)	31,148 students	38,000 students	(2012) 43,074 students	(2014) 55,082 students	

Source: Documents provided by JICA and the executing agency (Questionnaire response)
Note: More details of the number of Jilin TV University students are as follows:
2012 New admissions: 18,001; Current students: 43,074; Graduated students: 10,430
2014 New admissions: 15,832; Current students: 55,082; Graduated students: 15,432

The quantitative indicators other than the above operation and effect indicators demonstrate a series of effects (Table 7). Both JLTV and JLETV have attained the targeted on-air hours owing to the introduction of 24-hour broadcasting. Programs targeting women also reached the goal number by 2011. JLTV could add one channel instead of the planned two, owing to disapproval by an upper authority. Nonetheless, the number of broadcasting hours was expanded by 1.6 times against the hours at the appraisal, and by 1.2 times against the targeted hours. In this ex-post evaluation, the increase in the entire broadcasting volume was weighted more than the number of channels, which would be regarded as collateral.

JLTV also achieved an increase in the self-production of programs and programs advocating market rules by 2013, several years after the 2011 target. For sectors such as disaster prevention and the environment, the dissemination of information was strengthened and increased through frequent public commercials rather than through programs. An increase in the frequency and volume of public information to raise awareness among the audience was confirmed through an interview with the JLTV staff: a program called "Safe Perspectives" and public commercials in approximately 15 slots/day disseminated information on disaster prevention and preparedness. In addition, a program called "One World Geography" and other public commercials in approximately 15 slots/day widely advocated environmental issues.

JLETV achieved its targets in 2011 to strengthen programs on disaster prevention,

environmental protection, public sanitation, and market rules. The self-production of programs is also considered to be enhanced despite the decreased number in Table 7 below. The evaluation unit of self-production at the ex-post evaluation is different from that at the appraisal. The introduction of eight self-produced, year-round shows currently provides approximately 400 programs (8 shows × 52 weeks = 416 programs) produced by JLETV, which means a much larger volume of self-production than the 32 programs/year at the appraisal. The station is therefore assessed to have achieved the expected target of self-production. Programs for ethnic minorities are currently provided by a satellite channels in the Korean language that specifically target ethnic Koreans living in Yeonbyeon. These programs are a dominant source of daily information for them. Under the circumstances, JLTV does not produce daily programs for the ethnic minorities owing to a very low demand for such programs. Instead, the station has covered the topics of ethnic minorities and their regions in a serial drama, "My Home at the Foothills of Changbai Mountain," which won a domestic award,[8] and in documentary programs such as "Changbai World," "Changbai Mountain." Additional documentary programs such as "Saman Culture" and "Songhua River," which capture the Manchurian culture, were pending approval for airing at the ex-post evaluation.

The broadcasting of programs made in foreign countries including Japan has decreased significantly both at JLTV and JLETV because the State Administration of Radio, Film and Televisions at that time tightened the regulation on broadcasting hours of foreign programs. Thus, purchasing and broadcasting those programs became difficult. Under such circumstances, it is noteworthy and highly appreciated that the staff at JLETV made efforts and succeeded in putting the 30-minute program "Environment-Friendly Lifestyle: Make It a Habit" on the air 10 times. This program was coproduced by JLETV and NHK through the project.

The Chinese government also set forth a guideline to strengthen the functions of the national broadcasting station, namely China Central Television (CCTV), to produce and broadcast programs for children. Accordingly, JLETV currently does not handle programs for children.

Table 7: Other Quantitative Indicators for Operational Effects

Indicators		2003 Baseline	2011 Target（2 years after completion）	2009 At completion	2011 2 years after completion	2013 Most recent available data
Self-produced programs	T	59/week	65/week	59/week	63/week	72/week
	ET	30/year	32/year	8/year	8/year	8/year
No. of channels	T	6	8	7	7	7
	ET	1	1	1	1	1
Broadcasting hours (per channel)	T	44,100 min./week	58,380 min./week	70,753 min./week	70,753 min./week	70,753 min./week
	ET	18 hours/day	20 hours/day	24 hours/day	24 hours/day	24 hours/day
Disaster-prev	T	0	1	0	0	1

[8] The domestic award "Five Masterpieces" recognizes excellent works produced by provinces, autonomous regions, and municipalities in the following five fields: theatrical play, TV drama, social science book, social science academic article, and movie.

ention/preparedness programs (year)	ET	3	5	8	10	10
Environmental programs (year)	T	2	3	1	1	1
	ET	3	6	8	10	10
Public health programs (year)	T	3	4	3	3	3
	ET	6	7	10	12	12
Market-rules programs (year)	T	2	4	2	2	4
	ET	2	4	5	5	5
Foreign programs (year)	T	34	48	0	0	0
	ET	14	14	2	1	1
Japanese programs (year)	T	4	12	0	0	0
	ET	2	3	2	0	0
Programs for ethnic minorities (year)	T	2	3	2	2	2
	ET	0	1	0	0	0
Programs for women (year)	T	0	1	1	2	4
	ET	5	7	10	12	12
Programs for children (year)	T	1	3	—	—	3
	ET	4	5	—	—	—

T: JLTV, ET: JLETV
Source: Documents provided by JICA and the executing agency (Questionnaire response)

3.3.2 Qualitative Effects

(1) Jilin TV Station (JLTV)

Jilin TV Station has attained digitalization of core devices for shooting, recording, editing, broadcasting, and storing; and has established a networking system by utilizing the equipment and facilities installed in the project, which have improved broadcasting quality in various aspects such as production efficiency, production and broadcasting techniques, direction and staging methods, and workflow management. For example, broadcasting vans have enabled mobile live broadcasting, relaying on-the-spot signals to other stations such as CCTV, and expanding broadcasting styles. The three broadcasting vans have been operated frequently: one van for news reporting and another for production are operated a few times per day, and the van for data transmission is used 15 to 16 times a month. These vans also served at a number of sports and cultural events, including for live reporting of the 2008 Olympic torch relay, international conferences, expos, and exhibitions. The installed large studio,[9] which is the biggest studio in the station, has been operated at full capacity for two permanent programs and one or two ad hoc events and programs per month.[10] The medium

[9] The large studio of 1,500 m^2 is equipped with facilities introduced by the ODA loan such as a lighting system, sound system, audience seats, and shooting devices. The cameras and devices in the screening room and sound room are primarily Japanese products.
[10] It takes a week to replace a stage set; therefore, four rounds per month is regarded as full capacity.

and small studios have also been used every day for recording and live broadcasting. Training opportunities in Japan were utilized to the utmost to acquire production and broadcasting methods and skills necessary for the installed facilities and equipment.

The training opportunities also achieved a significant impact on participants in encountering and absorbing the philosophy of program production, management of broadcasting enterprises, and the passion and professionalism of the staff in Japanese broadcasting stations. Participants shared their comments and opinions at the field survey for the ex-post evaluation as follows: the passion and professionalism of Japanese colleagues who devoted 10 years to make a one-hour documentary was impressive and stimulating; touring highly efficient and functional studios as well as old-style studios that still used obsolete tape recording opened their eyes to the fact that the quality of a program depended not only on the technology but also on the ideas and thoughts that the producer poured into the production. The training was deemed to have contributed to motivating the participants to take action toward better broadcasting.

JLTV won the important award for domestic broadcasting—"The Golden Sail Award"—in 2009 for its standout achievements in TV technologies and program quality in combination. The award recognized the comprehensive enhancement of broadcasting capacity of the station in both tangible infrastructure (hardware) and intangible capability (software), as officially acknowledged by a third party.

Studio monitor room during on-air operations, JLTV

Nonlinear editing room, JLTV

(2) Jilin Education TV Station (JLETV)

Jilin Education TV Station previously used old-style recording devices and linear editing equipment manufactured from the 1990s to 2000. As a result, the station produced plain and unimpressive programs that used simple recording techniques. The facilities of the station were greatly upgraded in quality and quantity through the project, which led to improvements in production efficiency, production and broadcasting techniques, direction and staging methods, workflow management, and so on. The broadcasting van, which replaced the originally planned studio system, has increased the mobility and efficiency of filming, recording, and editing and has diversified production methods. As a result, self-production at the station has significantly expanded.

The ceremony of the annual teachers' day on September 10 in the Jilin Province has been broadcast from the van for the past three years and was acknowledged by the Education Department of the Jilin Province. The van is mobilized 50 to 60 times per year (four to five times per month) on average to various sites in the province to produce such programs as "Disaster Prevention Exercise" and "Find the Model Teacher."

In addition to updating the facilities, the station also reviewed its production flow to standardize the work at each step, and improved operational procedures to increase its efficiency in program production. Some work in the production process that used to be outsourced is currently handled internally and self-reliantly by the staff because of the project. JLETV also had a chance to coproduce a program with NHK in addition to the training in Japan, through which the staff acquired advanced production techniques and were encouraged to produce and broadcast new content. The training is considered to have a positive impact on their production quality.

The station received "The National Teaching and Learning Award" in December 2014 for its program titled "On-Air Classroom," which aimed to train teachers in rural villages. The station also won first prize for the special theme in social education with the coproduced program "Environment-Friendly Lifestyle: Make It a Habit" with NHK. It is concluded that these programs were highly valued nationally for use at educational sites in rural villages where the quality and quantity of teachers was not sufficient, and also to raise awareness of environmental protection that is gathering attention across the country.

High-definition broadcasting van, JLETV

Program recording, JLETV

(3) Jilin TV University (JLTVU)

Before the project, JLTVU had only obsolete cameras and a linear editor manufactured in the 1970s and 1980s, of which the only linear editor often broke down. The facilities and equipment were greatly advanced by the project. The renewal of the facilities has also enriched the capacity of the technical staff and made it possible to produce and provide diverse curricula, multimedia educational software, flow-media educational software, etc. The project has also diversified the program content and expanded the number of serviceable regions. For example, it became possible to connect local broadcasting universities across the province and broadcast educational skill contests of teachers at the universities on a live network. The installation of the new

recording studio has improved the quality of recording and filming, which also ensured better access for students to distance learning with strengthened quality and an improved educational environment. The improved curriculum and better conditions for distance learning led to the quantitative effect of increasing the students by 1.8 times. The number of learning centers located in ethnic minorities' neighbourhoods[11] has also been increased by 1.8 times, from 8,911 sites in 2003 to 15,930 sites in 2014.

The project has enabled the university to produce qualified programs by their own personnel, whereas the university used to purchase technical assistance from outside vendors to create curricula and educational software. As a result of this reduced outsourcing, the university has now been able to cut down on expenses.

Distance learning classroom, JLTVU

Teaching skill contest of teachers, JLTVU

3.4 Impacts

3.4.1 Intended Impacts

(1) Educational Advancement, Knowledge, and Cultural Enrichment of the People

Interviews with the executing agency, and documents provided by them, reveal that the entire society has come to enjoy the benefits of material wealth, and that knowledge and the educational qualifications of the people have advanced. Accordingly, people have come to expect TV programs to be more entertaining as well as more informative, covering wider topics about society and daily life. Twenty to thirty years ago, the ordinary family had approximately five channels to watch; however, more than 100 channels are currently available owing to the introduction of the set-top box,[12] and the Internet further expands access to visual materials. Thus, today's audience has a vast number of options. Under such circumstances, the beneficiary survey[13] revealed that the audience in

[11] Yanbian, Tonghua, Baishan, Baicheng, Tongyu, Songyuan, Quian Gorlos, Daan, Fuyu, Changbai Mountain Administrative Committee are the areas where ethnic minorities reside.

[12] A set-top box is a device that converts signals from different broadcasting venues such as cable TV, satellite, ground-wave, and IP into an audible signal to broadcast on regular TV.

[13] The beneficiary survey was conducted in December 2014 at 10 locations in three cities, namely Changchun, Jilin, and Siping, by enumerators filling out a preset interview sheet. The number of valid responses was 42 in Changchun (male 20, female 22), 34 in Jilin (male 16, female 18), and 28 in Siping (male 14, female 14). The total number of respondents was 104 (male 50, female 54). The main contents of the interview dealt with the state of TV/radio watching and listening, evaluation of programs of JLTV and JLETV, and knowledge about and interest in foreign countries (the United States of America, Korea, and Japan) in relation to the TV programs.

Jilin Province expected JLTV and JLETV to sufficiently cover local news and topics at first and to present easy-to-follow programs next. In responding to these expectations, both stations have expanded their programs focusing on local-level social and cultural programs, including those about local traditional culture. These programs are deemed to have made a significant impact on the enrichment of education, knowledge, and culture in the province.

JLTV has increasingly an elder audience over 55 years old. Accordingly, JLTV has expanded its programming to enjoy and deepen an understanding of local traditional culture, reflecting the trend of the audience. This programming includes elaborate programs such as "Blossoms of Peach and Plum" that introduce traditional culture and acrobatic performances, and Jilin musicals and traditional comedies in northeast China such as "Two Zhuancong Mobilization." The station also expanded its science education and cultural programs to meet the demand of its better-educated audience that is increasing in both urban and rural areas. Among these programs, the aforementioned shows focusing on ethnic minorities are included, such as the drama "My Home at the Foothills of Changbai Mountain," and a documentary, "Saman Culture." Practical and useful topics in daily life such as disaster preparedness and environmental protection are also covered in programs as "Safe Perspectives" as well as in public commercials that are aired more frequently. For example, disaster-related public commercials were broadcast 5,316 times in 2013, and environment-related commercials were aired 6,298 times in the same year.

According to the beneficiary survey, 90 respondents (87%) out of 104 reported that they watch JLTV, and 30% of them watch programs related to education, culture, and daily living almost every day, while 50% of the respondents watch these programs several times a week. The respondents rated the value of the JLTV programs[14] as follows, from the top: abundant local information (80%), easy-to-follow contents (53%), and sufficient number of programs on education, culture, and daily living (22%). Compared with the programs of 5 to 10 years ago, the top three remarkable improvements were rated as follows: more local information (62%), easier content (38%), and a greater variety of programs available (33%). A program frequently noted as very useful was a news program called "Catcher City," with 25 respondents (approximately 30% of total respondents).

JLETV has contributed to enhancing the knowledge of citizens in Jilin Province by meeting the needs of educators, students, and their parents preparing for entrance exams, youth, and the rural population with a less-developed educational environment.[15] Programs focusing specifically on promoting education in rural areas have been produced in recent years; these programs include "Lectures by Famous Teachers" and "On-Air Classroom," which are broadcast to the entire province through the cable network. These programs have contributed to upgrading the basic educational level in Jilin Province.

[14] The top three were selected from nine options.

[15] Educational programs are as follows: "Dialogue and Growth" to provide youth with opportunities to share their concerns and have counseling; "Interview with Professionals" to provide educators with hot issues in education policies and topics presented by education professionals; "Talk About the World" to report interesting domestic news; "Our Show Time" to introduce university life, culture, and artwork of university students, coproduced with university students with occasional campus events; "Guide to University Entrance" to provide guidance to students who are taking entrance exams and their parents.

At JLTVU, the number of students registered in formal education courses as law, business administration, and public administration have increased by 1.8 times. Nonformal adult education courses have also been expanded, from 10 to 13 courses. Moreover, JLTVU has also set up new vocational courses to issue certificates, and a preparatory course for prospective social workers funded by the department of civil affairs of Jilin Province. The number of students attending nonformal education courses has increased by 2.5 times, as shown in Table 8. The project has brought a tangible impact to JLTVU that contributes to the rise in the educational level of the Jilin constituencies.

Table 8: Main Courses and Number of Students at JLTVU

	2003 (at appraisal)	2012 (at completion)	2014 (2 years after completion)
Formal Education Courses			
No. of courses	386	476	532
No. of students	31,148	43,074	55,082
Top 3 popular courses	Law (constitutional law, jurisprudence, criminal procedural law)	Business administration (finance, basic and advanced computer skills, statistics)	Public Administration (public administration, office management, basic management)
Nonformal Education Courses (Adult Education)			
No. of courses	10	12	13
No. of students	10,000	20,000	25,000
Top 3 popular courses	Electrical engineering, welding, hazardous chemicals	Electrical engineering, welding, hazardous chemicals	Electrical engineering, welding, hazardous chemicals

Source: Documents provided by the executing agency (Questionnaire response)

(2) Collaboration Between Japanese and Chinese Broadcasting Stations

JLTV had signed the Friendly Cooperation Agreement between Tohoku Broadcasting of Japan for five years from 2012. The exchange of missions for mutual visits has already started; this marks the beginning of collaboration between the two stations based on the Agreement. Despite the regulations of the State Administration of Press, Publication, Radio, Film and Television on collaboration and coproduction with foreign broadcasting stations including Japanese stations, there has been consistent expectation for cooperation if allowed, with Japanese broadcasting stations, from the appraisal to the ex-post evaluation.

(3) Deepening Mutual Understanding Between Japan and China

JLTV broadcast a program called “Northeast Asia” and introduced Japanese culture and trends, which facilitated the audience’s interest in and concerns particularly about healthy lifestyle and food culture in Japan. In entertainment, Japanese movie stars such as Momoe Yamaguchi and Ken Takakura are reportedly quite popular and respected among the Chinese audience. Moreover, Jilin Province has been a friendship province of Miyagi Prefecture, and after the Great East Japan Earthquake, the leaders of Jilin Province visited to express their condolences to the

Consulate-General of Japan in Shenyang as well as the disaster-affected areas. This was broadcast several times on the news programs at that time. In addition, the coproduced program between JLETV and NHK won "the First Prize for Special Theme in Social Education" by the Ministry of Education. This is regarded as a positive impact on mutual understanding between the two nations to some extent.

The beneficiary survey revealed that TV viewers in their 20s, 30s, and 40s were interested in Japanese culture such as music, drama, and movies. A satellite channel of the JLTV broadcast special programs featuring Japanese major stars; this had perhaps some influence on the audience in encountering Japanese entertainment. However, it is difficult to estimate how far the programs contributed to generating a positive impression of Japan and to promote mutual understanding between Japan and China. Forty percent of the respondents in the beneficiary survey indicated that their impressions of Japan got better or slightly better.

The beneficiary survey also revealed that television (among other means such as the internet, radio, and newspapers[16]) was the most used means in Jilin Province to obtain information about foreign countries including Japan. From this result, the project is assessed effective to have focused on television broadcasting rather than other media.

Box: Coproduced Program "Environment-Friendly Lifestyle: Make It a Habit"

JLETV dispatched a crew of four production and editing staff to Japan for two weeks to cover waste management systems in Japan and to make a program titled "Environment-Friendly Lifestyle: Make It a Habit." The 30-minute program introduces the flow of waste management from the household to a final landfill: garbage sorting and recycling in the household, collection and transportation by the local municipality, incineration of burnable waste and heat utilization generated in the process, collection of reusable iron and aluminium during the processing of incombustible waste, and the final landfill. The program contains interviews with citizens, officers of the municipality, the Ministry of the Environment, and a private waste management company. The program emphasizes the importance of coordinated actions among government, business, and households for waste reduction and environmental protection.

The crewmembers recalled their surprise when they saw no waste scattering. This occurred not only in houses but also on tiny pathways and in public places, where cleaners wearing spotless uniforms collected waste. The core message put into the program was that an environment-friendly lifestyle started with the small practices of individuals in daily life to try to reduce waste and recycle it as much as possible, and that this environmental awareness should be taught from childhood to make these small practices a habit. The program also demonstrates a powerful message through visual content, provided by NHK, of environmental pollution and its impact on the human body, such as the *Minamata* diseases experienced by Japanese during the period of

[16] Asked about the main source of obtaining information about foreign countries, exemplified by the Unites States, Korea, and Japan, 62% of the total respondents chose television, 39% chose the Internet, and 37% chose newspapers/magazines (with multiple answers). This indicated the advantage of television as a media to promote understanding of foreign countries.

rapid economic growth. Visual presentations that compared the situation before and after the introduction of environmental protection policies made the message more convincing.

3.4.2 Other Impacts

Another positive impact of the project is a dramatic increase in advertising revenue: JLTV increased its revenue by 4.9 times, and JLETV by 5.4 times. JLTV gradually expanded its channels from five in 2002 to six in 2003 and then to seven in 2007. It also realized 24-hour broadcasting in 2008 and extended its broadcasting hours by 1.6 times, which quadrupled the advertising hours. JLETV has still run one channel, but has also increased advertising hours owing to the introduction of 24-hour broadcasting. Moreover, improvement in program quality by the project has increased the value of advertising, which attracts more clients. Consequently, advertising revenues have increased.

There have been no negative impacts on the natural environment, and no resettlement occurred throughout the project.

This project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

JLTV, JLETV, and JLTVU have consolidated their institutional framework for operation and maintenance, in which respective technical departments in charge of maintenance of equipment and facilities operate in close coordination with production units (Table 9).

Table 9: Operation and Maintenance Structure of the JLTV, JLETV, and JLTVU

JLTV	Under the supervision of the Administration of Press, Publication, Radio, Film and Television of Jilin Province, JLTV is in charge of facilities and equipment. JLTV has 875 staff, of which 17 are assigned to the technical department and play a key role in maintenance with technical staff assigned to departments operating the devices; namely the production department, broadcasting department, and network control department.
JLETV	Under the supervision of the Education Department of Jilin Province, JLETV is responsible for facilities and equipment. Eight staff of its technical production department, out of 128 total staff, take the lead in operation and maintenance with the staff in the chief editor's room, program center, broadcasting department, new media department, etc.
JLTVU	Under the supervision of the Education Department of Jilin Province, JLTVU is responsible for facilities and equipment. JLTVU has 160 staff, both teaching and administration personnel, and has established a new center for distance-learning

	technology along with the project, in which 17 staff play a key role in operation and maintenance in collaboration with the teaching department. In the center, four officers of the network administration unit and two chief technical officers operate and maintain the IT system, and provide support to the local broadcasting universities over the province. Five staff in the TV production unit are responsible for the maintenance of broadcasting equipment.

Source: Documents provided by the executing agency (Questionnaire response)

3.5.2 Technical Aspects of Operation and Maintenance

Technical personnel have been assigned to relevant sections for technical support, production, broadcasting, and so on at JLTV, JLETV, and JLTVU for operation and maintenance. JLETV and JLTVU have on some occasions received support from manufacturers depending on the malfunctioning conditions, after their own technical personnel assessed whether external support is necessary. Moreover, JLTV, JLETV, and JLTVU all have regulations and manuals on operation and maintenance that are referred to widely during routine operation and used during training sessions. In short, technical sustainability is sufficiently ensured for all entities for operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

Income and expenditures have been greatly expanded at JLTV, JLETV, and JLTVU compared with those at appraisal (Tables 10–12). With regard to income, JLTV and JLETV have substantially increased their advertising revenue. JLTVU, which has no advertising revenue, also has increased governmental subsidy and tuition revenue.

JLTV and JLETV have already set their sights on the 13th Five-Year Plan (2016–2020) and the realization of high-definition technology at all steps of producing and broadcasting, and have started investing in equipment for upgrades with their own budgets. JLTVU also plans to update the facilities at its new campus. For this purpose, expenditures at JLTV and JLTVU exceeded their incomes in 2013; thus, their balances ended in deficits. Nonetheless, the deficits are confirmed to be unproblematic for financial stability and the loan repayment plan because the deficits were for a temporary period to update equipment to catch up with advances in technology. Maintenance costs and personnel costs have also been ensured, and financial sustainability is secure.

Table 10: Financial Revenue and Expenditures of JLTV

(Unit: million yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	16,114	56,111	63,924	72,102	78,191	79,337
Advertising revenue	16,106	55,739	63,393	71,800	77,800	79,000
Other Business revenue	0	0	0	0	0	0
Government subsidy	0	0	0	0	0	0
Other revenue	8	372	531	302	391	337
Total annual expenditures	13,939	49,135	61,739	59,027	72,582	93,056
Personnel expenses	2,015	5,967	6,251	6,494	7,147	11,089
General overhead	2,045	3,475	3,526	3,908	3,977	4,374
(Incl. maintenance cost)	N/A	N/A	N/A	N/A	N/A	N/A
Program production cost	0	10,883	11,616	13,622	16,072	16,367
Program purchase cost	0	11,026	12,697	12,694	17,437	21,813
Capital investment	2,000	1,909	2,700	1,446	1,953	8,551
Satellite lease cost	270	479	325	341	538	369
Networking cost	0	6,502	8,865	9,510	10,563	9,940
Interest on borrowing	0	1,961	4,281	5,083	5,795	5,993
Maintenance cost	449	748	1,394	673	448	387
Other expenditures	7,160	6,185	10,084	5,256	8,652	14,173

Source: Documents provided by the executing agency (Questionnaire response)

Table 11: Financial Revenue and Expenditures of JLETV

(Unit: million yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	780	2,300	1,537	1,340	2,050	2,372
Advertising revenue	360	1,666	1,383	925	1,740	1,973
Program production revenue	250	0	0	0	0	0
Other business revenue	170	0	0	0	0	0
Government subsidy	0	634	153	411	310	397
Other revenue	0	0	1	4	0	2
Total annual expenditure	610	1,936	2,002	1,721	1,656	2,240
Personnel expenses	80	566	527	483	649	758
General overhead	110	314	295	225	223	204
(Incl. maintenance cost)	0	17	9	18	12	0
Program production cost	80	613	610	611	425	665
Program purchase cost	150	264	173	124	134	416
Capital investment	120	60	299	215	86	74
Other expenditures	70	119	99	63	139	123

Source: Documents provided by the executing agency (Questionnaire response)

Table 12: Financial Revenue and Expenditures of JLTVU

(Unit: million yuan)

Item	2002	2009	2010	2011	2012	2013
Total annual revenue	1,365	4,720	7,242	7,595	9,189	6,609
Advertising revenue	0	0	0	0	0	0
Other Business revenue	0	0	0	0	0	0
Government subsidy	678	2,814	5,292	5,435	7,089	3,864
Tuition revenue	680	1,850	1,900	2,100	2,000	2,600
Other revenue	7	56	50	60	100	145
Total annual expenditures	1,366	4,895	7,200	5,598	6,252	10,322
Personnel expenses	577	1,198	1,295	1,394	1,723	1,871
General overhead	647	1,957	1,945	2,003	1,732	1,871
(Incl. maintenance cost)	65	48	69	53	16	268
Training expenditure	0	1	3	12	4	7
Research expenditure	0	0	0	1	2	3
Capital investment	135	27	129	100	86	640
Other expenditures	7	1,712	3,828	2,088	2,705	6,189

Source: Documents provided by the executing agency (Questionnaire response)

3.5.4 Current Status of Operation and Maintenance

Technical stability is ensured at all implementing agencies, where operation and maintenance have been carried out in a systematized manner with standardized manuals and regular checkups by their own and by manufacturers on demand. No operational inconveniences or maintenance troubles have been reported.

Among the installed equipment, there are currently some items, particularly IT devices, that have frequent breakdowns and cannot be well maintained owing to their lifetimes ending/ended, as well as the unavailability of spare parts in the end of life. The entities have already taken appropriate measures for such issues as renewing and replacing equipment using their own budget.

Consequently, the project is assessed to have no problems with operation and maintenance.

As reviewed above, no problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The goal of this project was to improve the broadcasting programs of Jilin Province both in quantity and quality in order to enhance levels of education, knowledge, and culture of the citizens and to deepen mutual understanding between Japan and China, by supporting innovations in equipment and providing training opportunities to the Jilin TV Station, Jilin Education TV Station, and Jilin TV University. The project was in line with China's development policies and needs as well as Japan's ODA policy; therefore, the project is relevant. The project was completed within the planned budget and the planned period; thus, its efficiency is high. The upgrading of broadcasting equipment (hardware) and skills (software) appears to have contributed considerably to increasing the levels of

education, knowledge, and culture of the citizens. The degree of the project's impact on promoting mutual understanding between ordinary citizens of Japan and China could not be precisely assessed because the overall number of foreign programs in broadcasting has been decreasing, including programs with Japanese contents. Nonetheless, training in Japan and coproduction opportunities facilitated the collaboration between Japanese and Chinese broadcasting stations, and the broadcast coproduced program as well as the contents that introduced Japanese culture and entertainment seem to have promoted a mutual understanding of the two nations to some extent. The effectiveness and the impact of the project are therefore high. Institutional, technical, and financial sustainability is excellent and ensured the sustainable impact of the project.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) To further strengthen the mutual cooperation between Japanese and Chinese broadcasting stations, JLTV is advised to take the initiative for more dialogue with Tohoku Broadcasting of Japan to expand personnel exchanges and to explore possible coproductions based on the friendship agreement.

(2) The coproduced program with JLETV and NHK "Environment-Friendly Lifestyle: Make It a Habit" can be used as an effective method for environmental education and advocacy in the growing national awareness and attention on environmental issues. The program was broadcast approximately 10 times in 2009. Environmental protection is a prioritized theme also for JICA and its assistance in China, and several JICA projects have been implemented that focused on the environment. JLETV is therefore advised to coordinate with the JICA China office for opportunities to utilize the program in JICA's environmental projects as well as any other occasions and events to promote collaboration between Japan and China.

4.2.2 Recommendations to JICA

(1) JICA is suggested to explore opportunities to use the JLETV program "Environment-Friendly Lifestyle: Make It a Habit" in ongoing environment-related JICA projects, the Sino-Japan Friendship Centre for Environmental Protection, and grassroots events to expand the output and assets of this project.

4.3 Lessons Learned

（1）Clarification of the roles of several entities involved in procurement of facilities and equipment

The project was for three different entities (JLTV, JLETV, and JLTVU) to procure facilities and equipment. Among the entities, JLTV in particular had various devices to be used for many purposes in different departments under different administrators such as facilities for the building, studio devices, and production equipment. Procurement packages had been arranged in a way to

clarify the administrators of the equipment/facilities and had also been rearranged flexibly with some replacements of the items to accommodate the progress of the building construction during the project. Moreover, the Administration of Press, Publication, Radio, Film and Television of Jilin Province took a strong leadership role in supervising the entire procurement process including the rearrangement of the packages. Because of these factors, the project probably has completed its procurement and other planned activities within the planned project duration. When a project involves several independent entities in the procurement, it is suggested that the roles and responsibilities of the different entities be clarified in advance and that the procurement packages be arranged in line with the entities and pre-decided clarification of the roles and responsibilities.

（2）Necessity to assign appropriate number of interpreters with knowledge of technical terms for training in Japan

During a group interview with the participants of the training in Japan, the assignment of interpreters with more knowledge of technical terms, and more interpreters in light of the number of participants, were proposed for better learning of technical skills for a future project. In the training for acquiring specialized knowledge and skills, particularly on advanced technology, interpreters are key to ensure that training is effective through sufficient explanation of the skills; therefore, it is suggested to pay significant attention to appointing interpreters with sufficient vocabulary, and in appropriate numbers.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs (Hard component)	< Jilin TV Station> ・Facilities of Broadcasting center (studio renovation, elevators, air conditioners, etc.) ・Studio equipment (digital cameras, recorders, editors, monitors, etc.) ・Broadcasting Van ・Construction of broadcasting center (ODA loan not applied) （Total 6 packages）	< Jilin TV Station> ・TV transmitting equipment ・Facilities of Broadcasting center (studio lighting, elevators, air conditioners, uninterruptible power system, etc.) ・Studio system and digital TV broadcasting system (digital cameras, recorders, editors, monitors, etc.) ・Digital radio recording and transmitting system* ・Media resource control system（added） ・Broadcasting Van ・Construction of broadcasting center (ODA loan not applied) （Total 8 packages）
	< Jilin Education TV Station> ・Studio equipment (digital cameras, recorders, editors, nonlinear editing system, etc.) （Total 1 package）	< Jilin Education TV Station> ・Studio equipment (digital cameras and editors) ・Broadcasting van with digital system（Replacement of studio system） ・Nonlinear editing system. （Total 1 package）
	<Jilin TV University> ・Studio equipment (virtual channel studio system, high-definition television cameras and recorders, digital captioning system, etc.) ・Construction of the university building (ODA loan not applied) （Total 1 package）	<Jilin TV University> ・Studio equipment (high-definition television cameras and recorders, digital captioning system, digital audio workstation, lighting devices, etc.) ・IT system (computer server, network devices, video conference system, etc.) *virtual channel studio system was canceled ・Nonlinear editing systems for high definition and networks. ・Office and classroom facilities (added) ・Construction of the university building (yen loan not applied) （Total 1 package）
(Soft component)	< Jilin TV Station> ・Training for program producing, editing, and broadcasting（3 months × 11 persons） ・Purchasing of broadcasting rights for Japanese content ・Coproduction with Japanese	< Jilin TV Station> ・Training and discussions on program producing and editing, high-definition TV technology and media control (1 week × 40 persons,) ・No purchase of broadcasting rights

	broadcasting stations <Jilin Education TV Station> ・Training for program producing, editing, and broadcasting（3 months × 2 persons） ・Obtaining content from the National Institute of Multimedia Education (NIME-WORLD) under Japan's Ministry of Education, Culture, Sports, Science and Technology <Jilin TV University> ・Training for program producing, editing, and broadcasting (3 months × 2 persons） ・Collaboration with the Open University of Japan	・No coproduction <Jilin Education TV Station> ・Training for program producing, editing, and broadcasting (approx. 1 week × 3 persons) ・Coproduction of a program (4 production crew visited for filming and produced a 30-minute program titled "Environment-Friendly Lifestyle: Make It a Habit" with the support of NHK) ・No programs obtained from NIME-WORLD <Jilin TV University> ・Training for program producing, editing, and broadcasting (approx. 1 week × 2 persons, in 2008) ・No collaboration with the Open University of Japan
(Consulting Service)	(a) Technical support in procurement ① Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ② Evaluation of P/Q results ③ Preparation of tender documents ④ Evaluation of tender results (b) Technical support in training and others ① Training in Japan ② Coproduction of programs with Japanese broadcasting stations ③ Purchase of Japanese programs and broadcasting rights	(a) Technical support in procurement ① Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ② Evaluation of P/Q results ③ Preparation of tender documents (b) Technical support in training and others ① Training in Japan ② Coproduction of programs with a Japanese broadcasting station
2. Project Period	March 2004–December 2009 （70 months）	As planned
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total	 4,375 million yen 988 million yen (69 million RMB) 5,363million yen	 4,328 million yen 762 million yen (56 million RMB) 5,090million yen

Japanese ODA loan portion	4,375 million yen	4,328 million yen
Exchange rate	1 RMB = 14.3 yen (As of September 2003)	1 RMB = 13.7 yen (Average between 2004 and 2012)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Broadcasting Infrastructure Improvement Project (Ningxia Hui Autonomous Region)"

External Evaluator: Yusuke Hasegawa, International Development Center of Japan Inc.

0. Summary

The goal of this project was to improve the quantity and quality of TV and radio programs in Ningxia Hui Autonomous Region by updating the broadcasting infrastructure and providing training to the staff of the broadcasting stations. This would contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in the Autonomous Region and also to the promotion of mutual understanding between China and Japan. The project was highly relevant to the development plans and development needs of China in a consistent manner from the appraisal to the ex-post evaluation, and also to Japan's assistance policy for China at appraisal; therefore, its relevance is high. More outputs were produced than originally planned because of a significant change in the execution plan during the implementation process in order to properly meet new needs emerging from advances in technology and the executing agency's expanded scope of business. Thus, the project cost appropriately reflected the outputs actually produced. The project period, however, significantly exceeded the plan; therefore, its efficiency is fair. The project significantly contributed to the improvement of the broadcasting programs in quantity and quality, and has had a certain observable impact; therefore, its effectiveness and impact are high. No major problems have been observed in the institutional, technical, or financial aspects of the operation and maintenance system; therefore, sustainability of the project effects is high. In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location

Ningxia Radio and TV Station (NXTV)[1]

[1] The Ningxia Television Station and the Ningxia Radio Station were integrated into the Ningxia General Radio and Television Station in 2005, which was renamed the Ningxia Radio and Television Station (NXTV) in 2014.

1.1 Background

Broadcasting stations in China operate at the central, provincial, prefectural, and county levels and are supervised by the corresponding governments. In 2001, television broadcasting covered 94% of the population. As an influential means of distributing information, broadcasting was already integrated into the everyday lives of Chinese citizens. With a view to enhancing the development of its society and economy, the Government of China had been working on the improvement of information access and cultural enrichment, setting a target to have more than 97% of the population in administrative villages covered by TV broadcasting by 2010.

The Ningxia Hui Autonomous Region is located in the northwest part of China and had a population of 5.7 million in 2002. It is one of the five autonomous regions in China that have a higher population of a particular minority ethnic group. In this autonomous region, the Hui people make up approximately 35% of the population, and many of them live in prefectures of poverty in the south. Income per capita in Ningxia Hui Autonomous Region was 5,804 RMB in 2002, which was substantially below the national average of 7,997 RMB (Source: documents provided by JICA). The then-Ningxia TV station (currently Ningxia Radio and TV station) was the most influential TV station among all stations in the autonomous region as a province/autonomous region-level broadcaster, and played an important role in the development of the economy and society in the region. However, because of its aging broadcast center building and equipment that resulted from a lack of funds, the station was unable to improve TV programs, including educational programs, in quality as well as quantity.

Against this background, this project was implemented to improve the quantity and quality of broadcasting in Ningxia Hui Autonomous region to contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in the autonomous region, and also to the promotion of mutual understanding between China and Japan. In addition, the project planned to introduce Japanese broadcasting technology and equipment into China under the Special Terms for Economic Partnership (STEP)[2].

1.2 Project Outline

The objective of this project was to improve the quantity and quality of the TV and radio programs in Ningxia Hui Autonomous Region by updating the broadcasting infrastructure and providing training to the staff of the broadcasting stations, thereby contributing to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in the autonomous region, and also promote mutual understanding between China and Japan.

[2] JICA approved a total of six broadcasting projects under the STEP condition in China at the same time, including the Ningxia Hui Autonomous Region project. The target areas of the other five projects were Jinan City, Qinghai Province, Yunnan Province, Anhui Province, and Jilin Province.

<ODA Loan Project>

Loan Approved Amount/ Disbursed Amount	4,250 million yen / 4,248 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2004 / March 2004
Terms and Conditions	Interest Rate: 0.75% Repayment Period: 40 years (Grace Period): (12 years) Conditions for Procurement: Main Contracts: Tied (Special Terms for Economic Partnership (STEP)) Sub Contracts: General Untied
Borrower / Executing Agency(ies)	Government of the People's Republic of China/ People's Government of Ningxia Hui Autonomous Region
Final Disbursement Date	August 2012
Main Contractor (Over 1 billion yen)	-
Main Consultant (Over 100 million yen)	-
Feasibility Studies, etc.	Feasibility Study by Ningxia Project Consultation Company (June 2003)
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Yusuke Hasegawa, International Development Center of Japan Inc.

2.2 Duration of Evaluation Study

Duration of the Study: August, 2014 – January, 2016

Duration of the Field Study: November 18–28, 2014; January 28–February 3, 2015

3. Results of the Evaluation (Overall Rating: A[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of China

The Government of China has placed an emphasis on television and radio broadcasting as a means of ensuring people's cultured living in its five-year plans from the Tenth Plan (2001–2005) through the Twelfth Plan (2011–2015). These plans aimed for informatization through developing an information infrastructure by constructing a nationwide digital TV broadcasting network, extending the coverage of TV and radio broadcasting, and developing digital broadcasts. The latest five-year

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

plan of the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China (SAPPRFT), namely the Twelfth Plan, sets a target of having 99% or above of the population covered by TV and radio broadcasting by 2015. The Twelfth Five-Year Plan of Ningxia Hui Autonomous Region also aims to accelerate the construction of the next generation of the information infrastructure such as integrated networks of telecommunication, broadcasting, and computers, and to extend TV and radio coverage in rural areas through the "Village to Village Project" in order to promote the delivery of public cultural services in every village and the "Home to Home Project" to connect to every home by direct satellite communication.

Thus, this project was in line with the development plans of China at the national and the autonomous-region levels from the time of appraisal through ex-post evaluation.

3.1.2 Relevance to the Development Needs of China

Ningxia's income per capita in 2012 was 36,394 RMB, which still fell below the national average (38,459 RMB), although the gap had been narrowing. In addition, there was a significant economic gap between urban and rural residents in the autonomous region that was clearly indicated by the fact that the disposable income of urban residents was 3.2 times higher than the net income of rural residents in 2012 (Source: *Ningxia Statistical Yearbook*). The provincial government recognizes the importance of broadcasting as a means of social services to bridge the gap, which is reflected in its development plans.

According to NXTV, the technical level of broadcasting equipment and infrastructure in the station has been improved through this project, making NXTV one of the technically advanced broadcasters in the west part of China. On the other hand, the station is now more aware of the need to improve "soft capacities" such as planning of new programs and gathering of information, in order to make its programs more attractive to the audience.

In addition, NXTV recognizes that Japanese broadcasting technology and products such as recording and editing equipment have been world leaders, and that it is necessary to continually purchase Japanese equipment to update capabilities in the future from the viewpoint of technical continuity.

Thus, this project was in line with the needs of China for enhancing the broadcasting sector and introducing Japanese technology from the time of appraisal through ex-post evaluation. In addition, improvement in capacities of the staff, such as program planning and information gathering, is becoming a central issue for the executing agency.

3.1.3 Relevance to Japan's ODA Policy

Japan's Economic Cooperation Program for China (October 2001) aimed to develop an environment to promote a market economy, to improve livelihoods in order to promote social development in the inland areas, and to enhance economic activities in the private sector.

Medium-Term Strategy for Overseas Economic Cooperation Operations (2002–2005) of JICA

(JBIC at that time), which was the policy of Japanese ODA loans at the time this project was appraised, emphasized the promotion of information technology to reduce the information gap in developing countries. In addition, the Country Assistance Strategy for China (2003) of JICA (JBIC at that time) stressed human resource development, particularly for regional revitalization and interactions, the strengthening of market rules by utilizing Japan's experiences through interactions with Japan's broadcasting stations (for example, through training and co-production of programs), and environmental conservation.

Thus, the orientation of these policies was consistent with the project, which aimed to improve the livelihood and promote social and economic development by enhancing broadcasting in the inland areas of China.

This project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project outputs can be divided into three categories: a "hard" component that is mainly related to equipment and facilities, a "soft" component that includes training and other activities, and consulting services. The planned and actual project outputs are explained as follows:

Table 1 Project Outputs ("Hard" Component)

	Plan		Change	Reason
NXTV	Ningxia TV Station	・Construction of broadcast center (total floor area: 32,300 m^2)	・It was undertaken with the Chinese fund.	・Chinese government policy made it impossible for Japanese construction firms to serve as the prime contractor as required by STEP.
		・Studio equipment (digital cameras/recorders, satellite program receivers, monitors, lighting, etc.)	・Some of the equipment and facilities were upgraded. (e.g., studio equipment and nonlinear editing network were changed to the HDTV system.) ・Expansion of nonlinear production and editing systems (news system, production and recording systems were added.) ・Expansion of signal	・To meet financing needs created because broadcast center was financed by the Chinese fund. ・To respond to advances in technology ・To respond to an expanded scope of business and to improve the efficiency of the entire operation at the

	Plan		Change	Reason
			receiver and transmission system (fiber-optic and microwave transmitter, satellite signal receiver, and monitoring system were added.) ・Effective lighting equipment (1,200 m^2) as added.	station. ・To improve efficiency and effectiveness of using the planned equipment.
		・Broadcasting van	・Three TV vans including an HDTV van were procured. (Only one Standard Definition TV van was originally planned.)	・Higher-grade equipment and system were introduced in response to advances in technology. ・To respond to an expanded scope of business of the station.
	(none)		・Radio broadcasting system was added. (production system, live broadcasting system, recording equipment, radio broadcasting van, etc.)	・To respond to the needs for equipment and facilities caused by the integration of Ningxia TV Station with Ningxia Radio Station.
	(none)		・Electric machine equipment (3 elevators, power generator)	・To increase operational efficiency by maintaining the entire broadcast center.

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency

(1) "Hard" Component (procurement of broadcasting equipment and facilities)

The planned outputs were changed during the implementation in two respects. First, the civil work for construction of NXTV's broadcast center that was planned to be conducted by the JICA fund was cancelled and transferred to the Chinese fund. Second, in connection with the first change, the scope of equipment and facilities purchased was expanded. There were sufficient reasons identified for these changes, and they are recognized as relevant in the light of the project objective. The details are as follows:

1) Exclusion of Broadcast Center Construction from the JICA Fund

This Japanese ODA loan project originally planned to include the civil work for constructing NXTV's new broadcast center. After the start of the project, the executing agency selected a Japanese construction firm as the main contractor for the civil work according to the STEP rule

on nationality requirements. However, during the process of contract negotiations with the firm, an issue came up about a contradiction regarding nationality requirements between the STEP rule and Chinese government policy. The policy on foreign-invested construction enterprises that was issued after the project started made it impossible for Japanese construction firms to serve as the prime contractor as required by the STEP condition of the project. As a result, the civil work portion was cancelled and transferred to the Chinese fund.

The problem arose because of a notice issued by the Chinese Ministry of Construction (at that time) in September 2004. The notice stipulated that the Ministry had ceased to accept applications from foreign-invested construction firms for initial registration or extension of registration as eligible entities. On the other hand, according to the documents provided by JICA, the legal opinions issued by the Chinese Ministry of Foreign Affairs that were a precondition for the commencement of the loan agreement had stated that there was no contradiction with domestic laws. After the Ministry of Construction issued its notice, the Chinese Ministry of Finance denied the application of the STEP condition to the civil work for this project. Based on the above, it is considered that it was difficult to foresee the problem at the time of appraisal. According to the executing agency, although they consulted with the Ministry of Finance and Ministry of Construction many times, the original plan had to be changed in the end. The broadcast center was duly completed by the Chinese fund.

2) Expansion of the Scope of Equipment and Facilities Procured

Regarding TV equipment and facilities such as studio equipment, network systems, and broadcasting vans, the main contents of those procured were largely the same as planned, while there were some modifications to the number of pieces and specifications of certain equipment in response to advances in technology during the implementation. In addition, equipment for the radio broadcasting system and electric machine equipment such as elevators were added to the project. Many of these alterations were made to utilize the JICA fund that became available as a result of the exclusion of the civil work from the JICA fund as stated above. The exclusion triggered NXTV's financing needs for the equipment and facilities that the station originally intended to procure on its own instead of undertaking the civil work. In addition, according to interviews with the concerned parties and an analysis of the related documents, NXTV felt that there were more important needs at that time.

(i) There was a growing need for radio equipment and facilities caused by the organizational integration between the Ningxia TV Station and the Ningxia Radio Station in 2005.
(ii) Upgrading and adjustment of the number of pieces of certain equipment were increasingly needed in response to technological advances such as HDTV technology.
(iii) At the start of full-scale operation of the new broadcast center, the equipment and system to improve the entire operational efficiency and effectiveness of the station were needed.

In consideration of the project objective, which is to improve broadcasting, the outputs added to

the original plan were considered as relevant and met the needs of NXTV at the time.

(2) “Soft” Component (training for the staff of the broadcasting station and other activities)

For the “soft” component, the project plan included training for the staff of the Chinese broadcasting station, co-production of programs and other collaborations between the Chinese and Japanese broadcasting stations, the purchasing of programs produced in Japan, and so on. In reality, training and program co-production were implemented with some modifications to the plan, and the changes are recognized as justifiable. On the other hand, collaboration between the Chinese and Japanese broadcasting stations and purchasing of Japanese-made programs were not realized. The details are explained below.

- Although the training was provided to the same number of NXTV staff members as planned, the training period was substantially shortened for each course, resulting in the reduction in total person-months (16 person-months planned and 3.5 person-months implemented). The change was made based on NXTV’s operational decision that it would be difficult for its main technical staff to be away from work for a long time as project implementation was ongoing. However, still focusing on technical training as planned, the training contents were carefully designed to generate sufficient results. The training program focused on production and transmission technology of HDTV programs, the issues of program design and creation using documentary programs in Japan as an example, and the current trend and future challenges of state-of-the-art broadcast technology. As a result, NXTV (including the training participants who were interviewed) recognizes that there was no shortage of technical learning during the training for that period. Thus, the training program was judged to be appropriately implemented even after the change in period.
- Co-production of programs between Chinese and Japanese broadcasting stations was not realized. Instead, NXTV, in cooperation with a Japanese production company, made two 20-minute TV programs. The theme of the both programs was Japanese ODA loan assistance (one an afforestation project and the other a human-resource development project) underway in Ningxia at that time. Each program was broadcast by NXTV Economy Channel twice in May 2010.
- According to NXTV, the principal reason for not succeeding in program purchasing was restrictions on importing and broadcasting foreign TV programs. These restrictions were implemented by SAPPRFT, which supervises the Autonomous Region’s Administration of Press, Publication, Radio, Film and Television Bureau, and NXTV. In addition, NXTV pointed out other reasons, including the high costs of the programs and a lack of capacity to re-edit the program for broadcasting in China.
- According to the consultant to this project, collaboration between the broadcasting stations and program co-production were not realized because Japanese broadcasting stations contacted by the consultant were unable to agree on a planning policy with the Chinese side,

and were limited in resources such as staffing and funding. As stated above, restrictive policies of the Chinese government regarding the broadcast of foreign TV programs also hindered the ability to collaborate or co-produce.

Table 2 Project Outputs ("Soft" Component)

	Plan		Change	Reason
NXTV	Ningxia TV Station	・Training (editing technique: 2 months × 4 staff; transmission: 2 months × 4 staff): total 480 person-days ・Collaboration with Broadcasting System of San-in (BSS) and NHK ・Purchase of programs/broadcasting rights of programs produced in Japan ・Co-production of programs with Japanese broadcasting stations	・Training period was shortened (editing technique: 7 days × 2 staff; transmission: 15 days × 6 staff): total 104 person-days ・Co-produced TV programs titled "Common Wish" and "Future" with a Japanese production company ・Collaboration with Japanese broadcasting stations and purchase of programs/broadcasting rights of programs produced in Japan were not implemented.	・NXTV requested their main technical staff to be away from work for a shorter period for operational reasons. ・The main reasons for not implementing program purchasing were restrictions of the government on importing/broadcasting foreign programs, the high cost of purchasing programs, and related expenses such as translation. ・For the Japanese broadcasting stations, the main reasons for not implementing collaboration and program co-production with NXTV were their different planning policies and limitations in resources such as staffing and funding.

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency

(3) Consulting Services

Part of the consultant's work was changed in accordance with a change in the procurement method for equipment and facilities in March 2007, owing to a significant delay in the procurement process caused by the slowed inception of civil work. At the time of the change in procurement method, three years had passed since the signing of the loan agreement, and procurement needed to begin promptly. According to the document prepared by JICA, the estimated cost of each package was below a specified allowable level, and post-qualification reviews were conducted instead of pre-qualification (P/Q) to ensure the quality of contractors. Thus, the change in procurement method was considered to be relevant for the purpose of speeding up the procedure.

Table 3　Project Outputs (Consulting Services)

Plan	Change	Reason
(Support in procurement) ・Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ・Evaluation of P/Q results ・Preparation of tender documents ・Evaluation of tender results (Support for training and others) ・Training in Japan ・Co-production of programs with Japanese broadcasting stations ・Purchase of Japanese programs and broadcasting rights	・Preparation of P/Q documents and evaluation of P/Q results were removed. Instead, support for post-qualification (document preparation and evaluation) was conducted.	・Procurement method of equipment and facilities was changed from International Competitive Bidding (ICB) with P/Q to ICB with post-qualification.

Source: Documents provided by JICA; interview with Executing Agency

TV Control Room

Broadcasting Network Server

(4) STEP's Effects on Outputs

The Customer Satisfaction Survey for the STEP Loan, which was conducted with the executing agency, reveals that the executing agency is highly satisfied with the content and technical level of the procured equipment and facilities. On the other hand, the executing agency also expressed its view that the STEP rules limiting the prime contractor to Japanese firms and specifying a minimum procurement share of Japanese products constrained the number of bidders and hindered the price competition to some extent.

As stated above, the original plan for the project included civil work to construct a new broadcast center for NXTV. This was to be undertaken by the JICA fund. However, the civil work part was transferred to the Chinese fund because of the Chinese government's policy on foreign-invested construction enterprises that was issued after the project started. The revised policy made it impossible for Japanese construction firms to serve as the prime contractor as required by the STEP condition of the project. As a result, new procurement packages for equipment and facilities were

added to the implementation plan of this project, and the structure of outputs for the hard component was changed significantly from the combination of civil work and equipment and facilities to equipment and facilities in all packages.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The estimated project cost at appraisal was 5,266 million yen in total, out of which the Japanese ODA loan was to be used for the foreign currency portion amounting to 4,250 million yen. The remaining 1,016 million yen was to be funded by the Chinese side for the local currency portion. The actual cost of the project was 7,625 million yen, which exceeded the planned amount (145% of the plan). The principal reason was that construction of broadcast center was excluded from the JICA fund and transferred to the Chinese fund, and that the corresponding ODA loan amount was used for additional purchases of equipment and facilities. Because the cost of broadcast center construction was still included in the calculation of the project cost, the total project cost increased according to the expanded scope of equipment and facilities that were additionally purchased.

The actual amount disbursed from the Japanese ODA loan was 4,248 million yen, which corresponded to 100% of the planned amount.

Table 4 Project Cost (Unit: million yen)

	Plan				Actual			
	FC(*2)	LC(*2)	Total		FC	LC	Total	
	JICA fund	Non-JICA fund	Total	JICA fund	JICA fund	Non-JICA fund	Total	JICA fund
Construction of broadcast center	2,403	795	3,198	2,403	0	3,141	3,141	0
Broadcasting equipment	1,357	0	1,357	1,357	4,177	235	4,413	4,177
Training	94	0	94	94	(*4)	0	(*4)	(*4)
Price escalation (*3)	163	0	163	163	-	-	-	-
Contingency	201	164	365	201	-	-	-	-
Consulting services	32	0	32	32	70	0	70	70
Interest during construction	0	57	57	0	-	-	-	-
Total	4,250	1,016	5,266	4,250	4,248	3,376	7,625	4,248

Source: Documents provided by JICA and Executing Agency; interview with Executing Agency
Exchange rate: 1 RMB = 14.3 yen at appraisal;
1 RMB = 13.9 yen at ex-post evaluation (average from 2004 to 2013)
Note: (*1) Money amount was rounded down to one million yen.
(*2) FC: Foreign currency; LC: Local currency
(*3) Contingency fund to cover cost rises caused by price increases
(*4) The cost of training is included in that of consulting services

The procurement in this project was originally planned to be implemented in two packages: "TV station equipment" and "civil work." The packaging was changed three times, as shown below.

1) The "TV station equipment" package was divided into six packages in March 2007.
2) The "Civil work" package was replaced by seven new packages of equipment and facilities in October 2007.
3) A portion of the items in the 10th package was separated in March 2008 as the 14th package.

The purpose of the first change was to encourage more bidders to participate and to make the bidding process smoother by dividing the equipment and facilities into smaller packages based on their types and functions. The second change was made to purchase additional equipment and facilities. The third change was intended to purchase a TV relay vehicle ahead of the other items in order to utilize it for airing the Beijing Olympic Games.

The equipment and facilities procured in a total of eight additional packages accounted for approximately 63% of all the equipment and facilities procured in terms of contract amount (i.e., 2,610 million yen out of 4,170 million yen). The large amount of cost input is considered to have reflected on the fact that the additional equipment and facilities were, for the most part, critically important to a broad range of users in the station, and that the equipment and facilities were technically advanced. For example, highly important systems that play a pivotal role in the overall operations in the station, such as a nonlinear editing network and equipment of high-level specifications were included in response to the need for a sophisticated technology such as an HDTV broadcasting system. Looking at the costs of the individual packages, the eighth package (including a nonlinear production and editing network) and the 10th and 14th packages (including broadcasting vans), which consisted of a major part of the overall package of additional equipment and facilities in terms of value, were not recognized as excessive expenses because there was no substantial difference observed in the contract amount between the major equipment in the above additional packages and the same type of equipment in the packages that were originally planned. Furthermore, based on interviews and observations at NXTV, no equipment and facilities were found to be used at considerably low frequencies. As a whole, the project cost was considered to meet the actual outputs.

Table 5 Procurement Packages (Unit: million yen)

Package	Plan at appraisal	Revised plan in March 2008	Actual	
	Total	Total	Total	(Reference) Japanese-product ratio (%)
1. TV Equipment	1,357	-	-	-
2. Civil Works	2,403	-	-	-
1. 10-Channel Digital SD TV OB Van, DSNG Communication Vehicle, Mobile Microwave Transmission Equipment	-	431	375	59
2. 150 m^2 Studio Video Equipment, 400 m^2 Studio Video Equipment	-	233	344	62
3. Center Control System, Playing System, Transmission System	-	181	198	15
4. TV Studio and OB Van Audio System, Intercom System	-	106	117	10
5. Lighting (150-m^2 Studio, 400-m^2 Studio, 1200-m^2 Studio)	-	293	303	3
6. Nonlinear Editing Network, Receiving and Recording System, Virtual Studio	-	129	223	8
7. Special Machinery and Power-generating Equipment	-	128	94	55
8. Business Platform of Nonlinear Program and Network System	-	833	783	26
9. Radio Broadcast System	-	368	452	10
10. HD OB Van, Recording Van System	-	625	578	58
11. Monitoring and Control System of Broadcast, Recording Equipment	-	124	247	99
12. Signal Receiving and Transmitting System		112	219	13
13. Effective Light, Stage, Seat and LED Screen System of 1200-m^2 Studio		209	149	1
14. Microwave Television Relay Vehicle for the News		86	88	5
Total	3,760	3,865	4,173	34

Source: Documents provided by JICA
Note: Money amount was rounded down to one million yen. Percentage was rounded to the unit.

3.2.2.2 Project Period

The project period[5] was significantly longer than planned. While the planned period at appraisal was 52 months, the actual period was 111 months, which was 213% of the planned period. The main reason for this was a delay in the commencement and implementation of constructing the broadcast center. This had a great influence on the timing of the start and the progress of consulting services, procurement of equipment and facilities, and training.

[5] The completion of the project was defined as the completion of all components, i.e., construction of the broadcast center, equipment and facilities, training, and consulting services. The completion of construction was defined as the date of inspection approval by the Ningxia Department of Construction, completion of equipment and facilities was the date of delivery when completed by the contractor, and completion of training was the date when Chinese trainees returned to the country (documents provided by JICA). The completion of consulting services was defined by the evaluator as the final day of the consultant's work.

As stated above, the exclusion of civil work from the Japanese ODA loan was decided during the process of contract negotiation with a Japanese firm. This caused the executing agency to restart the procedure to select a construction company with Chinese nationality. According to NXTV, the progress of civil work had been slowed by more than two years than planned at that time. Moreover, after construction began, the timing for procuring equipment and facilities had to be adjusted to the progress of the civil work. On the other hand, part of the civil work, such as interior finish work, was delayed owing to some procurement packages that required rebidding because no bidders were technically qualified.

Table 6 Project Period

	Planned	Actual
Entire Project	March 2004 (L/A signed)–June 2008 (52 months)	March 2004–May 2013 (111 months) (213% of the plan)
a) Construction of broadcast center	April 2003–December 2007	March 2007–May 2013
b) Procurement of Equipment	July 2005–June 2008	November 2007–July 2012
c) Training	October 2004–December 2005	(Training) December 2008 (Co-production) April 2009–February 2012
d) Consulting Services	April 2004–March 2007	August 2005–February 2012

Source: Documents provided by JICA; interview with Executing Agency

3.2.3 Results of Calculations of Internal Rates of Return (Reference Only)

This project was designed to cover a broad range of effects such as the provision of broadcasting equipment, training, mutual understanding between China and Japan through co-production and procurement of programs, and raising awareness of environment, hygiene, and market rules. Since these effects cannot be measured quantitatively and comprehensively, it was not possible to calculate the internal rate of return at appraisal and at ex-post evaluation.

To sum, the project cost exceeded the plan, and the project period significantly exceeded the plan. It should be noted, however, that the additional cost properly met an expanded scope of the project based on the revised implementation plan that was developed during the project implementation.

Based on the above, the project cost matched the outputs while it exceeded the plan, and the project period significantly exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[6] (Rating: ③)

Effectiveness was analyzed from both aspects of the quantitative effects, including operation and effect indicators (broadcast coverage, number of viewers, etc.) defined at the time of appraisal and the

[6] Sub-rating for Effectiveness is to be put with consideration of Impact.

qualitative effects concerning the improvement of the quality of broadcasting.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

Although the verification of quantitative effects is to be conducted by comparing the actual performance and the target values set for one year (or two years for some indicators) after project completion as defined at the time of appraisal, it was not possible at the time of the ex-post evaluation to obtain the data showing the actual performance achieved one year after project completion, which was marked by the completion of the broadcast center in 2013. However, because the delivery of equipment for this project was completed in 2012, we conducted a verification that compared the newest available data from 2013 and the target values.

As shown in Table 7, as basic operation and effect indicators, broadcast coverage and the number of TV viewers in Ningxia Hui Autonomous Region both greatly exceeded the target values. Broadcast coverage reached 99% (vs. the target value of 89%), and the number of TV viewers grew to 1.80 million households (vs. the target value of 1.75 million households). However, these effects are considered to reflect the direct contribution of the expansion of the transmission network infrastructure and the policy of the Chinese government to promote access to broadcasting in rural areas. This project, which aimed at improving the stage of program production such as information gathering and editing, is considered to have made only an indirect contribution. On the other hand, target values have also been reached for the indicators that are more directly related to program production, such as the number of education programs, broadcasting hours per day of education programs, and share of independently produced programs. These are also included in operation and effect indicators listed in the documents provided by JICA.

Although this project did not include a provision for improving the broadcasting facilities and equipment at Ningxia Educational TV Station, the description of expected quantitative effects included those concerning Ningxia Educational TV Station. This is because a merger between Ningxia Educational TV Station and Ningxia TV Station was foreseen at the time of appraisal, and the educational station planned to use the TV station building constructed in this project. However, at the time of the ex-post evaluation, this merger has not taken place, and there is no direct operational relationship between the educational TV station under the direct management of the Autonomous Region's Department of Education and NXTV, which belongs to a division of the administration of Press, Publication, Radio, and Film and Television. Therefore, this evaluation does not include the indicators concerning Ningxia Educational TV Station that were described at the time of appraisal.

Table 7 Operation and Effect Indicators

Indicator	T/E (*1)	Baseline	Target	Actual		
		2003	2008	2008	2012	2013
		Baseline Year	1 Year After Completion			(Latest Year)
Broadcast Coverage in Ningxia (%)	T	87.7	89.3	96.78	98.90	99.09
TV Viewers in Ningxia (10,000 households)	T	165.3	174.6	n.a.	n.a.	180.1
Number of education programs (programs/year)	T	2	3 (*2)	3	4	4
	E	7	9 (*2)	-	-	-
Broadcasting hours per day of education programs (hours/day)	T	0.75	1.25 (*2)	1.25	1.5	1.5
	E	3.00	4.50 (*2)	-	-	-
% Share of independently produced programs (%)	T	20	35 (*2)	35	35	35
	E	10	20 (*2)	-	-	-

Source: Documents provided by JICA and Executing Agency; *Statistical Yearbook of China*
(*1) T: Ningxia TV Station; E: Ningxia Educational TV Station
(*2) It is indicated in the JICA document that these are the target figures for 2008 and "two years after completion."

In addition, among the quantitative indicators listed for reference purposes other than the operation and effect indicators, 11 of the 13 items achieved their target values in 2013. In particular, the number of TV channels increased to five after the launch of the children's channel in 2006, and the number of programs for children also increased. The number of independently produced programs also increased dramatically. Because the equipment for production and editing and the key components of the internal operation system at the new broadcast center were procured in this project, it is considered that this project contributed greatly to the attainment of these quantitative results.

The only parameter that failed to reach the target value was the number of programs produced in other countries including Japan. This figure decreased considerably in comparison with the baseline, particularly in recent years. The reasons for this decrease mentioned by NXTV include 1) the limitations imposed by higher administrative bodies of China on the number of imported programs aired, and 2) the recent rapid hike in the prices of Chinese programs purchased in various genres, which drained funds for the purchase of foreign-made programs. As for the programs produced in Japan, it has been pointed out that these programs are losing acceptance among TV viewers. This reflects the recent aggravation in the international relationship between the two countries, in addition to the above reasons.

According to the documents provided by JICA and interviews with relevant persons, there was an attempt to promote the purchase and airing of Japanese programs among the executing agency, Japan Foundation, and JICA, where JICA would add Chinese subtitles to the Japanese-language programs produced by the Japan Foundation and offer them at no cost to the executing agency. Although this idea was discussed beginning around 2008, it was not realized because approval was not obtained

from the higher authority in China.

Table 8 Other Indicators

Indicator	T/E (*)	Baseline	Target	Actual		
		2003	2008	2008	2012	2013
		Baseline Year	1 Year After Completion			(Latest Year)
Number of independently produced programs (programs/year)	T	17	21	22	29	29
	E	5	7	-	-	-
Number of channels (channels)	T	4	5	5	5	5
	E	1	1	-	-	-
Broadcasting hours per week (hours/week)	T	512	588	588	700	700
	E	105	120	-	-	-
Number of programs/ broadcasting times of programs related to disaster (T: programs/year; E: times/year)	T	0	1	2	3	3
	E	26	52	-	-	-
Number of programs related to environmental conservation (programs/year)	T	8	9	9	9	10
	E	1	1	-	-	-
Number of programs related to public health (programs/year)	T	7	7	7	7	7
	E	2	2	-	-	-
Number of programs related to the development of market economy (programs/year)	T	7	8	8	8	8
	E	2	2	-	-	-
Number of programs produced in other countries (programs/year)	T	169.5	204	120	40	40
	E	0	2	-	-	-
Number of programs produced in Japan (programs/year)	T	39.8	43.5	20	0	1
	E	7.7	19.6	-	-	-
Number of programs/ broadcasting times of programs targeting ethnic minority groups (T: programs/year; E: times/year)	T	3	4	4	4	4
	E	0	52	-	-	-
Number of programs/ broadcasting times of programs targeting women (T: programs/year; E: times/year)	T	2	3	3	3	3
	E	52	52	-	-	-
Number of programs targeting children (programs/year)	T	1	1	3	4	4
	E	3	3	-	-	-

Source: Documents provided by JICA and Executing Agency; *Statistical Yearbook of China*
(*) T: Ningxia TV Station; E: Ningxia Educational TV Station

3.3.2 Qualitative Effects (Other Effects)

The use of the facilities and equipment procured in this project at NXTV is considered to have improved the quality of broadcast in various aspects such as the efficiency of program production, production and broadcast techniques, directing and broadcasting methods, and efficiency of work at

the broadcasting station. These qualitative improvements support quantitative expansion such as the increases in broadcast hours and the number of programs. In concrete terms, the following qualitative effects are observed:

- Complete transition from analog to digital formats in production and airing was realized. For example, the children's channel that launched in 2006 was initially an analog broadcast channel, but was switched to digital using the equipment in this project. The switch to digital shortened the time needed for program production, and reduced production cost.
- HDTV transition of newsgathering, recording, and production equipment was realized. This greatly improved technical quality and helped enrich content such as high-picture-quality programs.
- With regard to program direction and effects, newly introduced equipment enabled the live broadcasting of news shows, which previously were entirely prerecorded. A large outside broadcasting van, satellite truck, and other equipment were used for the live coverage of major events and sports meetings, such as the torch relay during the 2008 Beijing Olympic Games, the Ningxia Yellow River Gold Coast International Marathon, Ningxia Spring Festival Gala, and the China-Arab States Expo.
- The commissioning of a stationwide operations network remarkably improved the efficiency of program production and airing. The establishment of a network that covered the entire broadcasting station provided connectivity among the production and broadcasting subsystems, which previously were incapable of mutual conversion, and realized a unified digital system. This organized the entire workflow in the form of document files, facilitating information exchange and realizing a broadcasting system that used no tapes (VTR).
- The appreciation from governmental bodies in the country concerning the programs produced by NXTV has generally been improving. There is an increasing trend in the number of state, province (autonomous region), and department-level awards won by the station, which totaled 151 programs in 2013. From 2008 to 2014, the station received four Golden Sail Awards (for TV programs) and 11 Golden Deer Awards (for radio programs), which the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China presents every year to commend programs of high technical quality.
- The answers from the beneficiary survey[7] also confirmed the qualitative and quantitative improvement of the programs of NXTV. The survey results indicated that the station's TV programs concerning education, culture, and living information improved in comparison with 5 to 10 years ago in the following aspects, in decreasing order of the appreciation of TV viewers: (i) provision of more local information; (ii) an increase in the number of programs; (iii) provision of more easily understood programs, and (iv) timely availability of information. Radio programs

[7] The beneficiary survey was conducted in December 2014 in Yinchuan City, Wuzhong City, and Guyuan City, using questionnaires administered by researchers. Effective answers were obtained from 100 people in total (51 males and 49 females). The questionnaire mainly consisted of questions regarding TV and radio viewing and listening behavior, evaluation of NXTV programs, and knowledge and interest in foreign countries (U.S., Korea, and Japan) via broadcasting.

were also highly evaluated by listeners in the following aspects, in decreasing order: (i) provision of more local information; (ii) an increase in the number of programs; (iii) provision of more easily understood programs, and (iv) better reflection of the listeners' needs.

However, according to NXTV, the average audience share for the station in Ningxia Hui Autonomous Region as a total of all channels dropped from 3.78% in 2005 to 2.15% in 2014 (at the time of the ex-post evaluation). This is considered to reflect the increasing competition with satellite channels in other provinces, as well as the loss in popularity of television in general owing to the expansion of media other than TV. Although the station asserts that some programs are popular among viewers, the effect of the improvement of quality in the production stage has not resulted in an increase in the audience share as a whole. This view concurs with the station's understanding that, once it has achieved the introduction of advanced equipment and improvement of technical expertise, it urgently needs to develop the ability to produce attractive content.

Column "My Experience in the Upgrading of Broadcasting Equipment"

Mr. Liu Junkai, Recording and Production Department, Ningxia Radio and TV Station Technology Center

I am in charge of the Recording and Production Department, which includes operation, maintenance, and servicing of studios, outside broadcasting (OB) vans, and lighting system equipment. I have been working with NXTV as an engineer since 1996. When the station underwent a major upgrade to its broadcasting equipment and facilities under a Japanese ODA loan project, some of the young and middle-level workers in the station were appointed to take charge of equipment management in 2008, and among others, I was chosen to work in the Recording and Production Department. Starting from the time of the trial operation of the 1,200-m^2 studio, completed in the same year and continuing after the beginning of its full operation, I learned studio operation and production techniques through training and instruction given by the manufacturers for two years. Formerly, when we wanted to record a large event, we had to do it outdoors or borrow a third-party facility such as a gym. The completion of this large studio on the premises of the station greatly improved the efficiency and cost of production.

The introduction of the outside broadcasting van under the Japanese ODA loan project also completely changed broadcasting practices at NXTV. As we formerly had only one analog recording van, we sometimes needed to borrow OB vans from broadcasting stations in other cities or other

provinces when we needed to perform digital broadcasting. I used the newly introduced digital OB van for the first time for the coverage of the mid-autumn festival in October 2008, when I had just completed a two-month training period. Because we were not prepared sufficiently at the time, the program was recorded rather than live coverage. However, the use of the OB van enabled us to perform editing work such as subtitling and dubbing on the spot, and we were able to air the program on the next day. This represented a tremendous improvement in efficiency, as we used to require one week for the editing and production work on recorded video and audio materials.

Now, the OB van and satellite truck provided in this project are used on various occasions such as seasonal events, political events, and sports tournaments. For example, the National Traditional Ethnic Minority Sports Meet held in 2012 in Ningxia was covered on the spot by NXTV, and the signals were sent to Chinese Central Television (CCTV) for real-time live broadcasting all over the country. In many events, such as the Yellow River Gold Coast International Marathon held biannually in Ningxia, we use the microwave relay van, the TV broadcasting van, and the satellite truck in an integrated system to deliver a realistic experience and to ensure the security of broadcasting by using a combination of different transmission routes. In terms of production capabilities, we can now perform slow-motion replay in the OB van, for example. This improved the quality of live sports programs. Since we have this well-equipped setup for outside broadcasting, we now occasionally lend the OB van to stations in other provinces.

(Retold by the evaluator based on an interview.)

Satellite Truck

150-m^2 TV Studio

3.4 Impacts

3.4.1 Intended Impacts

(1) Advancement of Education, Cultural Enrichment, and Knowledge Enhancement for Ningxia Citizens

NXTV recognizes that TV viewers want educational and cultural programs made to a higher standard both in terms of the depth and expanse of the treatment of subjects and the level of production techniques. The viewers' opinions are a result of changes in the last 10 years, such as

the rapid development of media technologies, the increase in the variety of communication media, and the popularization of social networks and other means for information exchange. In response, the station has been increasing its production of high-quality documentary shows and splendid artistic programs that combine filming, music, voice dubbing, literature, and other elements. The satellite channel of NXTV produced and nationally aired high-quality programs featuring the nature and society of Ningxia, such as "Impressions of Ningxia" and "Here is Ningxia," which were favorably received by the public. NXTV also recognizes the rapid diversification of the ways that young people get information as a result of the spread of new media, and in response, the station has produced lifestyle and informational TV and radio programs linked to the Internet and social networks. In addition, the public channel of NXTV is sponsoring campaigns and various awareness activities about activities such as free health checkups for citizens in cooperation with local healthcare professionals.

Apart from that, our beneficiary survey ascertained that the TV and radio programs of NXTV are used effectively in citizens' daily lives. For example, TV programs such as "The Shining City" and "The Story of Wealth" are highly regarded as very useful sources of information and knowledge directly related to daily living. People are also making good use of radio programs at work and in daily life, such as listening to "Traffic Radio" to get timely information of road conditions.

As described above, NXTV is responding to the needs of citizens and promoting knowledge and awareness by providing high-quality programs concerning culture, education, social, and lifestyle information, and by conducting various campaigns. Citizens are using the lifestyle and informational programs of NXTV to improve their knowledge and to obtain useful information. We therefore conclude that the project has been making beneficial impacts on the advancement of education, cultural enrichment, and knowledge enhancement of people in the autonomous region.

(2) Promotion of Mutual Understanding between Japan and China

As discussed above, the TV programs "Common Wish" and "Future," which were produced jointly with a Japanese production company, were each aired twice on the economy channel of NXTV in May 2010. These programs featured the activities in Japanese ODA loan projects (an afforestation project and a human resource development project) conducted in Ningxia Hui Autonomous Region. Because these programs did not simply introduce Japan but pursued the theme of cooperation between the two countries, they were considered to be in line with the goal of mutual understanding. However, we could not obtain information concerning concrete responses from viewers. The NXTV employees involved in the production of these programs, nevertheless, stated that they were very impressed by the meticulous preparation and material-gathering procedures performed by the staff from the Japanese production, and that experience was helpful to them in improving their work. The engineers who attended the training in Japan commented that they were impressed by the very earnest attitude of the workers at the Japanese broadcasting station they visited.

We also conducted a beneficiary survey to find out how the media changed the people's impressions of and interest in Japan. The answers concerning changes in the impression of Japan as seen in TV programs in comparison with 5 to 10 years ago were "no change" for 46% of responders, "became better" for 13%, and "became worse" for 27%. When the same question was asked concerning the impression of the United States and that of Korea, more people answered "no change" and "became better" (50% and 24% for the US, and 54% and 29% for Korea) as compared with the question about Japan, and fewer people answered "became worse" (12% and 6%, respectively). However, this question was not targeted at a particular broadcasting station, because NXTV aired only a very limited number of programs produced in Japan during the past five years.

Because two jointly produced programs were aired and the content of these programs was in line with the goal of mutual understanding between Japan and China, we can consider that the program was effective to a certain extent in promoting understanding among the viewers of these programs. However, because the purchase and airing of programs concerning Japan have been extremely limited, it is difficult to say whether this project had a positive impact on deepening the understanding of Japan among citizens in general. On the other hand, some of the NXTV personnel who were directly involved in this project deepened their understanding of the Japanese people and the work attitude of Japanese companies through interaction with the Japanese people.

(3) Strengthening of Collaboration between Japanese and Chinese Broadcasting Stations

There were no identified cases of collaboration between NXTV and Japanese broadcasting stations being strengthened through this project. Although Ningxia TV Station, which was the predecessor of NXTV, entered a cooperation agreement with Broadcasting System of San-in (BSS) in 1994, no concrete cooperation activities are ongoing at present.

3.4.2 Other Impacts

Other positive impacts include the fact that the advertising revenue of NXTV has been showing an increasing trend (Table 9). As to the factors behind this change, the station mentioned an increase in the number of channels during and after 2006, an increase in the number and airing hours of independently produced programs, and the improvement of audio and visual effects realized by the use of new equipment mainly provided by this project.

No impact on the natural environment arising from this project has been identified. This project did not involve the acquisition of new land or relocation of inhabitants.

As discussed above, target values were attained for the majority of quantitative indicators defined for the purpose of verifying the effects of this project. Qualitative indicators also confirmed an improvement in the quality of programs through the improvement of various program production technology and methods. Although some of the planned impacts were missing or limited, it was found that programs responding to the needs of society were produced and utilized in the people's daily

lives.

Based on the above, this project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

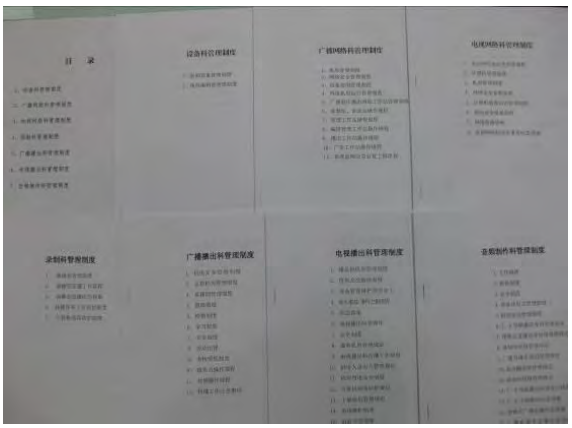
3.5.1 Institutional Aspects of Operation and Maintenance

In 2005, Ningxia Administration of Press, Publication, Radio, Film and Television, and NXTV became organizations that were ranked equally on the agency/bureau level, and the organization in charge of this project was changed from the Ningxia Administration to NXTV. In the new system, NXTV operates and maintains the facilities and equipment procured in this project under the supervision of the Finance Department of the Autonomous Region. A system for the operation and maintenance of facilities and equipment has been maintained at the station up to the present.

The main department in charge of the operation and maintenance of broadcasting facilities and equipment within NXTV is the Technology Center. The Technology Center is staffed with approximately 150 workers and is composed of a Facility Section, Radio Network Section, TV Network Section, Recording Section, Radio Broadcast Section, TV Broadcast Section, and Audio Production Section. Apart from the Technology Center, the Transmission Center takes charge of the operation and maintenance of transmission facilities, and the Logistics Support Service Center handles the operation and maintenance of power supply facilities. There is a well-established system for the management of equipment and facilities according to their types and functions, and the station is considered to have an appropriate maintenance system.

3.5.2 Technical Aspects of Operation and Maintenance

NXTV has approximately 80 (including approximately 30 at the Technology Center) senior- and higher-level engineers (high-level engineers and professor-level engineers). There are approximately 160 entry-level and middle-level engineers (including approximately 40 at the Technology Center). Considering the situation of technology at the new broadcast center, the station introduced a new set of rules concerning facility operation, maintenance, and use management to the sections in the station. In addition, the Technology Center originally produced use management handbooks for technical facilities that were tailored to program production personnel (operational techniques) and technical maintenance personnel (repair techniques) for use in internal training and education. During the implementation of this project, a total of 40 workers were trained overseas, and a total of more than 580 workers were trained in the country, consolidating the foundation for the operation and maintenance of equipment and facilities. According to NXTV, the station has a high employee retention rate, and the workers who received domestic and overseas training remained employed at the station at the time of ex-post evaluation, indicating that the station is successfully retaining the operation and maintenance know-how it acquired. From the above, it is considered that the presence of sufficient operation and maintenance technology in the organization is ensured.



Facility and Equipment Management Manuals Developed by NXTV

Delivered Japanese-made Camera Equipment

3.5.3 Financial Aspects of Operation and Maintenance

The total revenue of NXTV has been increasing for the past five years, and the share of government subsidies in the revenue is approximately 20–30% of the total. On the other hand, maintenance expenditures are within several percent of the total expenditure amount, although there are fluctuations from year to year. Capital investment such as facility renewal is also less than 10% of annual revenue (Table 9). Now that the equipment and facilities were all delivered in this project, the station plans an outlay of more than 13 million RMB per year in maintenance costs to ensure the normal operation of these facilities and for training engineers (source: Project Completion Report, 2013). This plan is fairly affordable considering the size of the station's income. In addition, there is no plan for a major renewal of equipment and facilities in the near future. Therefore, it is considered that the financial sustainability of operation and maintenance is guaranteed.

Table 9 Financial Revenue and Expenditures of NXTV

(Unit: million yuan)

Item	2009	2010	2011	2012	2013
Total annual revenue	188.04	255.87	294.25	346.14	336.12
Business revenue: advertising	154.40	208.36	243.99	267.25	228.54
Business revenue: other	0	0	0	0	0
Government fund (subsidies, etc.)	33.64	47.51	50.26	78.89	102.58
Other revenue	0	0	0	0	5
Total annual expenditure	184.18	258.77	295.21	334.86	329.46
Personnel expenses	23.26	26.35	34.75	41.04	56.11
Program production & purchase cost	13.52	10.11	13.70	13.91	10.75
General overhead	98.94	187.98	178.79	229.33	213.73
(Incl. maintenance cost)	3.92	5.21	6.62	8.01	2.11
Capital investment	16.81	5.21	24.28	6.50	15.23
Payment to the government	1.34	5.41	5.41	12.61	27.10
Other expenditures	30.31	23.71	38.28	31.47	6.54

Source: Document provided by Executing Agency

3.5.4 Current Status of Operation and Maintenance

According to NXTV, maintenance and inspection/repair of the equipment and facilities managed by the Technology Center, the Transmission Center, and the Logistics Support Service Center are conducted once per week. Virtually all of the delivered equipment and facilities are working normally, and there are no major problems in maintenance. As for the spare parts for Japanese-made equipment, no problem has occurred because paid services are available after the expiration of the manufacturers' warranty. Therefore, it is considered that operation and maintenance are performed without notable problems.

As discussed above, no major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance system. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The goal of this project was to improve the quantity and quality of TV and radio programs in Ningxia Hui Autonomous Region by updating the broadcasting infrastructure and providing training to the staff of the broadcasting stations. This would contribute to the advancement of education, knowledge enhancement, and cultural enrichment of the citizens in the Autonomous Region and also to the promotion of mutual understanding between China and Japan. The project was highly relevant to the development plans and development needs of China in a consistent manner from the appraisal to the ex-post evaluation, and also to Japan's assistance policy for China at appraisal; therefore, its relevance is high. More outputs were produced than originally planned because of a significant change in the execution plan during the implementation process in order to properly meet new needs emerging from advances in technology and the executing agency's expanded scope of business. Thus, the project cost appropriately reflected the outputs actually produced. The project period, however, significantly exceeded the plan; therefore, its efficiency is fair. The project significantly contributed to the improvement of the broadcasting programs in quantity and quality, and has had a certain observable impact; therefore, its effectiveness and impact are high. No major problems have been observed in the institutional, technical, or financial aspects of the operation and maintenance system; therefore, sustainability of the project effects is high. In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Through the comprehensive introduction of broadcasting equipment and related facilities, this project realized program production and airing at a high technical level and an efficient work system at the new broadcasting center of NXTV. As a result, the station now possesses advanced equipment

and facilities, which are remarkable among the province/autonomous region-level broadcasting stations in China, and the employees are highly motivated to work in operation and maintenance. Now that the improvement of hardware has come to an end, the station is strongly aware of the need to recruit and develop production engineers who have the ability to plan, gather material, and edit so that the station can produce and air more attractive programs. Improving the abilities of personnel who use the equipment and facilities provided in this project is crucial to the full manifestation and continuation of the project's effects. Since competition with other broadcasting stations in the country and other media is expected to continue, the station should strengthen medium-term personnel recruiting and development plans beyond the short-term satisfaction of manpower needs in order to improve the production capabilities of the organization as a whole.

4.2.2 Recommendations to JICA

Concerning the question of how the executing agency can improve its production capabilities as an organization, the production engineers working at NXTV commented that their interaction with the production engineers from broadcasting stations in Japan and other foreign countries provides an opportunity to learn not only how to use equipment but also to obtain concrete know-how and knowledge about work processes including planning, material gathering, and editing. This can be a very effective means for achieving improvement. JICA should consider activities to promote interaction between the production workers from Japanese and Chinese broadcasting stations. This responds to the needs of the executing agency to maintain the high effectiveness and motivation achieved in this project. The forms of such activities can be training in Japan and training and seminars in China.

As a concrete example, a seminar or domestic training session can be held, gathering the personnel from the production departments of broadcasting stations, including those in other provinces where the broadcasting projects from Japanese ODA loans were conducted simultaneously with Ningxia Hui Autonomous Region. Production personnel from Japanese broadcasting stations can be invited so that they can exchange information concerning trends in production technology in both countries and work knowledge. It may also be meaningful to promote interaction among the people in the same field of work, not only among production engineers but also among the workers in such fields as programming and maintenance.

4.3 Lessons Learned

(1) Sufficient Consideration of the Technological Advances in Equipment Upgrading Projects in Advanced Technology Fields

Major alterations were made to this project during its implementation. This resulted in the exclusion of civil engineering work from the Japanese ODA loan and the additional procurement of equipment and facilities. This was the most important cause that elongated the period of project implementation. On the other hand, this enabled adjustments to satisfy the wishes of the executing

agency, such as the new equipment procurement plan that reflected the development of broadcasting technology at the time of alteration and a change in broadcasting equipment, which was initially planned to be standard picture quality, to high-definition equipment. According to the executing agency, this enabled the station to “ride the wave” of high-definition TV, which was starting to be used at leading broadcasting stations in China at the time.

As a result, NXTV has become one of the stations with the most advanced equipment and facilities at present. This fact indicates that needs are changing continuously in fields with rapid technological evolution, and that the appropriateness of equipment selection at a point in time is inevitably associated with uncertainty. Furthermore, while the executing agency is generally highly satisfied with the equipment and facilities provided in this project, some of the individual packages caused delays in the project because an unexpectedly long time was needed during the approval process for the Japanese ODA loan by relevant authorities, or because rebidding became necessary.

Based on the above, the basic principle should be that relevant organizations in both countries reliably perform necessary procedures so that there is no delay in the project, and that the supervising and executing agencies and JICA conduct appropriate progress management. However, when a major delay has occurred and the project plan needs to be reconsidered, JICA should discuss this with the recipient side and, within the purpose of the project, select the equipment and facilities that meet the needs of the executing agency at the time, paying sufficient attention to trends in technology.

(2) Sufficient Confirmation of the Rules of the Japanese ODA Loan and the Procurement Laws of the Project Site Country

The civil engineering component, which was included in the initial project plan, later came to involve a problem because of a policy change in China: that the requirement of the nationality of the main contractor under the STEP rule contradicted a domestic rule in China. This necessitated a major revision to the project plan, resulting in the exclusion of civil engineering works from the Japanese ODA loan project and a plan for additional procurement of equipment and facilities. Such situation was difficult to foresee, because the Chinese government had assured a lack of contradiction with domestic laws when the L/A took effect. Generally speaking, there always is a risk that procurement rules of the recipient country may be amended or their implementation may be changed after the start of the project in a way that affects the Japanese ODA loan project, and it is impossible to avoid such risk completely. However, when a project is the first case of procurement under the STEP conditions in a country, as was the case in this project, and when a project is conducted in a country with little experience in Japanese ODA loan projects not limited to those under STEP conditions, it should be ensured that the project plan is based on the procurement rules and the cases of their implementation. Even in the case of a country with much experience in Japanese ODA loan projects, prior confirmation of the enacted and expected amendment to procurement-related laws should be performed meticulously to reduce this risk as much as possible.

(3) Importance of the Assessment of Achievement and Risk in Highly Difficult Soft Component

The soft component planned in this project included training, the purchase of Japanese television programs, and co-production with Japanese broadcasting stations. Unlike the hard component, in which procurement is conducted based on a more or less concrete plan, the soft component in this project involved challenging activities that aimed to promote mutual understanding between Japan and China on the basis of many uncertain factors such as business decisions of the broadcasting stations in both countries, negotiations between broadcasting stations, and the policies of both countries. In planning such a difficult soft component, it is necessary to carefully locate and assess the extent of risks to achievement, beginning at the time of appraisal. In particular, if the activities in the soft component are susceptible to the direct impact of policies and regulations, such as licensing and approval of the government, we need to conduct information processing and analysis in advance that focuses on feasibility. For example, a major factor that impeded the purchase of Japanese programs in this project was the policies and regulations of the Chinese authorities. According to documents provided by JICA, although the past records of the purchase of foreign-made programs were confirmed, the possibility of restrictions on the purchases or imports of foreign-made programs was not recognized as an explicit risk at the time of appraisal, and a survey on relevant policies and rules was commissioned after the beginning of the project.

For a highly difficult soft component, setting high goals at the time of planning to maximize the effects of a bilateral cooperation project is a strategy that should not be rejected. On the other hand, proper recognition of the risks that can greatly affect the manifestation of effects and sufficient sharing of this recognition between the two countries in advance would provide the basis for a common understanding among the people from both countries as to how much success would be probable in reality. Explicit indication of such risks at the time of appraisal would also facilitate a convincing ex-post verification of the actual results.

(4) Importance of Coordination Between Civil Work and Equipment/Facilities Procurement and Overall Work Management in a Project Combining These Two Components

In this project, the civil engineering works that were excluded from the Japanese ODA loan were conducted using the fund from the Chinese side. However, the mismatch in timing of the progress of construction works and the procurement of equipment and facilities resulted in procurement of items in the wrong order and problems in the compatibility of specifications for some pieces of equipment, leading to a delay in the completion of the broadcasting center. In a project combining civil engineering works and the procurement of equipment and facilities, such as this project, overall work management must be conducted to pay sufficient attention to the fact that the timing of the procurement of equipment and facilities can be affected by the progress of civil works. In particular, when civil engineering works and the procurement of equipment and facilities are conducted using different fund sources, the executing agency must pay special attention to ensure proper coordination between these two components.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs "Hard" Component	<Ningxia TV Station> ・Construction of broadcast center (total floor area: 32,300 m^2) ・Studio equipment (digital cameras/recorders, satellite program receivers, monitors, lighting, etc.) ・Broadcasting van	<Ningxia Radio and TV Station> ・Construction of broadcast center (total floor area: 32,300 m^2) (procured by the Chinese fund) ・TV Studio equipment (digital cameras/recorders, satellite program receivers, monitors, lighting, nonlinear program and network system, etc.) ・Broadcasting van (Digital SD TV OB van, HD OB van, microwave television relay vehicle, etc.) ・Radio Broadcast System (production system, live broadcasting system, recording room equipment, radio relay vehicle, etc.) ・Electrical machinery (elevators and Power-generating equipment)
"Soft" Component	<Ningxia TV Station> ・Training (editing technique: 2 months × 4 staff; transmission: 2 months × 4 staff): total 480 person-days ・Collaboration with Broadcasting System of San-in (BSS) and NHK ・Purchase of programs/broadcasting rights of programs produced in Japan ・Co-production of programs with Japanese broadcasting stations	<Ningxia Radio and TV Station> ・Technical training (editing technique: 7 days × 2 staff; transmission: 15 days × 2 staff): total 104 person-days ・Collaboration with Japanese broadcasting stations, and purchase of programs/broadcasting rights of programs produced in Japan, were not implemented ・Co-produced TV programs titled "Common Wish" (20 min) and "Future" (20 min) with a Japanese production company
Consulting Services	(a) Support in procurement ① Preparation of detailed design (D/D) and pre-qualification (P/Q) documents ② Evaluation of P/Q results ③ Preparation of tender documents ④ Evaluation of tender results (b) Support in training and others ① Training in Japan	(a) Support in procurement ① Preparation of detailed design (D/D) and post-qualification documents ② Preparation of tender documents ③ Evaluation of tender results (b) Support in training and others ① Training in Japan

	② Co-production of programs with Japanese broadcasting stations ③ Purchase of Japanese programs and broadcasting rights	② Co-production of programs with a Japanese production company
2.Project Period	March 2004–June 2008 (52 months)	March 2004–May 2013 (111 months)
3.Project Cost		
Amount paid in Foreign currency	4,250 million JPY	4,248 million JPY
Amount paid in Local currency	1,016 million JPY (71 million RMB)	3,376 million JPY (242 million RMB)
Total	5,266 million JPY	7,625 million JPY
Japanese ODA loan portion	4,250 million JPY	4,248 million JPY
Exchange rate	1 RMB = 14.3 JPY (As of September 2003)	1 RMB = 13.9 JPY (Average between 2004 and 2013)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Public Health Project (Henan Province)"

External Evaluator: Takako Haraguchi, International Development Center of Japan Inc.

0. **Summary**

This project was to develop the facilities, equipment, and the human resources of the core organizations related to infectious disease control in Henan Province; namely, Centers for Disease Control (CDCs), infectious disease hospitals (IDHs) and emergency centers. This was performed with the objective of strengthening control of infectious diseases in the province as part of China's efforts to improve public health infrastructures that had been accelerated since the outbreak of severe acute respiratory syndrome (SARS) in 2002. The relevance of the project's implementation was high as the project's objective was consistent with China's development policies and development needs for improving its public health service system, including upgrading its infectious disease control capabilities. The project's efficiency was evaluated to be fair because, while the project cost was within the planned expenditure, the project period significantly exceeded the timetable, mainly due to delays in the procurement of equipment. The project's effectiveness and impact were evaluated to be high as it was observed that the target institutions had strengthened their respective capacities, specifically: (i) CDCs improved their testing and networking for infectious disease control; (ii) IDHs improved their ability to accept patients as well as their level of testing and treatment; and (iii) emergency centers improved their ability to promptly respond to emergency cases. Furthermore, through improved coordination among these institutions, integrated response to infectious diseases, e.g., occurrence of a disease, identification, transportation, and treatment, was strengthened and, thus, contributed to a reduction in the case fatality rate of infectious diseases in Henan Province. The sustainability of the project's effects was also evaluated to be high, as there were no serious problems in relation to the institutional, technical, and financial aspects, nor with regard to the current operation and maintenance status of the developed facilities and equipment.

In light of the above, this project is evaluated to be highly satisfactory.

1. **Project Description**

Project Location

A device for genetic testing and the usage record. This device was most useful in examinations of viruses. (Henan Province CDC)

1.1 Background

In China, total incidences of diseases defined by law as infectious had decreased since the mid 1980s, but, due to emerging infectious diseases such as AIDS and public health problems in rural areas, infectious disease control remained an important issue. It was under such circumstances that SARS occurred in November 2002 and rapidly spread. Consequently, this outbreak exposed the vulnerability of China's public health infrastructures; for example, its lack of an information network or warning system related to infectious diseases, the aging of some medical equipment and devices, a shortage of medical personnel in both quantitative and qualitative terms, and a shortage of investment funds.

In response to such a situation, the Chinese government developed national master plans to improve public health infrastructures. First, the Construction Plan of Disease Prevention and Control System aimed to strengthen the disease control system at the local government level by promoting the reinforcement of facilities/equipment and the training of the CDC[1] personnel. By the end of 2002, CDCs had been established in 3,580 locations at provincial, prefecture, and county levels across the country. Second, the Construction Plan of Medical Treatment System to Cope with Public Health Emergency aimed to develop emergency treatment networks for enhancing the management of and emergency treatment capacity for addressing sudden public health events such as outbreaks of infectious diseases, incidences of unknown diseases, mass epidemics of serious food poisoning, etc., by establishing emergency centers, infectious disease hospitals (or wards) and intensive care units (ICUs) in municipalities, provincial capitals, and prefecture-level cities nationwide.

This project targeted Henan Province, one of the eleven provinces in Central China where the largest population resided and concessional funds were particularly required[2].

1.2 Project Outline

The objective of this project was to strengthen infectious disease control in Henan Province by developing the facilities and equipment of basic institutions related to public health and by training personnel involved in infectious-disease control at provincial-level and prefectural-level cities, thereby contributing to the improvement of the health status of local residents.

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[1] A CDC is an organization in charge of public health administration that has similar functions to a health center and the public health institutes of Japan. The major tasks of a CDC include the prevention and management of serious diseases (e.g., pathogen analysis and monitoring), immunization, and food hygiene supervision. Institutionally, each of the central governments, provinces, prefectures, and counties has a CDC. A system had been in place in which information on infectious diseases collected at each CDC was sent to the central CDC. However, at the outbreak of SARS, it was heard that such a system did not fully function due to a lack of "hardware" and "software" and insufficient financial input from the Government of China (JICA documents at the time of appraisal).

[2] This project is one of the Japanese ODA Loan projects titled "Public Health Project" that were implemented in ten central provinces (i.e., all of the eleven central provinces except Hainan Province). The Loan Agreements were signed in 2004. In the other areas of China, similar measures to those supported under this project were to be basically implemented, using provinces' own funds in conjunction with subsidies from the central government in the coastal areas with notable economic development, and using loans from the German government combined with subsidies from the central government in the western areas.

Loan Approved Amount/ Disbursed Amount	5,016 million yen / 4,635 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2004 / March, 2004	
Terms and Conditions	Interest Rate	1.5%
	Repayment Period	30 years
	(Grace Period)	(10 years)
	Conditions for Procurement:	General Untied
Borrower / Executing Agency	The government of the People's Republic of China / Henan Provincial People's Government	
Final Disbursement Date	August, 2012	
Main Contractor (Over 1 billion yen)	None	
Main Consultant (Over 100 million yen)	None	
Feasibility Studies, etc.	F/S: "Feasible Research Report: Henan Public Health Infrastructures Construction Japanese-Yuan Loan Project," Henan Engineering Consulting Company, August, 2003.	
Related Projects	Training for Japanese ODA Loan Public Health Project (Henan Province) (Technical Assistance Related to ODA Loans, 2012–2013)	

This project targeted a total of 53 institutions, including CDCs, IDHs,[3] and emergency centers in the province along with all of the 18 prefecture-level cities (Zhengzhou, Kaifeng, Luoyang, Pingdingshan, Anyang, Hebi, Xinxiang, Jiaozuo, Puyang, Xuchang, Luohe, Sanmenxia, Shangqiu, Zhoukou, Zhumadian, Nanyang, Xinyang, and Jiyuan. See "3.2.1 Project Outputs" for details).

To implement the project, the Henan Provincial People's Government established the "Provincial Leader's Group for the Project," which included the Vice Governor assuming the role of Executive Director and consisting of top officials from the Financial Department, the Development and Reform Commission, and the Provincial Health and Family Planning Commission (PHFPC; known as the Health Department at the time of the commencement of the project). Under this, the Provincial Project Executive Office was established within the PHFPC. The Prefectural Project Executive Office established in each prefecture-level city assumed practical-project-implementation tasks at each of the

[3] Including Infectious Disease Departments of general hospitals.

53 institutions (i.e. subprojects). The information referred to in this report as "responses from the executing agency" was provided, unless otherwise mentioned, by the Financial Department and the PHFPC. Responses from agencies that implemented individual subprojects are described as "responses from the targeted institutions" or similar.

2. **Outline of the Evaluation Study**

2.1 External Evaluator

Takako Haraguchi, International Development Center of Japan Inc.

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – January 2016

Duration of the Field Study: November 23 – December 12, 2014 and March 9 –13, 2015[4]

3. **Results of the Evaluation (Overall Rating: A[5])**

3.1 Relevance (Rating: ③[6])

3.1.1 Relevance to the Development Plan of China

This project is consistent with China's development policies, as the development of the health service system, including the improvement of the capacity to handle infectious diseases, was an important issue in the national development plans and the health sector development plans of Henan Province, both at the time of appraisal and at the ex-post evaluation. First, regarding the national development plans, at the time of appraisal the 10th Five-year Plan for National Economic and Social Development (2001–2005) set an aim of "controlling and monitoring infectious diseases and endemic diseases, etc., by reinforcing emergency and disease prevention systems in urban areas." The national master plans mentioned in "1.1 Background" above were in line with this aim. At the time of the ex-post evaluation, the 12th Five-year Plan for National Economic and Social Development (2011–2015) states that to achieve its objective, namely to "improve the basic health care system," the plan will "strengthen the building of a public health service system" by implementing "major public health projects, strengthening the prevention and control of major communicable diseases as well as chronic, occupational, endemic and mental illness, and enhancing our capacity to respond to public health emergencies."

Next, regarding the health sector development plans of Henan Province, at the time of appraisal the 10th Five-year Plan for Health Sector Development in Henan Province (2001–2005) concerned public health issues such as the strengthening of the disease prevention system, the development of a hygiene control system, the strengthening of the information networks and surveillance systems,

[4] As the number of targeted institutions was large, the evaluators could not visit all of them. Nevertheless, a questionnaire was distributed to every institution for the collection of quantitative data. Genuine responses were obtained from 47 of the 53 individual targeted institutions. Brief information on the institutions that did not provide specific answers was obtained from the executing agency (Financial Department and PHFPC). Visits were made to 17 targeted institutions, the provincial CDC, six prefecture-city CDCs, five IDHs, and five emergency centers in five municipality/prefecture level cities.

[5] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[6] ③: High, ② Fair, ① Low

etc. At the time of the ex-post evaluation, the 12th Five-year Plan for Health Sector Development in Henan Province (2011–2015) had been introduced. This aimed at the standardization of or meeting the national standard of disease prevention and control in terms of number of personnel, infrastructure, and equipment, etc.; strengthening the laboratory network; strengthening the surveillance and emergency response system for major infectious diseases; the development of specialized medical facilities such as IDHs; the development of an emergency medical system; etc.

The aims of this project, i.e., development of the facilities/equipment and human resources of CDCs, IDHs, and emergency centers, are all included in these important issues.

3.1.2 Relevance to the Development Needs of China

This project is mostly consistent with China's development needs. At the time of appraisal, the public health infrastructures and systems for responding to infectious diseases (information networks) were weak and, thus, required strengthening. In Henan Province, by the time of the ex-post evaluation, CDCs had been established at provincial level and in all of the 18 prefecture-level cities and 158 counties, six of 18 prefecture-level cities had hospitals that specialize in infectious diseases, and emergency centers were present in 10 prefecture-level cities. Construction of emergency centers is also in progress at county level. The importance of these institutions remains high as they have already played public health-related roles in their respective regions.

Incidences and the mortality rate of diseases defined by law as infectious fluctuate in both China and Henan Province (Table 1). Both the incidences and mortality rate of viral hepatitis and AIDS in Henan Province are higher than the national average. Also, while not mentioned in the table, there were outbreaks of the new influenza (H1N1) in 2009 and in 2013, the human avian influenza (H7N9), and emergent occurrences of some other infectious diseases[7]. These show the constant need to be prepared for such epidemics.

In addition, a small number of the targeted IDHs and emergency centers commented that infection does not always occur and, thus, the equipment procured under this project is also in high demand for examination, diagnosis, and emergent responses related to non-infectious diseases. It is considered that this opinion does not lessen the need for infectious disease control.

[7] Emergent infection cases in Henan Province include salmonella (2012) and dengue fever (2013). Regarding emerging infectious diseases, the new influenza (H1N1) became epidemic in 2009 and 2013 and the human avian influenza (H7N9) in 2013. Total cases of incidence of emerging infectious diseases are as follows: 1,230, 242, 0 for the new influenza and 0, 4, 0 for the avian influenza in 2009, 2013, and 2014, respectively (source: responses from the executing agency).

Table 1: Incidence and mortality rate of major infectious diseases

(Unit: Number of cases per 100,000 people)

		Designated infectious diseases*		Viral hepatitis		Pulmonary tuberculosis		Dysentery		Gonorrhea		Measles		AIDS	
		2002	2014	2002	2014	2002	2014	2002	2014	2002	2014	2002	2014	2002	2014
Incidence	China	180.14	207.17	66.10	95.45	43.58	66.79	36.23	13.93	13.28	7.36	4.76	2.04	0.06	3.12
	Henan Province	318.5 (2005)	195.06	81.11	118.97	38.32	67.06	35.31	18.71	4.36	2.88	2.64	0.88	2.86	3.40
Mortality Rate	China	0.35	0.11	0.08	0.05	0.08	0.19	0.02	0.00	0.00	0.00	0.01	0.00	0.02	0.84
	Henan Province	1.06 (2005)	1.27	0.22	0.06	0.02	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.62	1.71

Sources: JICA documents; responses from the executing agency; China Health Statistical Yearbook 2010.

Note: In 2002, "designated infectious diseases" consisted of 26 Class A and Class B diseases from a total of 35 diseases (in descending order according to hazardous nature: two Class A, 24 Class B, and nine Class C) defined in the Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases (enforced in September 1989). In 2014, "designated infectious diseases" consisted of 28 Class A and Class B diseases from a total of 39 diseases (two Class A, 26 Class B, and 11 Class C) defined in an amendment to the law mentioned above (enforced in December 2004; revised in 2013). In the 2004 amendment to this law, SARS and human avian influenza (H5N1 and H7N9) were added as Class B diseases. In 2009, the new influenza (H1N1) was added as a Class B disease. In the 2013 revision to this law, H1N1 was changed to a Class C disease. The individual diseases mentioned in this table are all Class B diseases.

3.1.3 Relevance to Japan's ODA Policy

At the time of appraisal, this project was consistent with Japan's ODA policies. First, the priority areas of the Country Assistance Policy for China (2001) included "assistance in infectious disease control" and "strengthening of human resource development, such as through the dispatch of experts and acceptance of trainees" as methods of providing assistance to cope with global issues. Additionally, the priority areas of the Country Assistance Strategy for the 2003 fiscal year created by the Japan International Cooperation Agency (JICA) (Japan Bank of International Cooperation at the time of appraisal of this project) included, as a means of addressing the need to respond to the weaknesses of the public health system revealed by the rapid spread of SARS, a plan to support the development of basic facilities and human resources for public health that would contribute to the reinforcement of infectious disease control.

In this way, this project has been highly relevant to China's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

At the time of appraisal, the planned outputs were: (1) procurement of equipment (through a Japanese ODA loan and funds from the Chinese side), (2) civil works (through funds from the Chinese side), and (3) training to strengthen the capacities of personnel in charge of infectious disease control (through funds from the Chinese side). These were implemented for a total of 53 institutions, including 19 CDCs (one provincial and 18 prefectural) in 18 prefecture-level cities, 17 IDHs in 17 prefecture-level cities, and 17 emergency centers in 17 prefecture-level cities (the IDH

and emergency center in Zhengzhou were not included). The outputs that were actually realized were almost identical to those planned, although a small area of the plan was modified and additional equipment were procured for non-infectious diseases.

(1) Procurement of equipment

Table 2 shows the plan at the time of appraisal in comparison to the actual equipment procurement. There were some modifications, such as an adjustment of the quantities due to a review of the demands, a change of items due to the realization that some of the planned equipment had become obsolete before it was procured, and some equipment that was urgently required was procured using funds from the Chinese side without waiting for this project. While it is considered reasonable that the project re-selected items in accordance with the circumstances, such a change of items would have been unnecessary if the project had not been delayed (see "3.2.2.2 Project Period").

The additional procurement was made using the remaining balance of the Japanese ODA loan. As a result, equipment outside the scope of the original plan was procured in recognition of the need to responding to emergency public health cases other than those that concern infectious diseases. In addition, due to a policy change, the hospital that was planned to be the targeted IDH in Luoyang became a general hospital for the prefecture (another hospital was designated as the IDH and the facilities and equipment there were developed using the provincial and prefectural funds). This meant that this project partly covered the procurement of equipment for responding to non-infectious diseases, which is not considered to be a problem because responses to non-infectious diseases will be effective in preventing infection by improving people's health. Additionally, such procurement does not contradict the project objective stated in the Loan Agreement[8].

The items to be procured were selected in the following way: the provincial PHFPC and the 53 targeted institutions, which virtually implemented this project, prepared a standard list of equipment, consisting of the basic equipment and recommended equipment, for each type of institution; the individual targeted institutions added specific information to the list, such as existing equipment and equipment that was planned to be procured, and then selected the items they required.

[8] The Loan Agreement states satisfaction of public health needs, improvement of people's health status, building of local governments' capacity to respond to sudden public health incidents, etc., as the project objectives. The objective mentioned in "1.2 Project Outline" of this report is the reordering of the more specific objectives described in the appraisal documents.

Table 2: Planned and actual equipment procured

Institution	Plan (appraisal)	Actual
CDCs	A total of 2,857 pieces for 19 institutions (one provincial and 18 prefectural CDCs). ・ Laboratory testing equipment (Categories A, B, and C) ・ Equipment for health education such as projectors and information devices such as data servers. ・ Emergency examination and processing vehicles for epidemic situations, etc.	A total of 2,508 pieces for 19 institutions. (Originally planned) A total 2,483 pieces for 19 institutions. The procuring of types of equipment mostly adhered to the plan except for some changes of items (Categories A, B, and C). (Additionally procured) A total of 25 pieces for five institutions, mainly consisting of laboratory testing equipment (Category X).
IDHs	A total of 2,747 pieces for 17 institutions (located in 17 prefecture-level cities except Zhengzhou), including diagnostic equipment such as electrocardiographs (ECGs), disinfectant and treatment equipment, beds, ambulances, on-board equipment for ambulances, etc. (Categories A, B, and C).	A total of 2,873 pieces in 17 institutions. (Originally planned) A total of 2,826 pieces for 17 institutions. The procuring of types of equipment mostly as adhered to the plan except for some changes of items (Categories A, B, and C). In Luoyang, the targeted institution was designated as a general hospital, not an IDH. (Additionally procured) A total 47 pieces for six institutions, including diagnostic equipment such as CT scanners (Category D) and laboratory testing equipment (Category X).
Emergency centers	A total of 802 pieces for 17 institutions (located in 17 prefecture-level cities except Zhengzhou), including ambulances (normal and negative pressure), ECGs, etc.	A total of 836 for 17 institutions. (Originally planned) A total of 791 pieces for 17 institutions. The procuring of types of equipment mostly as adhered to the plan except for some changes of items (Categories A, B, and C). (Additionally procured) A total 45 items for two institutions, including diagnostic equipment such as CT scanners (Category D) and laboratory testing equipment (Category X).

Sources: JICA documents; documents provided by the executing agency; responses from the executing agency and targeted institutions.

Note: In the appraisal, the equipment required for each targeted institution was classified in the categories listed below. The executing agency agreed that those classified under Category A, B, or C were eligible for procurement using the ODA loan.

Category A: equipment recognized as basic equipment for infectious disease control; Category B: recommended equipment for infectious disease control; Category C: general equipment required for infectious disease control; Category D: equipment not related to infectious diseases; Category X: equipment related to infectious disease control but not recognized as those within the scope of the ODA loan under this project. In the additional procurement, Category D and Category X equipment were procured using the ODA loan.

(2) Civil works

The civil works implemented through this project involved the new construction or the extension and/or rehabilitation of the facilities of the targeted institutions, which constituted part of the civil works implemented with the funds provided by the Chinese government. Among the targeted institutions, six IDHs were newly established facilities. For some institutions, the floor area actually developed was increased or decreased from the original plan as a result of design changes. Also, in interviews conducted for this ex-post evaluation, a small number of institutions indicated that some construction work implemented outside the scope of this project was recorded as a planned or actual output of this project, showing a problem relating to recording inaccuracies.

It was reported by the executing agency that the design and construction of facilities such as the CDCs' laboratories and the isolated waiting rooms and negative pressure wards of the IDHs satisfied the biosafety standards of the World Health Organization (WHO) and the Chinese government.

Table 3: Planned and actual civil works (funded by the Chinese side)

Institution	Plan (appraisal)	Actual
CDCs	A total of 82,309m^2 for 19 institutions, including the expansion (nine institutions), new construction, and moving (10 institutions) of laboratory buildings.	A total of 76,689m^2 for 18 institutions. The civil works for Zhengzhou CDC were implemented as part of developments made outside this project (the reason why this was included in the project scope at the time of the ex-ante evaluation is unknown).
IDHs	A total of 208,088m^2 for 17 institutions, including the expansion (11 institutions) and new construction (six institutions) of infectious disease wards.	A total of 166,403m^2. The civil works on Kaifeng IDH (expansion of the existing facilities) were implemented as part of developments made outside this project (the reason why this was included in the project scope at the time of the ex-ante evaluation is unknown).
Emergency centers	None	3,000m^2 for one institution (Pingdingshan).

Sources: JICA documents; responses from the executing agency and targeted institutions.

A biological safety cabinet installed at a prefectural CDC (Xinxiang).

An infectious-disease ward. The building is designed to control infection through the use of design aspects such as negative pressure and double (isolated) corridors (Anyang).

Ambulances at an emergency center. The nearest vehicle is a negative pressure ambulance (Luoyang).

(3) Training to strengthen the capacities of the personnel in charge of infectious disease control

The project's plan included activities such as sending the personnel in charge of infectious disease control to upper-administrative-level institutions in China for a short or medium time period and inviting Chinese experts from Beijing, Shanghai, etc., to Henan Province, all through the use of Chinese funds. The planned and actual numbers of trainees are reported in summary in Table 4, although the numbers vary by institution (i.e., absolute number of persons, cumulative total, man-months). It should be noted that the targeted institutions did not have detailed figures such as how many were sent to other institutions, how many were trained at their own institutions, or the number of experts invited and the dates of the visits. Additionally, a Japanese expert was reportedly invited for one month to teach how to operate the equipment procured for infectious disease control, although details on this are not clear.

After the completion of this project, "Training for Japanese ODA Loan Public Health Project (Henan Province)" (2012–2013), a form of technical assistance related to ODA loans, was implemented and approximately 1,600 persons received further training on topics such as operation

of equipment, testing and diagnosis, etc.

Table 4: Planned and actual numbers of trainees (funded by the Chinese side)

Institution	Plan (appraisal)	Actual
CDCs	A total of 660 persons from 19 institutions	A total of 1,095 persons from 19 institutions
IDHs	A total of 1,099 persons from 17 institutions	A total of 1,037 persons from 17 institutions
Emergency centers	None	A total of 3,677 persons from 17 institutions

Sources: JICA documents; responses from the executing agency and targeted institutions.
Note: Counting methods vary by institution (i.e. absolute number of persons, cumulative total, man-months).

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual total project cost was 6,249 million yen (of which 4,635 million yen was sourced from the ODA loan) and this was lower the planned cost (ratio to the planned amount was 90%, or 82% when only counting the actual amount spent on the originally planned outputs, i.e., excluding the expenses for the additional outputs; see Table 5 for breakdown). A report made by the executing agency states that the project cost was lower due to efficient contracting, which resulted from international competitive bidding and changes in the exchange rate.

Table 5: Planned and actual project costs

(Unit: million yen)

	Plan (appraisal)						Actual					
	Foreign currency		Local currency		Total		Foreign currency		Local currency		Total	
		ODA Loan		ODA Loan		ODA Loan		ODA Loan		ODA Loan		ODA Loan
Procurement of equipment	4,576	4,576	0	0	4,576	4,576	4,635	4,635	192	0	4,852	4,635
Civil works	0	0	1,418	0	1,418	0	0	0	1,206	0	1,206	0
Training	0	0	50	0	50	0	64	0	128	0	192	0
Administration cost, etc.	0	0	243	0	243	0	0	0	0	0	0	0
Price escalation	211	211	4	0	215	211	0	0	0	0	0	0
Physical contingencies	229	229	86	0	315	229	0	0	0	0	0	0
Interest during construction	0	0	121	0	121	0	0	0	0	0	0	0
Total	5,016	5,016	1,922	0	6,938	5,016	4,699	4,635	1,525	0	6,249	4,635

Sources: Prepared based on JICA documents and responses from the executing agency.
Notes: 1) The procurement of the equipment described in the original plan actually cost 3,772 million yen. 2) Planned exchange rate: 1 yuan = 14.3 yen; actual exchange rate: 1 yuan = 14.0 yen (the average during the period between 2003 and 2012 was applied since the figures in local currency for yearly expenses were not available).

3.2.2.2 Project Period

The project period was planned to be 34 months, from March 2004 (the date that the Loan Agreement was signed) to December 2006 (the date of the project's completion and of the handover of the equipment); however, the actual period was 102 months, from March 2004 to August 2012 (the date the handover of equipment was completed), which was significantly higher

the planned timetable (the ratio to the planned number of months was 300%, or 171%[9] when only counting the number of months spent on the originally planned outputs, i.e., excluding the period exclusively spent on the additional outputs; see Table 6 for details). Major reasons for the longer project period include, besides the additional outputs, delays in tender procedures for the procurement of equipment and delays in the delivery of some equipment by contractors. Nevertheless, it could be said that the delays were maintained at a minimum considering that the executing agency had never before handled an international competitive bidding that was as large-scale and complex as this.

Training was also delayed because it was implemented in conjunction with the procurement of equipment.

The civil works component was delayed for only two institutions as a result of, according to the executing agency, a shortage of funds on the part of the contractor.

Table 6: Planned and actual project periods

	Plan (appraisal)	Actual
Signing of the Loan Agreement	March 2004	March 2004
Civil works	September 2003 – January 2006	March 2003 – January 2007 (mostly as planned except for two institutions)
Procurement of equipment (Tender)	August 2004 – March 2006	March 2004 – September 2010 (the originally planned portion was completed within 2006)
Procurement of equipment (manufacturing, transportation and installation)	July 2005 – December 2006	December 2004 – August 2012 (the originally planned portion was completed within 2008)
Training	May 2004 – March 2006	May 2004 – May 2012
Project completion (duration)	December 2006 (34 months)	August 2012 (102 months)

Sources: Prepared based on JICA documents, documents provided by the executing agency, and responses from the executing agency.

Note: The documents provided by the executing agency state that the project completion date (the date the procurement of equipment was competed) was June 2013. The evaluator confirmed with the executing agency that the project period featuring that completion date included the test run period for the equipment delivered and the training period under the Technical Assistance Related to ODA Loans, and that the "handover" of equipment, the project completion date defined at the signing of the Loan Agreement, and the training implemented as a part of this project had been completed in August 2012.

3.2.3 Results of Calculations of Internal Rates of Return (Reference only)

Due to the nature of the project, a quantitative analysis of the internal rate of return (IRR) was not possible. As the IRR was not calculated at the time of appraisal, IRR calculation was not included in the scope of the ex-post evaluation.

As stated above, although the total project cost was within the plan, the project period significantly

[9] Although the exact completion date of the originally planned portion was not specified, based on the information from the executing agency that the original portion was completed in 2008, it has been provisionally assumed to have been completed in December 2008.

exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[10] (Rating: ③)

After completion of the project, the operation and effect indicators generally showed improving trends and mostly satisfied, when there were any, the standards (or defined values) set by the Chinese government. It was observed that the targeted institutions were capable of better performing their respective functions, namely: CDCs' prevention of infectious diseases and response to outbreaks, IDHs' diagnosis and treatment of infectious diseases, and emergency centers' transportation and pre-hospital care of patients, by utilizing the facilities and equipment developed as a result of this project. Therefore, it can be said that the project's objective of strengthening infectious disease control in Henan Province was achieved.

3.3.1 Quantitative Effects (Operation and Effect Indicators)[11]

(1) Improvement of infectious-disease-control functions throughout Henan Province

It is considered that infectious disease control in the province as a whole improved after the project, as "the number of beds for infectious diseases per population" and "time required from an outbreak to the reporting of an infectious disease" (both are classified as operation indicators) showed improvement or satisfied the defined values (see Table 7).

Table 7: Operation and effect indicators (throughout all of Henan Province)

	Baseline	Target	Actual	Actual
	2002	2006	2012	2014
	Baseline Year	Completion Year	Completion Year	2 Years After Completion
1) Number of beds for infectious diseases per population (per 1,000 persons) *1	0.04	0.05	0.42	0.34
2) Time required from an outbreak to the reporting of an infectious disease	Not mentioned	24 hours*2	24 hours	24 hours

Sources: JICA documents; documents provided by the executing agency; responses from the executing agency.
Notes: 1) Corresponding to one of the operation and effect indicator set at the time of appraisal. 2) The value defined by Henan Province. The planned value at the time of appraisal is unknown.

[10] The sub-rating for effectiveness is to be given with consideration of the impact.

[11] Three operation and effect indicators were set at the time of the appraisal of this project, namely: (a) the number of beds for infectious diseases per population, (b) the laboratory testing capacity of the provincial CDCs (degree of increase of testable items), and (c) the fatality rate of infectious diseases and the fatality rate in emergency departments. In this ex-post evaluation, indicators (a) and (b) were classified as operation indicators and indicator (c) was classified as an effect indicator. However, these indicators were insufficient to ascertain whether different types of institutions, including prefecture-level CDCs and emergency centers, utilized their facilities and equipment and produced effective results. Therefore, the evaluator additionally used some supplementary indicators based on a reference document provided by JICA. As these additional indicators did not have specific target values for this project, the degree of their achievement was examined either (i) by applying the standards designated by the Chinese government or the judgment criteria used in an ex-post evaluation conducted in 2012 for the Public Health Projects in the provinces of Hunan, Jiangxi, Anhui, Shanxi, Jilin, Heilongjiang, and Liaoning (hereinafter called "the preceding ex-post evaluation"), or (ii) by analyzing changes before and after the implementation of the project by using yearly data.

It is also noted that most of the indicators used for this evaluation are not listed as "operation indicators" or "effect indicators;" therefore, the evaluator classified them into operation indicators and effect indicators based on the nature of each indicator.

(2) Enhancement of the infectious-disease-control functions of individual institutions

1) CDCs

Table 8 shows major indicators (all classified as operation indicators) that reached an approximately satisfactory level. Therefore, it is considered that the functions of CDCs were enhanced as a result of this project.

"The number of testable items within the test items defined by law" significantly increased after the project in terms of both the total number of items a CDC could test for and the test items focused on in this project. The provincial CDCs achieved the target of acquiring 85% of the designated test items. Although the average for the prefectural CDCs was slightly below 85%, when examining the data for the individual institutions it can be said that they almost achieved the target (while not shown in the table, eight of the 16 institutions that responded to the questionnaire for the ex-post evaluation achieved over 85% and their number of testable items focused on in this project remarkably increased). In particular, an important outcome highlighted by all of the respondent institutions was that they had become capable of performing nucleic acid testing for viruses (such as influenza viruses) and bacteria.

"The total number of samples tested" increased, while the figures disaggregated by disease fluctuated depending on incidences of the concerned diseases. "Time required for reporting test results" was shortened. Such trends show that the equipment for testing samples has been appropriately incorporated. In addition, although not shown in the table, the false-positive rate that shows the accuracy of testing results (the higher, the more accurate) almost reached 100% for major diseases during the period between 2002 and 2007 and maintained that level thereafter.

The operational status of major testing equipment (procured in the course of this project) was mostly good. The utilization rate[12] reported by 14 targeted institutions was over 80% for the majority of the major equipment. The types of expensive equipment that they commonly identified as particularly useful included quantitative fluorescence PCR[13] machines (for nucleic acid testing of bacteria and viruses) while, in relation to equipment important for infectious disease control regardless of price, biological safety cabinets (for handling biohazards) were also noted as particularly useful. For equipment with low utilization rates, they named microorganism analyzers (the production of this machine's reagent was discontinued in 2012) and some others that they use less frequently after they purchased upgraded models). Nevertheless, the respondent institutions said that they had fully used all such equipment until they purchased new versions with their own budgets. The average utilization rate of such equipment was approximately 70%.

Training provided by the targeted CDCs for CDC personnel at subordinate administrative levels also increased. However, at the time of the ex-post evaluation, only five institutions answered that

[12] In the responses from the targeted institutions, a utilization rate was defined as the ratio of actual operation hours to expected operation hours, both of which were represented in terms of an accumulated total during the period from installation to the time of this ex-post evaluation.

[13] PCR stands for polymerase chain reaction.

they still use the training equipment procured in the course of this project (such as projectors). As most of the training equipment had been purchased in approximately 2006, many institutions have already replaced them with newer versions.

Table 8: Operation and Effect Indicators (CDCs)

Average of responses from CDCs		Baseline 2002 Baseline Year	Target 2006 Completion Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
1) Number and percentage of testable items among CDCs' designated test items[*1]					
Provincial CDC	Total (Designated=426 items)	250 (59%)	362 (85%)[*3]	418 (98%)	426 (98%)
	This project[*2] (Designated=164 items)	88 (54%)	139 (85%)	163 (99%)	163 (99%)
Prefectural CDC	Total (Designated=381 items)	140 (37%)	324 (85%)	232 (61%)	234 (61%)
	This project (Designated=147 items)	59 (40%)	125 (85%)	111 (75%)	113 (77%)
2) Number of samples tested[*4]					
Influenza		60	Not mentioned	317	426
AIDS		501	Not mentioned	877	1,622
Hand-foot-and-mouth disease		0	Not mentioned	345	232
3) Time required for the testing of a sample (hours)					
Influenza		5.5	Not mentioned	5.1	4.7
AIDS		3.5	Not mentioned	2.3	2.3
Hand-foot-and-mouth disease		-	Not mentioned	3.8	3.8
4) Number of trainees that participated in the training organized by the CDC (persons)		368	Not mentioned	1,141	998

Sources: JICA documents; responses from targeted institutions (valid responses from 16 institutions).

Notes: 1) Corresponding to one of the operation and effect indicators set at the time of appraisal. 2) The rows titled "This project" concern the test items for diseases that this project aimed to address, namely, acute communicable/foodborne/waterborne diseases, viral diseases, parasitic diseases, microbial diseases, etc. 3) The target value of 85% of designated test items is a guide that was used in the preceding ex-post evaluation. Therefore, actual performance that is lower than this value does not necessarily signify a lower evaluation of effectiveness. 4) For this indicator and those thereafter, the figures represent average values for all respondent CDCs because no differences were seen between the provincial and prefectural CDCs. The figures for "the number of samples tested" for 2002 (non-zero values show that testing had been possible before this project) in relation to influenza were provided from the provincial CDCs only and, in relation to AIDS, by the provincial and Hebi CDCs.

2) IDHs

Table 9 shows major indicators[14]. As all of these indicators show improving trends, it is considered that the functions of IDHs were enhanced. It should be noted that such improvements are partly due to factors outside this project (i.e., effects of investment in facilities receiving funding from the Chinese side).

"In-hospital infectious rate," "in-hospital mortality rate," and "the number of tests implemented" all show improving trends. All of the institutions that responded to the questionnaire provided positive comments concerning the effects of this project, such as the increase in the amount of testing they can conduct and the increase in items that they can test in their institutions, which in turn leads to more prompt treatment.

[14] Of the twelve IDHs that provided valid answers, the data from the hospital in Luoyang were excluded from this analysis as it was not an IDH. The data from this hospital are used in "3.4.2 Other Impacts."

Among the indicators shown in Table 9, "in-hospital infection rate" and "in-hospital mortality rate" were classified as effect indicators, while the rest were classified as operation indicators.

"The number of patients" and "the number of beds" also increased. This project contributed to the increase in patients as it increased the IDHs' capacity to accept a larger number of patients. This was achieved by developing facilities for in-patients and equipment for testing, diagnosis, and treatment. Similarly, the project directly contributed to the increase in "the number of beds" by procuring between 40 and 200 beds per hospital.

The operational status of the equipment procured under this project was good. In 2014, the average utilization rates of such equipment was over 90% for ICU equipment and around 84% for testing equipment. Among the expensive equipment, automatic biochemical analyzers were identified by the responding IDHs as particularly useful and, among important equipment for infectious disease control regardless of price, bedside monitors and TV patient monitors were also noted as particularly useful.

Table 9: Operation and Effect Indicators (IDHs)

Average or total of answers from IDHs	Baseline 2002[*1] Baseline Year	Target 2006 Completion Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
1) In-hospital infection rate (%) (average)[*2]	1.19	Not mentioned	1.54	0.90
2) In-hospital mortality rate (%) (average)	0.77	Not mentioned	0.59	0.43
3) Number of tests implemented (total)				
Bacteriological test	24	Not mentioned	20,392	22,405
Biochemical test	10,989	Not mentioned	92,798	126,772
Blood cell test	11,703	Not mentioned	81,841	100,071
4) Number of patients (person) (average)				
Outpatients – infectious diseases	10,707	Not mentioned	26,245	24,845
Inpatients – infectious diseases	693	Not mentioned	4,126	7,841
5) Number of beds (average)	95	Not mentioned	164	190

Sources: JICA documents; responses from targeted institutions (valid responses from 11 institutions).
Notes: 1) The figures for 2002 are based on responses from the four institutions that had already conducted testing as IDHs at that time. 2) Although in-hospital infection rate seems to have increased between 2002 and 2012, this is because the data for 2012 include those from the hospitals that opened after 2002 (thus, these new hospitals were not included in the average for 2002). The figures for individual hospitals all show a steady decrease in infection rate.

3) Emergency centers

Table 10 shows major indicators (all classified as operation indicators). All of these indicators show improvement. Considering this together with qualitative information that was collected to supplement some indicators that had low reliability, it can be said that the functions of IDHs were enhanced.

In each city, the emergency center, which was targeted under this project, processes emergency calls and provides instructions. Ambulances are dispatched from the emergency center or emergency stations located in several areas in the city (mostly at hospitals). As shown in Table 10, the average values of service radius and emergency response time met the requirements, but the reliability of the data is not sufficiently high (see Notes 1 and 2 of Table 10). Nevertheless, several emergency centers commented in the interviews that the increased number of ambulances equipped

with life-saving appliances made it possible to concurrently respond to multiple emergency cases and, thus, shortened the response time.

"The number of ambulances," "the number of times of emergency transportation" and "the number of times of dispatch of ambulances" significantly increased after the project, which was directly influenced by the procurement of ambulances conducted through this project. There are not many cases of transportation related to infectious diseases, nor the transportation using negative pressure ambulances that can handle infectious disease cases. However, the interviewed emergency centers explained that negative pressure ambulances must be prepared to respond to sudden outbreaks of infectious diseases even though there are not many occasions where they are required. To maintain the condition of the vehicle, negative pressure ambulances are also used for non-emergency transportation. Additionally, some ambulances procured in this project had since ceased functioning as ambulances for rescue service after years of use[15].

Table 10: Operation and Effect Indicators (Emergency centers)

Average of responses from emergency centers	Baseline	Target	Actual	Actual
	2002	2006	2012	2014
	Baseline Year	Completion Year	Completion Year	2 Years After Completion
1) Service radius (km)*1	Required: 14 Actual: 15	Not mentioned	Required: 22 Actual: 26	Required: 23 Actual: 27
2) Emergency response time (minutes)*2	Required: 6 Actual: 5	Not mentioned	Required: 4 Actual: 3	Required: 3 Actual: 3
3) Number of times of emergency transportation (case)	3,100	Not mentioned	6,769	6,790
Of which are related to infectious disease	37	Not mentioned	16	17
4) Number of ambulances (vehicle)	6	Not mentioned	14	14
Of which were procured under this project	0	Not mentioned	6	6
5) Number of negative pressure ambulances (vehicle)	0	Not mentioned	2	2
Of which were procured under this project *3	0	Not mentioned	0.4	0.4
6) Number of times of dispatch of ambulances (case)	3,797	Not mentioned	8,364	9,141
Of which were by negative pressure ambulances	0	Not mentioned	51	34

Sources: JICA documents; responses from targeted institutions (valid responses from 13 institutions).

Notes: 1) The interviewed institutions explained that the "required" values are set by each prefectural city depending on population and area. The actual average values do not make a great deal of sense because the service radius in Jiaozuo, Sanmenxia, and Shangqiu is very large. In relation to whether each emergency center met its required service radius, all but one had met its requirements as of 2014. Nevertheless, such data are yet to accurately show the effects of the project since there were opinions such as "the actual value is naturally within the required value because requirements must always be complied with."

2) Time from receiving a call to dispatch. However, the reliability of the data is questionable as there were comments similar to the one mentioned in 1) above.

3) The number of negative pressure ambulances is a decimal below 1 as it is the average of the answer for "one ambulance" and "no ambulance (any longer)." (Under this project, every emergency center procured one ambulance.)

[15] According to the interviewed emergency centers, national regulations state that the operating life of an ambulance used for pre-hospital rescue service is eight years. The ambulances procured under this project were delivered in 2004 and replacement commenced in 2012. It was explained that many of them had ceased functioning as ambulances and were now used as general vehicles.

3.3.2 Qualitative Effects

(1) Strengthening of infectious disease control

In addition to the effects described in "3.3.1 Quantitative Effects (2) Enhancement of infectious-disease-control functions of individual institutions," after they procured networking equipment through this project such as servers, CDCs became capable of promptly reporting the occurrence of a disease and of sharing related information through the Internet. In China, a nationwide infectious disease surveillance system was developed in 2004 that included a web-based direct-reporting system involving the participation of medical institutions at each administrative level. The equipment procured through this project contributed to the improvement of the network environment of CDCs, which plays a central role in the surveillance system at provincial and lower levels (together with servers and other equipment that all of the targeted institutions additionally installed after this project had completed).

Another effect is that the different types of targeted institutions coordinate on responding to an occurrence of an infectious disease in such a way that the emergency center first responds to the case, the CDC confirms the case and provides instructions, and the patient is transported to the IDH for treatment. For example, in Hebi there was a case that during the outbreak of the new influenza in 2009 a seriously ill patient who was pregnant was transported to the IDH by the negative pressure ambulance and received treatment there using the ICU equipment procured through this project. The mother (the patient) and her baby then recovered and were released from the hospital.

(2) Enhancement of the capacities of personnel related to infectious disease control

The Financial Department, the executing agency, commented that the training provided under this project and the following "Technical Assistance Related to ODA Loans" enhanced the awareness of public health and the capabilities of the province, prefectures, and counties as a whole. Additionally, the CDCs that the evaluator visited acknowledged that the training was practical as it was provided through the use of equipment (procured through this project) that they would actually be using in the field. According to the executing agency, the personnel trained in the process of the project would continue to play key roles in the frontline against infectious disease and public health crisis in the province.

3.4 Impacts

3.4.1 Intended Impacts

The intended impact, namely, "contributing to the improvement of the health status of local residents" was achieved. The case fatality rate of Class A and Class B infectious diseases (the number of deaths per 100 patients)[16] decreased from 0.42% in 2002 (before implementation of this project) to 0.38% in 2012 (the project completion year) and to 0.34% in 2014 (the ex-post evaluation year). The executing agency commented that there have been no large outbreaks of

[16] One of the operation and effect indicators set at the appraisal. The other indicator was "case fatality of emergency patients" but, according to the executing agency and targeted institutions, no data were collected for this indicator.

infectious disease for the past ten years as a result of the functioning system of prevention, emergency response, and treatment; a system in which this project played an important role. The functions and activities of the institutions targeted by this project, as shown in "3.3 Effectiveness," are considered to have contributed to such a situation[17].

3.4.2 Other Impacts

No negative impacts were observed. In relation to impacts on the natural environment, all targeted institutions reported that there are no issues in this regard as they dispose of medical waste at medical-waste-disposal centers in their respective prefectures and effluent is treated in accordance with the prefectural regulations. Regarding land acquisition, vacant lots of public land were used for all cases of relocation and/or the new construction of the facilities of the sixteen targeted institutions (10 CDCs and six IDHs), thus involving no resettlement or compensation.

As positive impacts other than those already stated so far, it was observed that the facilities and equipment of the emergency centers and some hospitals were also used for general public health cases that were not related to infectious diseases. First, the emergency center equipment improved emergency response capability not only in regard to infectious diseases but also various other emergent events (diseases and accidents). When the Great Sichuan Earthquake occurred in 2008, 70 ambulances and emergency examination and processing vehicles procured through this project were dispatched from Henan Province to conduct rescue operations.

As mentioned in "3.2.1 Project Outputs," in Luoyang, the Second Hospital of Henan University of Science and Technology, the targeted hospital, became a general hospital. It was observed that the testing and diagnosis equipment procured through this project was utilized for diagnosis and treatment of non-infectious diseases in Luoyang.

As stated above, this project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The operation and maintenance (O&M) of the facilities and equipment developed under this project is conducted by each targeted institution under the supervision of the Henan Provincial People's Government (PHFPC), in accordance with the plan made at the appraisal.

A common management system for public health and infectious diseases throughout China (Box 1) has also been implemented in Henan Province. While the basic structure of the system is same as the one designed at the time of appraisal, it was reinforced with a more detailed specification of requirements.

[17] It was also commented from the executing agency that as a result of the upgrading of service quality of IDHs, serious contagious disease patients need not to go to large hospitals for examination and treatment as they did in the past, which helps avoid possible disease spreading in the process of patient transfer.

The allocation of personnel in each targeted institution is mostly in accordance with government regulations. Some targeted institutions, mostly CDCs, highlighted the insufficient number of staff but they acknowledged that there were no cases where they could not conduct their duties due to a lack of manpower.

In this way, the O&M system is secured and future prospects are high as no factors that necessitate major changes were found. Therefore, it can be concluded that there is no problem in relation to the institutional aspects.

Box 1: Management system for public health and infectious diseases

The public health management system and the mechanisms of command and coordination, information exchange, and inter-agency cooperation have been developed based on the requirements stipulated in the Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases (amended in 2004) and the Sudden Acute Infectious Disease Prevention and Control Strategy (2007). The basic structure of the system is common throughout China: PHFPCs/Public Health and Family Planning Bureaus at provincial, prefectural and county levels make decisions on policies and responses to outbreaks of infectious diseases. CDCs at provincial, prefectural, and county levels undertake practical operations, such as the collection of information for decision-making. Hospitals and emergency centers are regarded as implementing agencies for reporting and treatment of cases of outbreaks of infectious diseases.

In the sector of the commanding cooperative mechanism, the health and family planning commissions at all levels shall organize consultation expert groups to collect epidemic information when there is sudden occurrence of epidemics, appraise risks, and create a prevention plan (practical operations are conducted by the CDC). Additionally, the provincial PHFPC gives instructions to the public health and family planning sections at lower administration levels to conduct epidemiological investigation, laboratory diagnosis and treatment, and also supports the local government of the area where the disease occurred in relation to emergency response operations.

In the sector of information exchange mechanism, the health and family planning commissions/CDCs at all levels shall develop a mechanism for information exchange with related departments, regularly report on the epidemic situation in China and abroad and the progress of prevention and control operations, and collect information on sudden acute infectious diseases through sources such as quarantine at the borders and surveillance in foreign countries. This is all performed in order to identify trends of infectious diseases. Additionally, information feedback is provided from the CDC to medical institutions and from laboratories to practitioners of clinical treatment.

In the sector of departmental cooperation mechanism, the health and family planning commissions/CDCs at all levels shall develop cooperation mechanisms for health, agriculture, forestry and border quarantine, to jointly examine prevention and control measures against serious sudden and acute infectious diseases, to monitor epidemic situations, and to develop a framework of cooperation for prevention and control.

Sources: responses from the executing agency and documents provided by the executing agency.

3.5.2 Technical Aspects of Operation and Maintenance

In relation to the technical skills required to operate infectious disease control, as described in "3.2 Efficiency" and "3.3 Effectiveness," all targeted institutions have operated smoothly and produced satisfactory results.

To acquire the requisite technical skills to operate and maintain procured equipment, staff from all of the targeted institutions received training on the O&M of the equipment acquired as a result of this project and also participated in other training courses held after this project had completed, such as courses provided by equipment manufacturers. According to the executing agency, administrative orders require staff to regularly receive technical training even after project completion. The 47 targeted institutions that provided specific answers to the questionnaire all responded that the "skill level of the staff in charge of the O&M of the medical (or testing) equipment is sufficient," and "manuals and usage records of the equipment are well prepared/recorded."

At the time of appraisal, it had been highlighted that some of the equipment to be procured may be too advanced (i.e., there was a risk of a mismatch between the equipment and the levels of medical care and infrastructures). At the time of the ex-post evaluation, it was confirmed that no such situation occurred.

Consequently, the requisite O&M skills are present in the institutions and the future prospects are high as no factors for major changes were found. Therefore, it can be concluded that there is no problem in relation to the technical aspects.

3.5.3 Financial Aspects of Operation and Maintenance

(1) CDCs

CDCs are fully financed by government funds. Although the division between the central and local government funds is not clear, the executing agency commented that there is no financial problem in any CDC as it has secured its necessary budget from either level of the government. The amount of funding assigned to the targeted institutions that provided budgetary data has increased over the past three years and the disbursement was almost same or larger than the amount initially requested.

Table 11: Budget of CDCs

(Unit: million yuan)

	2011	2012	2013
Provincial CDC			
Requested	45.60	50.50	55.00
Disbursed	45.48	49.42	54.71
Prefectural CDC average (10 institutions)			
Requested	10.76	13.44	14.57
Disbursed	14.16	15.62	17.10

Source: responses from targeted institutions (11 institutions)

(2) IDHs

Public IDHs in Henan Province are all non-profit medical institutions, some of which are 100% subsidized by the government and some operates with both financial subsidies from the government and business income (operating revenue). The majority of revenue for all of the nine IDHs that provided budgetary data is operating revenue. For all of these, their budget has increased for the past three years and revenue and expenditure is almost balanced. All of these IDHs answered that "the financial situation is adequate," and the executing

Table 12: Revenue and expenditure of IDHs

(Unit: million yuan)

(Average)	2011	2012	2013
Revenue	29.43	34.38	37.63
Doctor's fee	15.77	26.38	28.59
Subsidies	3.28	3.93	4.32
Expenditure	26.91	32.68	36.01
Balance	2.51	1.70	1.62

Source: responses from targeted institutions (9 institutions)
Note: There are rounding errors.

agency explained that, even among the IDHs that did not respond to the questionnaire, there is no hospital that cannot provide services due to a lack of budget.

(3) Emergency centers

Emergency centers are fully financed by government funding. Of the 13 centers that provided budgetary information (of which five centers provided data on the actual amount), all but one center answered that their financial conditions are adequate. For the center that answered that it had an insufficient budget and those that did not provide answers, the executing agency explained that there is no center that cannot provide services due to a lack of budget. The budget amount has increased for the past three years and the disbursement was the same or larger than the amount initially requested.

Table 13: Budget of emergency centers

(Unit: million yuan)

(Average)	2011	2012	2013
Requested	1.11	1.25	1.45
Disbursed	2.69	3.05	3.62

Source: responses from targeted institutions (5 institutions)

Consequently, the O&M budget for the targeted institutions is secured and the future prospects are high as no factors for major changes were found. Therefore, it can be concluded that there is no problem in relation to financial aspects.

3.5.4 Current Status of Operation and Maintenance

O&M of laboratory equipment is conducted by the personnel in charge of individual laboratories (or, in the case of large equipment, in charge of each set of equipment). These individuals conduct daily checks and record the condition of the equipment in the record book whenever the equipment is used. In all of the 17 institutions visited by the evaluator it was observed that all equipment had unique identification numbers attached; the record books were well prepared, either on paper or a computer; and the usage and conditions of each set of equipment was recorded for the entire period from the time of installation to dates near the date of the evaluator's visit for the ex-post evaluation.

In case of a breakdown of equipment, the manufacturer, supplier, or third-party repair agents are commissioned to conduct the necessary repair work. Some institutions were not satisfied with the insufficient after-sale services of certain manufacturers, as some refused to visit an institution in a distant place to repair just one piece of equipment. In general, however, the executing agency and targeted institutions said that there were no major problems in relation to the O&M of the equipment.

A number of the equipment procured under this project has exceeded their estimated service lives and replacement of these pieces has been performed. Such equipment is replaced when necessary, and maintenance of the replaced equipment is also properly conducted. No issues were reported in relation to acquiring spare parts as they are stocked or purchased when necessary. However, the bacteria identification analyzers, one type of expensive equipment mainly procured

by CDCs, have been unusable since approximately 2013 even though they are still in good condition. This is because the manufacturer discontinued production of the necessary reagents. Consequently, the CDCs had no choice but to purchase the successor model. According to the targeted institutions, this device is essential but produced by only one manufacturer. Therefore, this situation is considered to be inevitable.

Consequently, the O&M status of the targeted institutions is mostly good and the future prospects are mostly high. Therefore, it can be concluded that there is no problem in this respect.

Overall, no major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance systems. Therefore, sustainability of the project effects is high.

4. **Conclusion, Lessons Learned and Recommendations**

4.1 Conclusion

This project was to develop the facilities, equipment, and the human resources of the core organizations related to infectious disease control in Henan Province; namely, CDCs, IDHs and emergency centers. This was performed with the objective of strengthening control of infectious diseases in the province as part of China's efforts to improve public health infrastructures that had been accelerated since the outbreak of SARS in 2002. The relevance of the project's implementation was high as the project's objective was consistent with China's development policies and development needs for improving its public health service system, including upgrading its infectious disease control capabilities. The project's efficiency was evaluated to be fair because, while the project cost was within the planned expenditure, the project period significantly exceeded the timetable, mainly due to delays in the procurement of equipment. The project's effectiveness and impact were evaluated to be high as it was observed that the target institutions had strengthened their respective capacities, specifically: (i) CDCs improved their testing and networking for infectious disease control; (ii) IDHs improved their ability to accept patients as well as their level of testing and treatment; and (iii) emergency centers improved their ability to promptly respond to emergency cases. Furthermore, through improved coordination among these institutions, integrated response to infectious diseases, e.g., occurrence of a disease, identification, transportation, and treatment, was strengthened and, thus, contributed to a reduction in the case fatality rate of infectious diseases in Henan Province. The sustainability of the project's effects was also evaluated to be high, as there were no serious problems in relation to the institutional, technical, and financial aspects, nor with regard to the current operation and maintenance status of the developed facilities and equipment.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

There are no specific points to be improved. It is expected that the executing agency and targeted institutions continue the replacement of equipment that is already ongoing and which will become more intensified from now on, allowing the level of infectious disease control that was confirmed as accomplished at the time of the ex-post evaluation to be continuously maintained and further enhanced.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

The selection of equipment to procure based on a standard equipment list in a setting where a number of subprojects concern the procurement of various types of equipment

In the planning stage of this project (when the equipment procurement list was prepared), the executing agency and the 53 sub-project implementing agencies developed a list of equipment to be procured for each type of targeted institution. Each list consisted of basic equipment and recommended equipment. With information such as what equipment each facility already possessed at that time and what equipment they required, each institution selected necessary equipment from the list. This led to high level of utilization of the equipment procured by each targeted institution and a provision of services in accordance with the nation's requirements. Additionally, most of the procurement packages were implemented smoothly enough for large-scale procurement, although bidding and delivery were delayed. An underlying factor can be the clearly-defined objective of the procurement (i.e., what capacity was specified as the one that must be strengthened) as the infectious disease control had been regularized and standardized through the Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases.

Therefore, a project where a number of subprojects are tasked with procuring various types of equipment can prepare a standard list of equipment to procure, as this project did, in line with the standard (or policy) of the country/sector. Then, it can select the necessary equipment for each subproject by considering the needs of individual institutions or creating a list for each subproject that is based on the standard list with necessary adjustments made (i.e., add or omit items). To a certain extent, such a method would make it possible to conduct procurement in a standardized manner and would lead to a high degree of utilization of the procured equipment that are required and appropriate.

It should be noted as well that in order to enable such a mechanism to work, full consideration should be made to the configuration of the equipment to be listed, and flexibility of adjusting the list should be ensured so that it can cope with frequent model changes of equipment.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs		
(1) Procurement of equipment	2,857 pieces at 19 CDCs 2,747 pieces at 17 IDHs 802 pieces at 17 emergency centers	2,508 pieces at 19 CDCs 2,873 pieces at 17 IDHs 836 pieces at 17 emergency centers
(2) Civil works (New construction or expansion)	82,309m^2 for 19 CDCs 208,088 m^2 for 17 IDHs	76,689 m^2 for 18 CDCs 166,403 m^2 for 16 IDHs 3,000 m^2 for one emergency center
(3) Training	660 persons from 19 CDCs 1,099 persons from 18 IDHs	1,095 persons from 19 CDCs 1,037 persons from 17 IDHs 3,677 persons from 17 emergency centers
2.Project Period	March 2004 – December 2006 (34 months)	March 2004 – August 2012 (102 months)
3.Project Cost		
Amount paid in Foreign currency	5,016 million yen	4,699 million yen
Amount paid in Local currency	1,922 million yen (124 million yuan)	1,525 million yen (109 million yuan)
Total	6,938 million yen	6,249 million yen
Japanese ODA loan portion	5,016 million yen	4,635 million yen
Exchange rate	1 yuan = 14.3 yen (As of August 2003)	1 yuan = 14.0 yen (Average between 2003 and 2012)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Public Health Project (Hebei Province)"

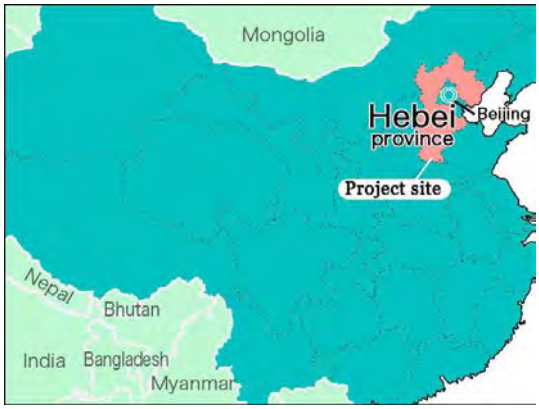
External Evaluator: Ayako Nomoto, International Development Center of Japan Inc.

0. Summary

This project was implemented to reinforce China's public health system, for which their improvement efforts had been accelerated since the outbreak of the Severe Acute Respiratory Syndrome (hereinafter referred to as "SARS"). The project aimed at strengthening the infectious disease countermeasures by procuring equipment, implementing training for personnel involved with infectious disease countermeasures, and other considerations at 13 prefecture-level city (hereinafter referred to as "city") basic public health institutions. The project has been consistent with China's development policy and development needs for infectious disease countermeasures, as well as with Japan's ODA policy. Therefore, relevance of the project is high. Project cost was higher than planned due to escalating construction costs. The project period also significantly exceeded the plan, as it took time to complete a bidding procedure. Therefore, efficiency of the project is low. After project implementation, testing capacity, and capacity of testing, diagnosis, and treatment were enhanced at Centers for Disease Control and Prevention (hereinafter referred to as "CDC") and infectious disease hospitals, respectively. The overall function of infectious disease countermeasures in the province was also strengthened, as early emergency responses became possible. As a result, health of the local residents from Hebei improved, and therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance systems, as well as the current status of operation and maintenance. Therefore sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location

A color ultrasonic diagnostic machine procured at the Hengshui No.3 People Hospital

1.1 Background[1]

The number of cases of legally-designated infectious diseases had decreased in China. However, the appearance of emerging infectious diseases and the problem of public health in rural areas, where the incidence of infectious diseases was still high, continued to be a critical issue in the health sector. Under such circumstances, the Severe Acute Respiratory Syndrome (SARS) broke out in November 2002. The spread of SARS revealed the vulnerability of the public health infrastructure, evidenced by the flaws in the information network and vigilance system, lack of maintenance and aging of various medical facilities, insufficient quantity and quality of health personnel, and lack of capital investment.

Given such a situation, the Chinese government took actions for improving the public health infrastructure by drawing up a master plan targeting the entire country, including programs such as the "Plan for the Construction of Disease Prevention and Control Systems" and "National Plan for the Construction of Medical Treatment Systems in Case of a Public Health Emergency," and embarked on the establishment of a surveillance network, establishment of an emergency system, improvement of the disease prevention and control system, and other such measures to enhance the basic infrastructure for public health.

1.2 Project Outline

The objective of this project is to strengthen infectious disease countermeasures in Hebei province by procuring equipment, implementing civil works and training for the development for personnel involved with the infectious disease countermeasures at prefecture-level city (city) basic public health institutions, thereby contributing to the improvement of the health of the local residents.

Loan Approved Amount/ Disbursed Amount	1,908 million yen/1,906 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2004/March, 2004	
Terms and Conditions	Interest Rate	1.5 % (0.75% for the training component)
	Repayment Period (Grace Period)	30 years (40 years for the training component) (10 years)

[1] The project "Public Health Project" was planned and implemented in 10 provinces including Hebei.

	Conditions for Procurement: General untied
Borrower / Executing Agency	The Government of the People's Republic of China/Hebei Provincial Peoples Government
Final Disbursement Date	August, 2012
Main Contractor (Over 1 billion yen)	-
Main Consultant (Over 100 million yen)	-
Feasibility Studies, etc.	Feasibility study: Feasibility Study Report on Hebei Province Public Health Infrastructure Japanese Government Loan Project (China NORENDAR International, June, 2004)
Related Projects	【Technical Cooperation】 - Poliomyelitis Control Project (1991–1999) - National Public Health Policy Plan Management Project (Technical Assistance Related to ODA Loans) (2012–2016) 【Grant Aid】 - Expanded Program on Immunization (1998) - Program for Tuberculosis Control in Disadvantaged Areas (2000) 【Other donors, agencies】 - The World Bank: Infectious and Endemic Disease Control Project (1991–2002) - The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) : Nationwide Expansion of Directly Observed Treatment, Short Course to Fight the TB Epidemic in China - British Department for International Development (DFID)/Canadian International Development Agency (CIDA): Province, City and County-level Hospital Medical Equipment (1998–2002)

The target facilities of the project are city level Centers for Disease Control and Prevention (CDC) and infectious disease hospitals in nine cities (Tangshan, Handan, Chengde, Hengshui,

Qinhuangdao, Langfang, Cangzhou, Shijiazhuang, and Baoding). The outline of the project (procured equipment, civil works, and training) is as follows:

(1) CDCs (seven city CDCs): Laboratory equipment, equipment for health education such as multi projectors, information equipment such as web servers, mobile emergency services—testing laboratories and others.
(2) Infectious disease hospitals (six hospitals): diagnostic equipment such as electrocardiographs, disinfection and treatment equipment, beds, ambulances, ambulance related equipment, and others.
(3) Civil works (funded by the Chinese side) (construction, expansion, renovation etc. for (1) – (2) listed above.
(4) Training for capacity development of personnel involved in the infectious disease measures

2. Outline of the Evaluation Study

2.1 External Evaluator

Ayako Nomoto, International Development Center of Japan Inc.

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – January 2016

Duration of the Field Study: November 12, 2014 – November 29, 2014; March 3, 2015 – March 4, 2015

2.3 Constraints during the Evaluation Study

Data of the ex-post evaluation was collected through a questionnaire survey on all 13 target facilities (all facilities responded to the questionnaires), and visits to nine facilities (four CDCs and five infectious disease hospitals).

3. Results of the Evaluation (Overall Rating: B[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of China

Both the national development plan and provincial health sector plan have prioritized the strengthening of the emergency and disease prevention system including the capacity enhancement of preventing and controlling infectious diseases and public health emergency cases both at the time of appraisal and ex-post evaluation. Therefore, the objectives of the project have been consistent with the development plan.

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[3] ③: High, ② Fair, ① Low

(1) Development plan at the time of the appraisal

China's "10th Five-Year Plan (2001–2005)" aimed at strengthening the emergency and disease prevention systems in urban areas and thereby promoting the monitoring and containment of infectious and endemic diseases. The Government of China also drew up master plans including the "Plan for the Construction of Disease Prevention and Control Systems" and the "National Plan for the Construction of Medical Treatment Systems in Case of a Public Health Emergency," which targeted the whole country, and thereby aimed at establishing a surveillance and emergency response network, and improving the disease prevention and control system.

Provinces in China drew up the "10th Five-Year Plan (2001–2005)" and the "Health Sector 10th Five-Year Plan (2001–2005)." As for the public health sector, the plans aimed at strengthening the disease prevention system, establishment of the sanitary management system, strengthening the information network and diverse surveillance systems, etc.

(2) Development plan at the time of the ex-post evaluation

Under the "12th Five-Year Plan (2011–2015)," the Government of China aimed for the "establishment of a sound, basic public service system." Specifically, the government sought to strengthen professional public health service networks; this can be accomplished by preventing severe infectious, chronic, occupational, endemic, and mental health diseases, as well as improve the capacity to respond to a public health emergency.

For the "Health Sector 12th Five-Year Plan (2011–2015)," the provincial government of Hebei aims at controlling major infectious, endemic, and parasitic diseases. The government also plans to strengthen disease prevention and testing capacity by improving laboratory facilities and equipment at the provincial, city, and county levels.

3.1.2 Relevance to the Development Needs of China

The development needs for enhancing the capacity for controlling infectious diseases have been high both at the time of appraisal and ex-post evaluation.

(1) Development needs at the time of the appraisal

"The number of hospital beds per 1,000 population," which is a representative indicator that measures the level of public health performance, was 2.2 in Hebei province whereas the national average was 2.32 (2002). Further, the figure was far less as compared to that in developed countries such as Japan (14.6 in 2002). The outbreak of SARS revealed the weak public health system of China including poor infectious disease countermeasures. The common challenges each province faced included improper public health facilities, lack of

equipment, aging equipment, insufficient number of health professionals and limited capacity, and an inappropriate information network system and emergency service system.

(2) Development needs at the time of the ex-post evaluation

At the time of the ex-post evaluation, the number of hospital beds per 1,000 population in Hebei province was still lower than the national average (as shown in Table 1). Therefore, the need for strengthening public health countermeasures is still high. The incidence and mortality of class A and B legally-designated infectious diseases (28 diseases)[4] in Hebei province were nearly equal or better than the national average. However, mortality in 2014 was twice as high as the national average (e.g., from dysentery)[5]; therefore, enhancing the capacity to control infectious diseases is still very important. After project implementation, Influenza A (H1N1) (novel influenza) became epidemic in 2009 and thereafter. Thus, public health emergency risk remains, and early detection, identification, and implementation of control measures are still required.

Table 1: Number of hospital beds per 1,000 population

(Unit: bed)

	2002	2013
National average	2.32	4.55
Hebei province	2.2	4.12

Source: Documents provided by the executing agency

Table 2: Incidence of legally designated infectious diseases (Class A and B)

(Unit : Incidence per 100,000 population)

	2002	2013	2014
Incidence of national average	180.14	225.80	207.17
Incidence in Hebei province	152.89	181.60	164.90
Mortality of national average	0.35	1.20	0.11
Mortality in Hebei province	0.0819	0.27	0.23

Source: Documents provided by JICA and the executing agency
Note: The number of Class A and B notifiable diseases was 26 in 2002 and 28 in 2013 and 2014

3.1.3 Relevance to Japan's ODA Policy

The project was highly consistent with Japan's ODA policy at the time of appraisal (2004). The "Economic Cooperation Plan for China" (2001) of the Government of Japan prioritized the engagement in the measures against infectious diseases and the reinforcement of human resources development such as dispatch of experts and acceptance of trainees under the support area of global issues. Additionally, the Japan International Cooperation Agency (JICA)

[4] The "Law on Preventing and Controlling Notifiable Diseases" classifies the legally designated diseases into Class A, B, and C. Plague and cholera, which need urgent response, are classified as Class A. As of 2014, 26 diseases including HIV/AIDS, polio, and viral hepatitis are classified as Class B, and 11 diseases are designated as Class C. The classes are categorized based on the reporting requirements (Refer to 3.3 Effectiveness) and preventive measures.

[5] The incidence of dysentery in Hebei was 16.999 in 2014, while the national average was 13.93.

(then called as the Japan Bank for International Cooperation) prioritized infectious diseases as a global issue, and human resource development of those who will play a key role for development in the "Strategy for Overseas Economic Cooperation." JICA's "Country Assistance Strategy 2003" also listed the need for strengthening the measures against infectious diseases, especially the improvement of public health infrastructure facilities and the development of human resources, as ways to deal with the vulnerability of China's public health system exposed by the sudden increase in the incidence of SARS.

In light of the above, this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

Outputs were produced in keeping with the "Comparison of the Original and Actual Scope of the Project" presented on the last page of the present report. The differences in the original and actual scope are explained below.

(1) Equipment procured as a part of the project

Equipment planned at the time of appraisal was procured mostly as planned (ratio against the plan: 104%). In accordance with the expansion of the CDCs and infectious disease hospitals, the number of beds, mobile emergency - testing laboratories, and others were added. These changes were appropriate because they responded to needs that emerged during project implementation.

Table 3: Comparison of plan and actual of procured equipment

Institutions	Plan (At the time of appraisal)	Actual
CDCs	1,890 items at seven institutions (seven cities). ・Laboratory equipment ・Equipment for health education such as multi projectors and web servers ・Mobile emergency - testing laboratories and others.	1,650 items at seven institutions. Items were procured nearly as planned. However, some items were changed within the scope of the equipment list.
Infectious disease hospitals	1,414 items at six institutions. Diagnostic equipment such as electrocardiographs, disinfection and treatment equipment, beds, ambulances, ambulance related equipment and others.	1,770 items at six institutions. Items were procured nearly as planned. However, some items, such as beds, were changed within the scope of the equipment list.

Source: Documents provided by JICA, by the executing agency and from the questionnaire responses from the executing agency and participating institutions.

(2) Civil works (funded by the Chinese side)

The construction and expansion of seven CDCs were planned at the time of the appraisal, and the actual scope was nearly as planned. The ratio of the construction area against the plan was 97%.

Table 4: Comparison of plan and actual of civil works (funded by the Chinese side)

Institutions	Plan (At the time of appraisal)	Actual
CDCs	67,424m^2 at seven institutions	65,717m^2 at seven institutions

Source: Documents provided by JICA and questionnaire responses from the executing agency and participating institutions.

(3) Training

The number of trainees significantly exceeded the plan (ratio against the plan: 338%). Originally, the training target was only the city CDCs. However, the networked disease prevention and control system required participation at the county and township level divisions. Therefore, the county-level CDC was later included in the target, and the expansion of trainee scope was deemed appropriate[6].

Table 5: Comparison of plan and actual of training

Targets	Plan (At the time of appraisal)	Actual
City CDCs (Domestic training)	1,626 persons	-
Infectious disease hospitals (Domestic training)	1,310 persons	-
Total	2,936 persons	9,935 persons

Source: Documents provided by JICA and questionnaire responses from the executing agency and participating institutions.

3.2.2 Project Inputs

3.2.2.1 Project Cost

A Japanese ODA loan was within the plan, with the actual disbursed amount being 1,906 million yen (against the approved amount of 1,908 million yen). However, the actual total project cost was 5,068 million yen, while the original planned project cost was 3,730 million yen (ratio against the plan: 136%). The project cost exceeded the plan because of escalated construction costs (and related labor) under the funds from China.

[6] As this project was the first Japanese ODA loan project for the provincial government of Hebei, it was difficult to accurately estimate the cost.

Table 6: Comparison of project cost (Plan/Actual)

(Unit: million yen)

	Plan (At the time of appraisal)						Actual					
	Foreign currency		Local currency		Total		Foreign currency		Local currency		Total	
		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion
Equipment	1,619	1,619	0	0	1,619	1,619	1,834	1,834	0	0	1,834	1,834
Civil works	0	0	1,329	0	1,329	0	0	0	3,162	0	3,162	0
Training	0	0	120	120	120	120	0	0	72	72	72	72
Administration cost and others	0	0	361	0	361	0	0	0	0	0	0	0
Price escalation	82	82	3	0	85	82	0	0	0	0	0	0
Physical contingency	87	87	85	0	172	87	0	0	0	0	0	0
Interest during construction	0	0	44	0	44	0	0	0	0	0	0	0
Total	1,788	1,788	1,942	120	3,730	1,908	1,834	1,834	3,234	72	5,068	1,906

Source: Documents provided by JICA and the executing agency

Note: The totals for the columns and rows may not match due to rounding errors.

Exchange rate: At the time of appraisal (August 2003) 1 yuan=14.3 yen

Average of the implementation period (2004-2012): 1 yuan =13.68 yen

3.2.2.2 Project Period

The implementation of this project was planned from March 2004 (loan agreement signing date) to December 2006 (completion of the delivery of the equipment, or completion and handover of civil works) (34 months). However, the actual project period was 101 months from March 2004 (loan agreement signing date) to July 2012 (completion of the delivery of the equipment), which was significantly longer than that planned (ratio against plan: 297%).

The project period exceeded the plan because a delay occurred at each component: equipment procurement, civil works and training. Regarding equipment procurement, procedures for international competitive bidding generally take a while in China. Secondly, it took some time to prepare and amend the bidding documents, as the executing agency did not have experience with international competitive bidding. Implementation of additional procurement also added to the delay. In terms of civil works, it took time to finance material procurement, due to a sharp rise in construction and material costs. Training implementation was delayed because it was difficult to recruit personnel involved with infectious diseases in the midst of a public health emergency (Influenza A (H1N1) in 2009).

Table 7: Comparison of project period (Plan/Actual)

	Plan (At the time of appraisal)	Actual
Loan agreement signing date	March 2004	March 2004
Civil works	January 2003 – December 2006	December 2003 – August 2009
Procurement of equipment	April 2004 – December 2006	September 2004 – July 2012
Training	September 2004 – September 2006	October 2004 – June 2012
Project completion (project period)	December 2006 (34 months)	July 2012 (101 months)

3.2.3 Results of Calculations of Internal Rates of Return (Reference only)

Due to the nature of the project, a quantitative analysis of the internal rate of return (hereinafter referred to as "IRR") was not possible. As the IRR was not calculated at the time of appraisal, IRR calculation was not included in the scope of the ex-post evaluation.

Thus, the project cost was higher than planned, and the project period was significantly longer than planned. Therefore, efficiency of the project is low.

3.3 Effectiveness[7] (Rating: ③)

The extent to which the project objective of "strengthening of infectious disease countermeasures" was achieved was examined in terms of quantitative indicators and qualitative information.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of appraisal, "increase in the number of beds in the infectious disease hospitals (wards)" and "the number of test items of city CDCs" as a result of the overall function improvement were set as operation and effect indicators. In addition, an improvement in disease prevention and control, testing, and treatment and emergency service systems were set as the qualitative effects.

At the time of the ex-post evaluation, the following indicators including the above quantitative and qualitative effects were used to measure the attainment of the project objective of "strengthening of infectious disease countermeasures." (1) As to overall function improvement, (i) the number of beds per population in the infectious disease hospitals (wards) and (ii) improvement in handling of a sudden epidemic were reviewed. (2) As to functional improvement of CDC, (i) the number of test items, (ii) number of samples of the major infectious disease analyzed, (iii) changes in the reporting time of the samples of the major

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.

infectious disease analyzed, and (iv) utilization of equipment were reviewed. (3) The nosocomial infection rate, in-hospital mortality rate, and number of implemented tests were used to measure the functional improvement in the infectious disease hospitals[8].

(1) Overall function improvement

(i) Number of beds per population in the infectious disease hospitals (wards)

At the time of appraisal, the number of beds (per 1,000 population) in the infectious disease hospitals (wards) was 0.04 in Hebei province and the same was expected to be 0.05 after the project implementation. As Table 8 illustrates, after the project implementation, in 2014, the number of beds in infectious disease hospitals (wards) in Hebei province increased to 0.07. After the outbreak of SARS, the Government of China had expanded the facilities of infectious disease hospitals, and the target institutions of the project also expanded the size from 770 beds in total (2002) to 1,685 in total (2014). Thus, the project seems to have contributed to this increase to a certain extent.

Table 8: Number of infectious disease hospital beds in Hebei Province

(Unit: bed)

	Baseline 2002 Baseline Year	Target 2006 Completion Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
Number of infectious disease hospital beds (per 1,000 population)	0.04	0.05	0.068	0.070

Source: Documents provided by JICA and the executing agency

(ii) Improvement in handling of a sudden epidemic (the time required from the onset of an infectious disease to the official reporting)

Table 9 illustrates that the handling of a sudden epidemic (the time required from the onset of an infectious disease to the official reporting) attained the time specified under the law, and improved compared with the situation before the project implementation. This improvement shows that the infectious disease countermeasures were strengthened by this project.

Although the government has strengthened the requirements and development of an on-line infectious disease reporting network system (connecting the national level to the county level

[8] The indicators set at the time of appraisal were (i) the ones which measure part of the functions of the CDCs and infectious disease hospitals and (ii) impact level indicators which measure the overall function improvement. Therefore, it was insufficient to measure the effects of the project appropriately. Based on documents provided by JICA, additional indicators were set at the time of the ex-post evaluation.

ones[9]) has influenced the improvement, the project contributed to this change. As mentioned below (3.3.2 Qualitative Effects), the communication and multimedia equipment procured as a part of this project enabled the participating institutions to connect to the network. This helped improve surveillance functions, sample collection time was shortened by utilizing vehicles procured as a part of the project, and the time required to identify an infectious disease was also shortened by using available laboratory equipment.

Table 9: Time required from the onset to reporting

	Before the project 2002 Baseline Year		Actual 2012 Completion Year		Actual 2014 2 Years After Completion	
	Specified time	Actual	Specified time	Actual	Specified time	Actual
Class A	Urban area: 6 hours Rural area: 12 hours	10 days	Urban area: 2 hours Rural area: 6 hours	7 hours	Urban area: 2 hours Rural area: 6 hours	1 hour
Class B	Urban area: 12hours Rural area: 24hours	10 days	24 hours	7 hours	24 hours	1 hour

Source: Documents provided by the executing agency, and the Public health emergencies and infectious diseases surveillance information report management approach

Notes: (1) The target was not set at the time of appraisal. (2) The specified timeframe was based on the Public health emergencies and infectious diseases surveillance information report management approach (a regulation on the reporting of infectious diseases)

(2) Functional improvement of CDCs

The major duties of CDCs include prevention and control of severe diseases (pathogen analysis, monitoring, and others), vaccination, food hygiene inspection, and others. The appraisal planned to measure the functional improvement of the CDCs in terms of the increase in the number of test items which the central government (the National Health and Family Planning Commission) required the CDCs to carry out.

(i) The number of test items

Table 10 shows that the number of actually implemented test items against the legally set number of items significantly increased compared to the time before project implementation.[10]

[9] The network is being developed nationwide. The onset and identification of an infectious disease is immediately put into the system by an infectious disease hospital or CDC of a city/county level (or even lower level) where the disease originally breaks out and the upper level institutions/CDCs are able to check the situation online, immediately.

[10] The central government (the National Health and Family Planning Commission) designates basic and recommended test items for provincial CDCs and city CDCs, respectively, and requires CDCs to test at 85% or above

The average ratio of actually implemented against legally set basic test items for the target CDCs was 75% in 2014, which was nearly at the same level as the Hebei provincial CDC (which was 74% in 2013). The average ratio of 11 city CDCs (all city CDCs) in Hebei province was approximately 63% in 2013, and the average of the project target institutions surpassed the average of city CDCs[11]. According to interviews with the CDCs, the project particularly contributed to an increase in test items regarding acute epidemics, food borne infectious diseases, waterborne infectious diseases (via Influenza nucleic acid analysis by utilizing real-time fluorescence-based quantitative PCR machine, and others).

Table 10: Number of test items of CDCs

Legally set number of test items				Number of feasible test items (Actual)					
Purpose	Level	2004 At the time of appraisal	2014 At the time of ex-post evaluation	Before the project 2002 Baseline Year	Achievement status	Actual 2012 Completion Year	Achievement status	Actual 2014 2 Years After Completion	Achievement status
All	Basic (city CDC)	236	226	109	46%	166	73%	169	75%
	Recommended (city CDC)	145	133	14	9%	31	23%	40	30%
	Total (city CDC)	381	359	123	32%	197	55%	209	58%

Source: Documents provided by JICA and the questionnaire responses from the city CDCs

Notes : (1) The legally set number of test items was changed in 2004 by the notice of Ministry of Health and the National Development and Reform Commission. Achievement status in 2002 was the proportion of the actual number of test items against the legally set number of test items set before 2004, while achievement status in 2012 and 2014 is the proportion of the actual number of test items against the legally set number of test items set after 2004. (2) The figures of city CDC are the average for seven respondents.

(ii) Number of the samples of major infectious diseases analyzed

Table 11 compares the number of samples of major infectious diseases analyzed before and after the project implementation. It is difficult to simply compare the situation because the number of samples is influenced by the prevalence of infectious diseases; however, the number of samples increased after the project implementation. The project enabled the participating institutions to test items such as influenza and hand-foot-and-mouth disease, for which testing was impossible in the past. These facts suggest that the testing capacity of the CDCs was enhanced.

the basic test items (Basic test items refer to items that must be implemented, while the recommended test items refer to items to be implemented depending on the area's nature and needs). As of 2013, the nationwide average of implemented test items at the provincial CDC was 273, which was 70.54% of the legally set test items. Less than 10 provincial CDCs attained 85%. The average number of implemented test items of the city CDCs, nationwide, was 155, which was 68.58% of the legally set test items (Source: Internal documents from the Hebei provincial CDC).

[11] Source: Internal documents from the Hebei provincial CDC

Table 11: Number of the samples of major infectious diseases analyzed

(Unit: samples)

Infectious diseases	Before the project 2002 Baseline Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
Influenza (Responses: seven institutions)	-	5,806	6,333
Hand-foot-and-mouth disease (Responses: five institutions)	-	6,697	3,332
Measles (Responses: four institutions)	265	523	607

Source: Questionnaire responses from the CDCs
Notes: Sum of responses.

(iii) Changes in the reporting time of the samples of the major infectious diseases analyzed

The reporting time[12] of the samples analyzed was found to reduce significantly owing to the utilization of the equipment procured as a part of the project, which shortened the time required for the isolation and identification of an infectious agent. According to interviews with the CDCs, in particular, the real-time fluorescence-based quantitative PCR machine (used for molecular biological diagnosis) automated and simplified the procedure such that the time needed to identify the agent was shortened.

Table 12: Reporting time of the samples of the main infectious diseases analyzed

(Unit: hours)

Infectious diseases	Before the project 2002 Baseline Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
Influenza nucleic acid analysis （Responses: five institutions ）	-	4.5	3.7
Hand-foot-and-mouth disease nucleic acid analysis (Responses: three institutions)	-	5.2	3.8

Source: Questionnaire responses from the CDCs
Note: Average number of responses.

[12] Time from when a laboratory receives a sample and confirms the test result, to when the result is reported to the epidemiology section of a CDC.

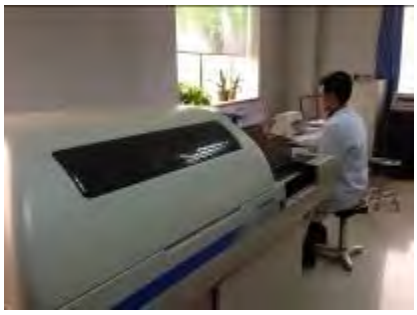
(iv) Utilization of equipment[13]

The equipment procured as a part of the project was well utilized, with some exceptions. As the number of items was large, data regarding utilization rates could only be collected for some machines. However, based on interviews with the CDCs, overall equipment usage was satisfactory. The average utilization rate among respondents of the questionnaire survey for important equipment for infectious disease countermeasures was 91.8%. This included the biological safety cabinet (used for microbial isolation test) listed by several respondents. Utilization of a real-time fluorescence-based quantitative PCR machine and ELIZA reader (used for microbial serological analysis) were the most important items in terms of infectious disease countermeasures. The average utilization rates were 87.5% and 90.8%, respectively. As for the high-priced equipment, the average utilization rate (average of six institutions among seven institutions) for the full automatic microbe (biochemical) analyzer (used for automatic microbial analysis) was as low as 36.3%. According to interviews with the institutions, since the number of samples was small, and running costs were high (batteries, spare parts, reagents, and others), tests were being implemented using alternative approaches (e.g., use of a semi-automatic microbe analyzer, medical agent, and others).

Thus, the procured equipment was generally utilized to a satisfactory level. The increase in the number of test items and the number of samples, and reductions in reporting time indicate that the CDCs' functional testing capacity was strengthened.

A PCR amplification machine procured for the Chengdge CDC

A digital X ray machine procured for the Hengshui No.3 People Hospital



A full automatic biochemical analyzer procured for the Handan Infectious disease hospital.

(3) Functional improvement of the infectious disease hospitals

Functional improvement of the infectious disease hospitals was expected in terms of the test and treatment capacity and nosocomial infection countermeasures.

[13] As the number of equipment procured as a part of the project was great, the evaluation study asked the participating institutions to list three items each, of the high price equipment and the category of important items for infectious disease countermeasures. Interpretation of the utilization rate varied depending on the institutions, such as, "hours the equipment is actually utilized against the expected hours of utilization," "hours the equipment is used against the business hours for a week," etc. However, based on the observation of laboratories and the equipment records, the responses are deemed appropriate.

As Table 13 illustrates, the participating hospitals experienced decreased nosocomial infections and in-hospital mortality rates, as well as significant increases in the number of implemented tests. In terms of nosocomial infection improvements, efforts by the participating hospitals (such as standardized procedures, strict internal control, and training implementation) contributed to these results. It is difficult to attribute any improvement in the nosocomial infection rate (as well as in-hospital mortality rate) solely to this project. However, according to interviews with the hospitals, equipment utilization (such as the digital x-ray machine, color ultrasonic diagnostic machine, and full automatic biochemical analyzer) improved diagnostic accuracy and promptness, thereby contributing to these improved outcomes. As to the significant increase in the number of implemented tests, the participating hospitals were able to handle more tests due to the equipment. Finally, reductions in the time required for test implementation was also observed.

Average testing equipment utilization rates were 87% in 2013 and 71% in 2014. This suggested that the equipment was adequately utilized. In particular, utilization of high priced equipment (such as the digital X-ray machine, color ultrasonic diagnostic machine, full automatic biochemical analyzer, and others) was 92.3%.[14]

Table 13: Nosocomial infection rate, in-hospital mortality rate, and number of implemented tests

Indicators		Before the project Actual 2002 Baseline Year	Actual 2012 Completion Year	Actual 2014 2 Years After Completion
Nosocomial infection rate (%) (average of four respondents)	Infectious disease wards	3.48	2.00	0.70
In-hospital mortality rate (%) (average of three respondents)	Infectious disease wards	0.40	0.33	0.31
Number of implemented tests (total sum of five respondents)	Bacteriological test	1,838	6,816	10,177
	Biochemical test	85,065	146,254	149,098
	Blood test	36,890	83,390	79,230

Source: Questionnaire responses of the participating hospitals

Thus, the overall function of the infectious disease hospitals improved.

[14] For definition of the utilization rate, refer to Footnote 13.

3.3.2 Qualitative Effects

The project specifically contributed to improvements with networking mechanisms in the province, as well as surveillance coverage by procuring communication and multimedia equipment. As shown in section 3.3.1 Quantitative Effects, the on-line infectious disease reporting network system was developed in Hebei province and surveillance coverage (the number of participating institutions) increased. Thus, 39 legally designated diseases have been surveilled successfully. The procured communication and multimedia equipment allowed the participating institutions to share this network system and immediately report information. The rate of institutions above the county level that could connect to the online network in Hebei reached 100% in 2009, which surpassed the national average by 4%. At the township level, the rate in Hebei was 98.86%, which was 28.66% higher than the national average. Thus, the online reporting system in Hebei is now one of the most advanced in the country[15]. The online system-related equipment procured was integral to this improvement.

The project implemented the capacity development of personnel involved in the infectious disease countermeasures, based on the needs of the respective institutions, by dispatching the personnel to institutions in major cities and by holding internal training. According to the interviews with the participating institutions, by participating in training, the testing techniques of laboratory technicians, the sanitary technicians' capacity for health education, and surveillance capacity had been enhanced.

3.4 Impacts

3.4.1 Intended Impacts

Improvement in the health of the local residents, and more specifically, a reduction in the case fatality rates (the percentage of persons diagnosed as having a specified disease who die as a result of that illness), of infectious diseases was set as impact of the project. While data on case fatality rate from infectious diseases was not obtained, mortality and morbidity rates in Hebei province are shown in Table 14. Since the data lack continuity and consistency, it is difficult to compare rates before and after project implementation. However, as Table 2 shows, morbidity and mortality from infectious diseases in Hebei appear to be less than the national average. According to the provincial government, enhanced infectious disease control capacity through this project contributed to the noticeable improvement.

[15] Source: Internal documents from the Hebei provincial CDC and Hebei Daily (January 5, 2009).

Table 14: Mobility and morbidity of infectious diseases

(Unit: per 100,000 population)

	Actual		
	Before the project 2002 Baseline Year	2012 Completion Year	2014 2 Years After Completion
Mortality of infectious diseases (Class A and B)	0.0819	0.221	0.23
Morbidity of infectious diseases (Class A and B)	152.89	184.25	164.90

Source: Documents provided by the executing agency

Note: At the time of appraisal, deaths of emergency patients was set as an operation and effect indicator; however, the executing agency did not have any data on the same, while there was data on mortality (the same situation is found in the Health Statistic Yearbook, 2013).

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

All 13 participating institutions responded to the relevant questionnaire items and reported that both medical waste and discharged wastewater were appropriately processed, with no negative consequences. According to interviews with the participating institutions, medical waste was first processed in a high-pressure sterilizer and then handed over to specialized entities that handle such waste. City governments conducted regular monitoring.

As to the waste water generated in the facilities, all 13 participating institutions responded to the relevant question on the questionnaire and reported that the waste water was processed appropriately and no negative impacts were produced on the natural environment. Interviews with the participating institutions confirmed that city authorities implemented regular monitoring, and that no problem was observed.

(2) Land Acquisition and Resettlement

As planned in the appraisal, no land acquisition and resettlement occurred as a part of the project.

Thus, this project has largely achieved its objectives. Therefore effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The operation and maintenance of the facilities and equipment procured/constructed under the project is carried out by each of the participating institutions (CDCs and infectious disease

hospitals) and monitored by the provincial and city governments, as expected at the time of appraisal.

Staff members are allocated at CDCs based on city population. Conversely, staff are allocated to infectious disease hospitals based on the "Law on Preventing and Controlling Notifiable Diseases." No problems were noticed in terms of staff allocation. However, among the institutions visited, there was an exceptional case whereby the number of actually allocated staff was below the number designated by the population. While that CDC hoped for an increase in staff allocation, there was no major problem reported in terms of that institution undertaking its duties.

The basic management structure of public health in Hebei province is that the respective commission of health and family planning of the province, city, and county (and lower level), is responsible for the prevention and control of infectious diseases, which, as an administrative organization, makes decisions on planning, targeting, and measures. On the other hand, CDCs at various levels (including CDCs at lower levels) perform actual tasks such as reporting the onset, prevention measures, and control. Hospitals and emergency centers are positioned as the executing agencies in charge of reporting, treatment, and response at the onset of infectious diseases.

At the onset of infectious diseases, based on the "Law on Preventing and Controlling Notifiable Diseases" and "Emergency Response Law of the People's Republic of China" the emergency management office of the provincial government activates a plan for the prevention of infectious diseases, and cooperates with various departments in the government (health, education, agriculture, and others) for the control and treatment of the same. The "Law on Preventing and Controlling Notifiable Diseases" and "Public Servants Law" define the relationship among the Provincial Commission of Health and Family Planning and lower entities. In terms of the decision making, the commissions cooperate with the CDC networks, which perform the actual tasks, to manage the situation at each institution at the provincial, city, and county level.

Thus, the operation and maintenance structure, basic institutional set up of the public health management, and the roles of stakeholders at the onset of infectious diseases are clear, and the staff allocation is largely appropriate.

3.5.2 Technical Aspects of Operation and Maintenance

Each participating institution has sufficient technical capacity to perform tasks on infectious disease countermeasures defined under the "Law on Preventing and Controlling Notifiable

Diseases" and others, as well as the capacity to carry out maintenance of the equipment. Each of them implements training for medical staff, technicians, and maintenance staff regularly. Operation manuals and maintenance records are kept and utilized appropriately.

As mentioned in the section on 3.3 Effectiveness [3.3.1 Quantitative Effects, (2) functional improvement of CDCs], the equipment procured was utilized appropriately. There were few cases in which the equipment was not utilized because specifications were too high compared to the technical capacity of the participating institutions. One exception was that the full automatic microbe (biochemical) analyzer was not fully utilized, as the number of samples was small, and running costs were high (batteries, spare parts, reagents, and others). Thus, tests were being implemented using alternative approaches (e.g., semi-automatic microbe analyzer, medical agents, and others). Thus, the equipment did not match technical levels in terms sample numbers. However, even though the number of samples was small, the equipment was justified, as such equipment is necessary in the case of a public health emergency.

Thus, no problems have been observed in the technical capacity as each institution has a system for sustaining/updating technical capabilities and, uses manuals and equipment record appropriately, and the equipment is mostly used appropriately.

3.5.3 Financial Aspects of Operation and Maintenance

CDCs operate with a budget funded 100% by the government. The budget in the past three years shows an upward trend and the budget obtained is nearly the same as the amount initially applied. According to the interviews with the participating institutions, appropriate funds required to fulfill their duties were received.

Table 15: Applied and obtained budget of city CDC

(Unit: 10,000 yuan)

	2011	2012	2013
Applied	1,062	1,206	1,029
Obtained	964	1,065	1,052

Source: Questionnaire responses from the CDCs
Note: Figures are average for seven CDCs

Infectious disease hospitals run with operating revenue, which is the main source of revenue, and with funding from the government. As Table 16 illustrates, the trends for the past three years show that the revenue and expenditure is balanced or surplus is produced.

Table 16: Revenue and expenditure of infectious disease hospitals

(Unit: 10,000 yuan)

	2011	2012	2013
Revenue	7,590	9,876	11,659
Operating revenue	2,832	4,026	4,735
Funding from government	800	863	1,290
Expenditure	7,676	9,589	11,031
Balance	-86	287	628

Source: Questionnaire responses

Notes: (1) Average of six infectious disease hospitals

(2) The breakdown of the revenue does not match the total revenue because revenue from the drug sales was not included in the options. According to the interviews with infectious disease hospitals, drug sales are a big part of the revenue.

Thus, the required funds for operation and maintenance are secured at CDCs and infectious disease hospitals.

3.5.4 Current Status of Operation and Maintenance

The equipment procured as a part of the project is properly maintained at each institution. Daily check-ups are carried out by the users/technicians who keep a record of the status of the equipment. Minor repairs are handled by the section in charge of the equipment, while repair of the large equipment or that which cannot be repaired by the equipment staff is contracted out to agents of the manufacturers and others. Interviews with the participating institutions revealed that there were no problems with the after-sales services or the ability to receive spare parts, and most of the equipment was in good condition. Each institution appropriately renewed their communication and multimedia equipment, which quickly became outdated. Regarding other equipment, although there were no urgent problems with aging equipment, some equipment will need to be renewed in the near future (with appropriate funding). As various special public health funds are disbursed from national, provincial, and city governments, funding problems are not anticipated.

Thus, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system as well as the current status of operating and maintenance. Therefore sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to reinforce China's public health system, for which their improvement efforts had been accelerated since the outbreak of the SARS. The project aimed at strengthening the infectious disease countermeasures by procuring equipment, implementing

training for personnel involved with infectious disease countermeasures, and other considerations at 13 city level basic public health institutions. The project has been consistent with China's development policy and development needs for infectious disease countermeasures, as well as with Japan's ODA policy. Therefore, the relevance of the project is high. Project cost was higher than planned due to escalating construction costs. The project period also significantly exceeded the plan, as it took time to complete a bidding procedure. Therefore, efficiency of the project is low. After project implementation, testing capacity, and capacity of testing, diagnosis, and treatment were enhanced at CDCs and infectious disease hospitals, respectively. The overall function of infectious disease countermeasures in the province was also strengthened, as early emergency responses became possible. As a result, health of the local residents from Hebei improved, and therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance systems, as well as the current status of operation and maintenance. Therefore sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

It is recommended that the target CDCs create a medium-to-long-term equipment renewal plan and consider pooling necessary funds for this renewal. At the same time, CDCs are recommended to share the renewal plan with the city and provincial governments to secure funding. By doing so, it is expected that enhanced infectious disease countermeasure capacity which was confirmed at the time of the ex-post evaluation will be sustained.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

In a case where multiple health equipment items are procured, sufficient analysis of required technical levels, as well as maintenance costs, should be made so that appropriate equipment is selected.

Most equipment procured as a part of the project was effectively utilized. However, at many CDCs, the full automatic microbe (biochemical) analyzers were not sufficiently utilized, as the number of samples was small, running costs were high (consumables, reagents, and others), and spare parts were also costly. Interviews at the ex-post evaluation revealed that CDCs were not fully aware that these expensive maintenance costs were necessary at the time of the appraisal.

At the time of the appraisal, JICA (then called as the Japan Bank for International Cooperation) requested that their Chinese counterparts select equipment after analyzing running costs and determining whether there were sufficient samples for the equipment, and considering whether the specification and equipment match the number of samples. However, procedures for checking the components were not adequate, and the feasibility study did not fully incorporate this aspect.

For projects where multiple health equipment items are procured, during the project planning stage (the feasibility study), it is necessary to collect and present information regarding necessary maintenance costs, and costs for reagents and consumables so that participating institutions are able to select appropriate items.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs		
(1)Procurement of equipment	1,890 items at seven CDCs 1,414 items at six infectious disease hospitals	1,650 items at seven CDCs 1,770 items at six infectious disease hospitals
(2)Civil works	67,424m^2 for seven CDCs	65,717m^2 for seven CDCs
(3)Training	Domestic training :2,936 persons	Domestic training :9,935 persons
2.Project Period	March 2004–December 2006 (34 months)	March 2004–July 2012 (101 months)
3.Project Cost		
Amount paid in Foreign currency	1,788 million yen	1,834 million yen
Amount paid in Local currency	1,942 million yen (135 million yuan)	3,234 million yen (236,418,158 yuan)
Total	3,730 million yen	5,068 million yen
Japanese ODA loan portion	1,908 million yen	1,906 million yen
Exchange rate	1 yuan = 14.3 yen (As of August 2003)	1 yuan =13.68 yen (Average between 2004 and 2012)

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

"Public Health Project (Hubei Province)"

External Evaluator: Ayako Nomoto, International Development Center of Japan Inc.

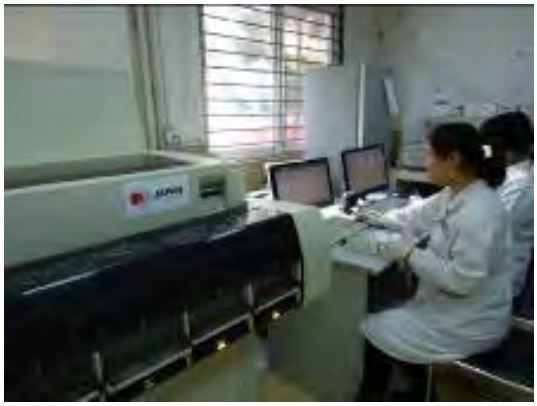
0. Summary

This project was implemented to reinforce China's public health system, for which their improvement efforts had been accelerated since the outbreak of the Severe Acute Respiratory Syndrome (herein after referred to as "SARS"). The project aimed at strengthening the infectious disease countermeasures by procuring equipment, implementing training for the development of personnel involved with infectious disease countermeasures and others at 38 provincial and prefecture-level city (hereinafter referred to as "city") basic public health institutions. The project has been consistent with China's development policy and development needs for infectious disease countermeasures, as well as with Japan's ODA policy. Therefore, relevance of the project is high. The project cost was mostly as planned, however, the project period significantly exceeded that planned, as it took time to complete a series of procedures in bidding and delivery, in addition to the implementation of additional procurement. Therefore, efficiency of the project is fair. After the implementation of the project, its testing capacity, capacity for testing, diagnosis, and treatment, and emergency transportation capacity were enhanced at the Centers for Disease Control and Prevention (herein after referred to as "CDC"), infectious disease hospitals and emergency centers, respectively. Further, the overall function of the infectious disease countermeasures in the province was also strengthened because an early response to the emergency onset of infectious diseases became possible. As a result, the case fatality rate and mortality related to infectious diseases declined, and therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance systems, as well as the current status of operation and maintenance. Therefore sustainability of the project effects is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location



A full automatic biochemical analyzer procured as a part of the project

1.1 Background[1]

The number of cases of legally-designated infectious diseases had decreased in China. However, the appearance of emerging infectious diseases and the problem of public health in rural areas, where the incidence of infectious diseases was still high, continued to be a critical issue in the health sector. Under such circumstances, the Severe Acute Respiratory Syndrome (SARS) broke out in November 2002. The spread of SARS revealed the vulnerability of the public health infrastructure, evidenced by the flaws in the information network and vigilance system, lack of maintenance and aging of various medical facilities, insufficient quantity and quality of health personnel, and lack of capital investment.

Given such a situation, the Chinese government took actions for improving the public health infrastructure by drawing up a master plan targeting the entire country, including programs such as the "Plan for the Construction of Disease Prevention and Control Systems" and "National Plan for the Construction of Medical Treatment Systems in Case of a Public Health Emergency," and embarked on the establishment of a surveillance network, establishment of an emergency system, improvement of the disease prevention and control system, and other such measures to enhance the basic infrastructure for public health.

1.2 Project Outline

The objective of this project is to strengthen the infectious disease countermeasures in Hubei province by procuring equipment, implementing civil works and training for the development of personnel involved with the infectious disease countermeasures at provincial and 13 prefecture-level city (city) basic public health institutions, thereby contributing to the improvement of the health of the local residents.

Loan Approved Amount/ Disbursed Amount	2,325 million yen / 2,263 million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2004 / March, 2004	
Terms and Conditions	Interest Rate	1.5 %
	Repayment Period	30 years
	(Grace Period)	(10 years)
	Conditions for Procurement:	General untied
Borrower / Executing Agency	The Government of the People's Republic of China/Hubei Provincial Peoples Government	
Final Disbursement Date	August, 2011	

[1] The "Public Health Project" was planned and implemented in 10 provinces, including Hubei.

Main Contractor (Over 1 billion yen)	-
Main Consultant (Over 100 million yen)	-
Feasibility Studies, etc.	Feasibility Studies: China National Pharmaceutical Group Corporation–Wuhan Pharmaceutical Design Institute (November, 2003), Wuhan Technical and Economic Engineering Corporation (November, 2003), Wuhan Technical and Economic Engineering Consulting Center (August, 2008)
Related Projects	【Japanese ODA Loan】 - Public Health Infrastructure Facility Improvement Project Post–training (Hubei province) (2012–2013) 【Technical Cooperation】 - Poliomyelitis Control Project (1991–1999) - National Public Health Policy Plan Management Project (Technical Assistance Related to ODA Loans) (2012–2016) 【Grant Aid】 - Expanded Program on Immunization (1998) - Program for Tuberculosis Control in Disadvantaged Areas (2000) 【Other Donors, Agencies】 - The World Bank: Infectious and Endemic Disease Control Project (1991–2002) - The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) : Nationwide Expansion of Directly Observed Treatment, Short Course to Fight the TB Epidemic in China - British Department for International Development (DFID)/Canadian International Development Agency (CIDA): Province, City and County-level Hospital Medical Equipment (1998–2002)

The target facilities of the project are Provincial Centers for Disease Control and Prevention (CDC), provincial infectious disease hospitals and city CDCs, and infectious disease hospitals and emergency centers in 13 cities (Wuhan, Jingzhou, Huangshi, Suizhou, Jingmen, Yichang, Xiaogan, Xianning, Xiangfan, Shiyan, Enshi, Ezhou, and Huanggang). The outline of the project (procured equipment, civil works, and training) is as follows:

(1) CDCs (one provincial CDC and 13 city CDCs): Laboratory equipment, equipment for health education such as multi projectors, information equipment such as web servers, mobile emergency services－testing laboratories and others.
(2) Infectious disease hospitals (one provincial level hospital and 13 city level hospitals): diagnostic equipment such as electrocardiographs, disinfection and treatment equipment, beds, ambulances, ambulance related equipment, and others.
(3) Emergency centers (10 facilities): Ambulances and ambulance related equipment
(4) Civil works (funded by the Chinese side) (construction, expansion, renovation etc. for (1) – (3) listed above.
(5) Training for capacity development of personnel involved in the infectious disease measures (funded by the Chinese side)

2. Outline of the Evaluation Study

2.1 External Evaluator

Ayako Nomoto, International Development Center of Japan Inc.

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – January 2016

Duration of the Field Study: November 30, 2014 – December 21, 2014; March 5, 2015 – March 7, 2015

2.3 Constraints during the Evaluation Study

Data of the ex-post evaluation was collected through a questionnaire survey on all 38 target facilities (all facilities responded to the questionnaires), and visits to 13 facilities (one provincial CDC, four city CDCs, five infectious disease hospitals, and three emergency centers).

Detailed information on the outputs and project costs for China were not obtained, and therefore, efficiency is judged solely based on portion of the Japanese ODA loan.

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of China

Both the national development plan and provincial health sector plan have prioritized the strengthening of the emergency and disease prevention system including the capacity enhancement of preventing and controlling infectious diseases and public health emergency cases both at the time

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[3] ③: High, ② Fair, ① Low

of appraisal and ex-post evaluation. Therefore, the objectives of the project have been consistent with the development plan.

(1) Development plan at the time of the appraisal

China's "10th Five-Year Plan (2001–2005)" aimed at strengthening the emergency and disease prevention systems in urban areas and thereby promoting the monitoring and containment of infectious and endemic diseases. The Government of China also drew up master plans including the "Plan for the Construction of Disease Prevention and Control Systems" and the "National Plan for the Construction of Medical Treatment Systems in Case of a Public Health Emergency," which targeted the whole country, and thereby aimed at establishing a surveillance and emergency response network, and improving the disease prevention and control system.

Provinces in China drew up the "10th Five-Year Plan (2001–2005)" and the "Health Sector 10th Five-Year Plan (2001–2005)." As for the public health sector, the plans aimed at strengthening the disease prevention system, establishment of the sanitary management system, strengthening the information network and diverse surveillance systems, etc.

(2) Development plan at the time of the ex-post evaluation

Under the "12th Five-Year Plan (2011–2015)," the Government of China aims at the "establishment of a sound basic public service system." Specifically, the government aims at strengthening the professional public health service network; preventing severe infectious diseases, chronic diseases, occupational diseases, endemic diseases and mental health; and enhancing the capacity to respond to the public health emergency.

Under the "Health Sector 12th Five-Year Plan (2011–2015)," the provincial government of Hubei aims at strengthening the public health service system in terms of disease prevention and control, health education, maternal and child health, prevention and treatment of mental health, emergency service, hygiene monitoring and control, and prevention and treatment of occupational diseases. The government also aims at strengthening the function of the public health service under the basic medical and health service network.

3.1.2 Relevance to the Development Needs of China

The development needs for enhancing the capacity for controlling infectious diseases have been high both at the time of appraisal and the ex-post evaluation.

(1) Development needs at the time of the appraisal

"The number of hospital beds per 1,000 population," which is a representative indicator that measures the level of public health performance, was 2.1 in the Hubei province whereas the national

average was 2.32 (2002). Further, the figure was far less as compared to that in developed countries such as Japan (14.6 in 2002). The outbreak of SARS revealed the weak public health system of China including poor infectious disease countermeasures. The common challenges each province faced included improper public health facilities, lack of equipment, aging equipment, insufficient number of health professionals and limited capacity, and an inappropriate information network system and emergency service system.

(2) Development needs at the time of the ex-post evaluation

At the time of the ex-post evaluation, the incidence of Class A and B legally designated infectious diseases (28 diseases)[4] in Hubei province was found to be higher than the national average and therefore, the needs for enhancement of the capacity for controlling infectious diseases are high. After the implementation of the project, the Class A legally designated infectious disease, cholera, broke out, and there was an Influenza A (H1N1) (novel influenza) epidemic in 2009 and thereafter (777 cases in 2011 and 217 in 2013). Thus, the risk of the occurrence of a public health emergency is still high, and the early detection, identification, and implementation of control measures for infectious disease need to be carried out.

Table 1: Incidence of legally designated infectious diseases (Class A and B)

(Unit: Incidence per 100,000 population)

	2002	2013
National average incidence	180.14	225.80
Incidence in Hubei province	n.a.	254.81
National average mortality	0.35	1.20
Mortality in Hubei province	0.56	0.73

Source: Documents provided by JICA and the executing agency

Note: The number of Class A and B legally designated infectious diseases was 26 in 2002 and 28 in 2013.

3.1.3 Relevance to Japan's ODA Policy

The project was highly consistent with Japan's ODA policy at the time of appraisal (2004). The "Economic Cooperation Plan for China" (2001) of the Government of Japan prioritized the engagement in the measures against infectious diseases and the reinforcement of human resources development such as dispatch of experts and acceptance of trainees under the support area of global issues. Additionally, the Japan International Cooperation Agency (JICA) (then called as the Japan Bank for International Cooperation) prioritized infectious diseases as a global issue, and human resource development of those who will play a key role for development in the "Strategy for

[4] The "Law on Preventing and Controlling Notifiable Diseases" classifies the legally designated diseases into Class A, B and C. Plague and cholera, which need urgent response, are classified as Class A. As of 2014, 26 diseases including HIV/AIDS, polio, and viral hepatitis are classified as Class B, and 11 diseases are designated as Class C. The classes are categorized based on the reporting requirements (Refer to 3.3 Effectiveness) and preventive measures.

Overseas Economic Cooperation." JICA's "Country Assistance Strategy 2003" also listed the need for strengthening the measures against infectious diseases, especially the improvement of public health infrastructure facilities and the development of human resources, as ways to deal with the vulnerability of China's public health system exposed by the sudden increase in the incidence of SARS.

In light of the above, this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

Outputs were produced in keeping with the "Comparison of the Original and Actual Scope of the Project" presented on the last page of the present report. The differences in the original and actual scope are explained below.

(1) Equipment procured as a part of the project

Equipment procured as a part of the Japanese ODA Loan was almost in keeping with the plan. As the procurement cost was far below the plan as a result of the international competitive bidding, additional equipment was procured by using the undisbursed amount of the loan after the original procurement was completed. Therefore, the number of actual equipment procured exceeded the plan by 172%. Most of the additionally procured equipment was appropriate because they were procured based on the original equipment list that only listed items indispensable for measures against infectious disease. Some additional equipment that were not on the original list were acceptable as they included testing equipment for waterborne infectious diseases and equipment used for the prevention of nosocomial infection or biopsy. Thus, the additional procurement was appropriate as all additional equipment was consistent with the objective of the project and was strongly required.

According to the executing agency, the number of equipment to be procured by counterpart funding from China increased significantly in order to produce synergistic effects with the portion of Japanese ODA Loan. However, the details on the number and items of the equipment were not clear.

Table 2: Comparison of the plan and actual procured equipment

Institutions	Plan (At the time of appraisal)	Actual
CDCs	633 items at 14 institutions (one provincial CDC and 13 city CDC). ・Laboratory equipment ・Equipment for health education such as multi projectors and web servers ・Mobile emergency - testing laboratories and others	911 items at 14 institutions. (Original procurement) Same as planned. (Additional procurement) 278 items. Laboratory equipment based on the original equipment list. However, items such as Liquid Chromatography-Mass Spectrometry, which were not on the list, were procured at the provincial CDC.
Infectious disease hospitals	209 items at 14 institutions. Diagnostic equipment such as electrocardiographs, disinfection and treatment equipment, beds, ambulances, ambulance related equipment and others.	737 items at 14 institutions. (Original procurement) Same as planned. (Additional procurement) 528 items which were procured based on the original equipment list. However, at some hospitals, items not listed in the original equipment list, such as multipurpose anesthesia apparatus, universal operating beds, and high frequency cautery knives, were procured.
Emergency centers	305 items at 10 institutions. Ordinary and negative pressure ambulances, electrocardiographs, and others.	334 items at 10 institutions. (Original procurement) Same as planned. (Additional procurement) 29 items were procured based on the original equipment list.

Source: Documents provided by JICA, by the executing agency, and from the questionnaire responses from the executing agency and participating institutions.

Note: The equipment procured using a portion of the Japanese ODA Loan only. The 14 institutions in the table include provincial and city level institutions.

(2) Civil works (funded by the Chinese side)

Renovation at six institutions was planned and actual scope was almost as planned except that Wuhan city Infectious Disease Hospital was newly constructed after it was amalgamated with another hospitals. Wuhan city Infectious Disease Hospital was merged with Wuhan tuberculosis hospital and Wuhan second tuberculosis hospital and was named as Wuhan Medical Treatment Center. These three hospitals specialized in infectious diseases and therefore, the amalgamation is justifiable.

Table 3: Comparison of plan and actual of civil works (funded by the Chinese side)

Institutions	Plan (At the time of appraisal)	Actual
CDCs	- Three institutions. - Renovation of laboratory (3,452 m^2 at two institutions), reinforcement of power supply facility (one institution)	- 7,402 m^2 at three institutions. - Renovation of laboratory and reinforcement of power supply facility.
Infectious disease hospitals	- Three institutions. - Renovation of outpatients' ward (area was not specified).	- 4,075 m^2 at two institutions. (excluding Wuhan city Infectious Disease Hospital)
Emergency centers	-	-

Source: Documents provided by JICA and questionnaire responses from the executing agency and participating institutions.

(3) Training (funded by the Chinese side)

The dispatch of Japanese experts to China and training in Japan, which were planned at the time of appraisal, were not actually implemented because the participating institutions were unable to bear the costs. However, domestic training was implemented mostly as planned. At the time of appraisal, the components of Japanese experts and training in Japan were incorporated with the strong intention from China; however, the Japanese side considered that institutions in Beijing and Shanghai were able to provide appropriate technical guidance. Therefore, the cancellation of the components did not create a problem.

Table 4: Comparison of plan and actual of training (funded by the Chinese side)

Training/Dispatch of experts	Plan (At the time of appraisal)	Actual
Domestic training	1,025 persons	1,236 persons
Training in Japan	101 persons	Not implemented.
Dispatch of experts (from China and Japan)	—	Not implemented.

Source: Documents provided by JICA and questionnaire responses from the executing agency and participating institutions.

3.2.2 Project Inputs

3.2.2.1 Project Cost

Project cost was judged in terms of the Japanese ODA Loan alone because details of the counterpart funding from China were not clear. The counterpart funding for equipment increased significantly in accordance with the increase in the outputs, as described in the section "3.2.1 Project Outputs" above. However, the details of the outputs were not sufficient to judge whether the increase in the outputs justifies the increase in the costs. As to the counterpart funding for civil works and training, the executing agency did not collect information fully and it was also difficult to collect the information at the ex-post evaluation. Against the loan approved amount of 2,325 million yen, the actually disbursed amount was 2,263 million yen, and thus, the Japanese ODA Loan portion was lower than that planned (the ratio against plan: 97%).

Table 5: Comparison of project cost (Plan/Actual)

(Unit: million yen)

	Plan (At the time of appraisal)						Actual					
	Foreign currency		Local currency		Total		Foreign currency		Local currency		Total	
		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion		ODA loan portion
Equipment	2,128	2,128	449	0	2,577	2,128	2,263	2,263	1,361	0	3,624	2,263
Civil works	0	0	143	0	143	0	0	0	0	0	0	0
Training	98	0	59	0	157	0	0	0	0	0	0	0
Administration cost and others	0	0	109	0	109	0	0	0	40	0	40	0
Price escalation	91	91	2	0	93	91	0	0	0	0	0	0
Physical contingency	106	106	43	0	149	106	0	0	0	0	0	0
Interest during construction	0	0	64	0	64	0	0	0	0	0	0	0
Total	2,423	2,325	869	0	3,292	2,325	2,263	2,263	1,401	0	3,664	2,263

Source: Documents provided by JICA and the executing agency

Notes: (1) The totals for the columns and rows may not match due to rounding errors. (2) The actual amount for civil works and training (both counterpart funding from China) was excluded as the executing agency did not have accurate data.
Exchange rate: At the time of appraisal (August 2003) 1 yuan=14.3 yen;
Average during the implementation period (2004–2011): 1 yuan =13.8 yen

3.2.2.2 Project Period

The implementation of this project was planned from March 2004 (loan agreement signing date) to December 2006 (completion of the delivery of the equipment) (34 months). However, the actual project period was 90 months from March 2004 (loan agreement signing date) to August 2011 (completion of the delivery of the equipment), which was significantly longer than that planned (the ratio against plan: 265%). The cause of the delay was primarily due to the delay in the procurement of the equipment. Additional equipment was procured by using the undisbursed amount of the Japanese ODA Loan. Further, it took time to complete each procedure of bidding, customs, and inspection of imported equipment, as the provincial government of Hubei did not have sufficient experience of international competitive bidding, according to the executing agency.

Table 6: Comparison of project period (Plan/Actual)

	Plan (At the time of appraisal)	Actual
Loan agreement signing date	March 2004	March 2004
Civil works	January 2003–December 2006	January 2004–October 2006
Procurement of equipment	April 2004–December 2006	March 2004–August 2011
Training	September 2004–September 2006	Unclear
Project completion (project period)	December 2006 (34 months)	August 2011 (90 months)

3.2.3 Results of Calculations of IRR (Reference only)

Due to the nature of the project, a quantitative analysis of the internal rate of return (hereinafter referred to as "IRR") was not possible. As the IRR was not calculated at the time of appraisal, IRR calculation was not included in the scope of the ex-post evaluation.

Thus, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[5] (Rating: ③)

The extent to which the project objective of "strengthening of infectious disease countermeasures" was achieved was examined in terms of quantitative indicators and qualitative information.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of appraisal, "increase in the number of hospital beds in the infectious disease hospitals (wards)" and "the number of test items of provincial CDCs" as a result of the overall function improvement were set as operation and effect indicators. In addition, an improvement in disease prevention and control, testing, and treatment and emergency service systems were set as the qualitative effects.

At the time of the ex-post evaluation, the following indicators including the above quantitative and qualitative effects were used to measure the attainment of the project objective of "strengthening of infectious disease countermeasures." (1) As to overall function improvement, (i) the number of beds in the infectious disease hospitals (wards) per population and (ii) improvement in handling of a sudden epidemic were reviewed. (2) As to functional improvement of CDC, (i) the number of test items, (ii) number of samples of major infectious diseases analyzed, (iii) changes in the reporting time of the samples of major infectious disease analyzed and (iv) utilization of equipment were reviewed. (3) The nosocomial infection rate, in-hospital mortality rate, and number of implemented tests were used to measure the functional improvement in the infectious disease hospitals. (4) The service radius, emergency response time, and number of emergency transportation cases were used to measure the functional improvement of the emergency centers[6].

(1) Overall function improvement

(i) Number of beds per population in the infectious disease hospitals (wards)

At the time of appraisal, the number of beds (per 1,000 population) in the infectious disease hospitals

[5] Sub-rating for Effectiveness is to be put with consideration of Impact.

[6] The indicators set at the time of appraisal were (i) the ones which measure part of the functions of the CDCs and infectious disease hospitals and (ii) impact level indicators which measure the overall function improvement. Therefore, it was insufficient to measure the effects of the project appropriately. Based on documents provided by JICA, additional indicators were set at the time of the ex-post evaluation.

(wards) was 0.06 and the same was expected to be 0.07 after the project implementation. As Table 7 illustrates, after the project implementation, in 2014, the number of beds in infectious disease hospitals (wards) in Hubei province increased to 0.08. After the outbreak of SARS, the Government of China had expanded the facilities of infectious disease hospitals, and the target institutions of the project also expanded the size from 1,044 beds in total (2002) to 2,022 in total (2014). Thus, the project seems to have contributed to this increase to a certain extent.

Table 7: Number of infectious disease hospital beds in Hubei Province

(Unit: bed)

	Baseline 2002 Baseline Year	Target 2006 Completion Year	Actual 2011 Completion Year	Actual 2014 3 Years After Completion
Number of beds (per 1,000 population) in the infectious disease hospitals (wards)	0.06	0.07	0.08	0.08

Source: Documents provided by JICA and the executing agency

(ii) Improvement in handling of a sudden epidemic (the time required from the onset of an infectious disease to the official reporting)

Table 8 illustrates that the handling of a sudden epidemic (the time required from the onset of an infectious disease to the official reporting) attained the time specified under the law, and improved compared with the situation before the project implementation. This improvement shows that the infectious disease countermeasures were strengthened by this project.

Although the strengthening of the requirements by the government and development of an on-line infectious disease reporting network system connecting the national level facilities to the county level ones[7] have influenced the improvement, the equipment as a part of the project also contributed to speeding up the response to the onset of infectious diseases. Communication and multimedia equipment procured as a part of the project supported the participating institutions to share the network system mentioned above, and they were able to communicate/report the information to stakeholders, including the upper level institutions/CDCs, immediately. The sample collection time was shortened by utilizing vehicles procured as a part of the project, and the time required to identify an infectious disease was also shortened by utilizing the laboratory equipment as mentioned in the later section on changes in the reporting time of the samples of the major infectious diseases analyzed.

[7] The network is being developed nationwide. The onset and identification of an infectious disease is immediately put into the system by an infectious disease hospital or CDC of a city/county level (or even lower level) where the disease originally breaks out and the upper level institutions/CDCs are able to check the situation online, immediately.

Table 8: Time required from the onset to reporting

	Before the project 2002 Baseline Year		Actual 2011 Completion Year		Actual 2014 3 Years After Completion	
	Specified time	Actual	Specified time	Actual	Specified time	Actual
Class A	Urban area: 6 hours Rural area: 12 hours	The specified time is strictly followed	Urban area: 2 hours Rural area: 6 hours	The specified time is strictly followed	Urban area: 2 hours Rural area: 6 hours	The specified time is strictly followed
Class B	Urban area: 12hours Rural area: 24hours	The specified time is strictly followed	24 hours	The specified time is strictly followed	24 hours	The specified time is strictly followed

Source: Documents provided by the executing agency, and the Public health emergencies and infectious diseases surveillance information report management approach

Notes: (1) The target was not set at the time of appraisal. (2) The specified timeframe was based on the Public health emergencies and infectious diseases surveillance information report management approach (a regulation on the reporting of infectious diseases)

(2) Functional improvement of CDCs

The major duties of CDCs include prevention and control of severe diseases (pathogen analysis, monitoring, and others), vaccination, food hygiene inspection, and others. The appraisal planned to measure the functional improvement of the CDCs in terms of the increase in the number of test items which the central government (the National Health and Family Planning Commission) required the provincial and city CDCs to carry out.

(i) The number of test items

Table 9 shows that the number of actually implemented test items against the legally set number of test items of provincial and city CDCs significantly increased compared with the situation before the project implementation. The central government (the National Health and Family Planning Commission) designates the basic and recommended test items for provincial and city CDCs, respectively[8], and requires CDCs to test 85% or above of the basic test items. Both the provincial and city CDCs achieved the same, and an enhancement of the testing capacity was observed. According to the interviews with the participating CDCs, particularly, an increase in test items was observed under (a) tests on acute epidemics, food borne infectious diseases, and waterborne infectious diseases,

[8] Basic test items refer to items that must be implemented, while the recommended test items refer to items to be implemented depending on the area's nature and needs.

(b) tests on infectious diseases such as viruses, mycoplasma, and chlamydia, and (c) bacteriological testing. Some of the testable items were added because of the introduction of the equipment procured as a part of the project, such as real-time fluorescence-based quantitative PCR machine and full auto microbial analyzer, and thus, the effect of the project was observed.

Table 9: Number of test items

Legally set number of test items				Number of feasible test items (Actual)					
Purpose	Level	2004 At the time of appraisal	2014 At the time of ex-post evaluation	Before the project 2002 Baseline Year	Achievement status	Actual 2011 Completion Year	Achievement status	Actual 2014 3 years After Completion	Achievement status
All	Province Basic	396	387	287	72%	336	87%	336	87%
	Province Recommended	30	46	21	70%	27	59%	27	59%
	Province Total	426	433	308	72%	363	84%	363	84%
	City Basic	236	226	163	69%	189	84%	199	88%
	City Recommended	145	133	54	37%	59	44%	68	51%
	City Total	381	359	216	57%	248	69%	266	74%

Source: Documents provided by JICA and the questionnaire responses from the provincial and city CDCs

Notes: (1) The legally set number of test items was changed in 2004 by the notice of Ministry of Health and the National Development and Reform Commission. Achievement status in 2002 was the proportion of the actual number of test items against the legally set number of test items set before 2004, while achievement status in 2011 and 2014 is the proportion of the actual number of test items against the legally set number of test items set after 2004. (2) The figures of city CDC are the average for 11 respondents.

(ii) Number of samples of major infectious diseases analyzed

Table 10 compares the number of samples of major infectious diseases analyzed before and after the project implementation. It is difficult to simply compare the situation because the number of samples is influenced by the prevalence of infectious diseases; however, the number of samples increased after the project implementation. The project enabled the participating institutions to test items such as influenza and hand-foot-and-mouth disease, for which testing was impossible in the past. These facts suggest that the testing capacity of the CDCs was enhanced.

Table 10: Number of samples of major infectious diseases analyzed

(Unit: samples)

Infectious diseases	Before the project 2002 Baseline Year	Actual 2011 Completion Year	Actual 2014 3 Years After Completion
Influenza (Responses: 11 institutions)	100	8,264	14,190
Hand-foot-and-mouth disease (Responses: five institutions)	-	2,306	2,906
Measles (Responses: four institutions)	65	146	445
AIDS (Responses: four institutions)	2,491	16,617	10,287

Source: Questionnaire responses from the CDCs

Notes: (1) Sum of responses. (2) Only the provincial CDC tested influenza before the project.

(iii) Changes in the reporting time of the samples of the major infectious diseases analyzed

The reporting time[9] of the samples analyzed was found to reduce significantly owing to the utilization of the equipment procured as a part of the project, which shortened the time required for the isolation and identification of an infectious agent. According to the interviews with the provincial and city CDCs, in particular, the real-time fluorescence-based quantitative PCR machine (used for molecular biological diagnosis) automated and simplified the procedure such that the time needed to identify the agent was shortened.

Table 11: Changes in the reporting time of the samples of the major infectious diseases analyzed

(Unit: hours)

Infectious diseases	Before the project 2002 Baseline Year	Actual 2011 Completion Year	Actual 2014 3 Years After Completion
Influenza nucleic acid analysis (Responses: nine institutions)	89	5	4
Hand-foot-and-mouth disease nucleic acid analysis (Responses: six institutions)	7	5	4
Measles nucleic acid analysis (Responses: three institutions)	16	4	4

Source: Questionnaire responses from the CDCs

Note: Average number of responses (provincial and city CDCs).

[9] Time from when a laboratory receives a sample and confirms the test result, to when the result is reported to the epidemiology section of a CDC.

(iv) Utilization of equipment[10]

The equipment procured as a part of the project was well utilized, with some exceptions. Specifically, the utilization rate of the real-time fluorescence-based quantitative PCR machine, ELIZA readers (used for microbial serological analysis), incubators (used for microbial culture), and biological safety cabinet (used for microbial isolation test) were as high as 80 to 100%, which shows that the equipment procured as a part of the project was utilized sufficiently. The exceptions include the multipurpose high-power microscope (used for microbial analysis), which was used 34% times, by an average of five respondents [refer to section 3.5 Sustainability (3.5.4 Current Status of Operation and Maintenance) for the reasons for the low utilization].

Thus, the equipment procured as a part of the project was fully utilized, and the increase in the number of test items and number of samples, and reduction in the reporting time for the samples analyzed showed that the functional testing capacity of the CDCs was strengthened.

A real-time fluorescence-based quantitative PCR machine at the Huanggang city CDC

A digital x-ray equipment at Wuhan Medical Treatment Center

The Huanggang City Emergency Center

(3) Functional improvement of the infectious disease hospitals

Functional improvement of the infectious disease hospitals was expected in terms of the test and treatment capacity and nosocomial infection countermeasures.

As Table 12 illustrates, the participating hospitals experienced an improvement in the rate of nosocomial infections and in-hospital mortality rate, as well as a significant increase in the number of implemented tests. As to the improvement of the nosocomial infection rate, efforts by the participating hospitals, such as standardized procedures, strict internal control, and implementation of training, contributed to the results. Therefore, it is difficult to attribute the improvement in the nosocomial infection rate as well as in-hospital mortality rate to this project solely. However, according to the interviews with the hospitals, equipment items for nosocomial infection prevention,

[10] As the number of equipment procured as a part of the project was great, the evaluation study asked the participating institutions to list three items each, of the high price equipment and the category of important items for infectious disease countermeasures. Interpretation of the utilization rate varied depending on the institutions, such as, "hours the equipment is actually utilized against the expected hours of utilization," "hours the equipment is used against the business hours for a week," etc. However, based on the observation of laboratories and the equipment records, the responses are deemed appropriate.

such as the ultraviolet sterilizer and air sterilizer, contributed to the improvement in the nosocomial infection and in-hospital mortality rates. In addition, utilization of equipment, such as the digital x-ray equipment and color ultrasonic diagnostic equipment, improved the accuracy and promptness of diagnosis, and thereby contributed to the improvement in the nosocomial infection and in-hospital mortality rates. As to the significant increase in the number of implemented tests, the participating hospitals were able to handle more tests with the equipment procured as a part of the project. Finally, reduction in the time required for test implementation was also observed.

Both ICU and testing equipment were utilized well, with a utilization rate of 81% and 92%, respectively (in 2014). As to the questions on the utilization of the equipment under the high price equipment category and the category of important items for infectious disease countermeasures, many hospitals listed the color ultrasonic diagnostic equipment, full automatic biochemical analyzer, and PCR machine, with a utilization of 99%, 95%, and 90%, respectively[11].

Table 12: Nosocomial infection rate, in-hospital mortality rate, and number of implemented tests

Indicators		Before the project Actual 2002 Baseline Year	Actual 2011 Completion Year	Actual 2014 3 Years After Completion
Nosocomial infection rate (%) (average)	All wards	4.19	4.25	3.00
	Infectious disease wards	3.68	3.04	1.94
In-hospital mortality rate (%) (average)	All wards	1.00	0.73	0.50
	Infectious disease wards	1.92	0.87	0.46
Number of implemented tests (total sum)	Bacteriological test	15,767	24,181	119,506
	Biochemical test	95,542	274,707	328,062
	Blood test	94,830	312,471	445,456

Source: Questionnaire responses of the participating hospitals
Note: Responses from 12 institutions

Thus, the function of the infectious disease hospitals improved.

(4) Functional improvement of the emergency centers

Service radius (radius of the area under the responsibility of an emergency center or emergency

11 For definition of the utilization rate, refer to Footnote 10.

station, or a branch of the center, where a small radius is considered to allow a faster emergency service) and emergency response time (average time required from the report of a request for emergency transportation to the arrival at the scene/site) were used to measure the enhancement of the prompt response of the emergency service, and the number of emergency transportations was used to measure the enhancement of the transportation capacity. Thus, the overall functional improvement of the emergency centers was measured.

As Table 13 shows, the service radius and emergency response time satisfied the requirements, and the number of responses to ambulance calls increased. Although the number of services of the negative pressure ambulance (an ambulance designed to be used for infectious disease cases by lowering the atmospheric pressure inside the transportation cabin) was limited, the negative pressure ambulances were used for the transportation of severely ill patients in cases such as the novel influenza, hand-foot-mouth disease, and a suspected patient of Ebola hemorrhagic fever. Thus, the functional improvement of emergency centers was observed in terms of the promptness of the emergency services and enhancement of the transportation capacity owing to the procurement of ambulances, negative pressure ambulances, and ambulance related equipment.

Table 13: Service radius, emergency response time, and number of emergency transportation

Indicators	Before the project 2002 Baseline Year		2011 Completion Year		2014 3 Years After Completion	
	Requirement	Actual	Requirement	Actual	Requirement	Actual
Service radius (km)	32	34	34	32	40	39
Emergency response time (minute)	19	17	10	11	8	8
Number of emergency transportation (case)	-	3,057	-	7,250	-	7,839
Infectious diseases among the whole number (case)	-	57	-	126	-	244

Source: Documents provided by JICA and questionnaire responses of the emergency centers
Notes: (1) Average of eight emerging centers
(2) The number of emergency transportation cases includes the negative pressure ambulance services.

3.3.2 Qualitative Effects

The project implemented the capacity development of personnel involved in the infectious disease countermeasures, based on the needs of the respective institutions, by dispatching the personnel to institutions in major cities and by holding internal training. According to the interviews with the participating institutions, by participating in training, the testing techniques of laboratory technicians, the sanitary technicians' capacity for health education, emergency response to patients, and

surveillance capacity had been enhanced.

A training program was carried out under "Public Health Infrastructure Facility Improvement Project Post-training (Hubei province)" in 2012 and 2013. The content of the program, which was developed by Wuhan University, was very systematic and relevant with the use of the equipment procured as a part of this project. The Provincial Commission of Health and Family Planning of Hubei and the participating institutions highly appreciated the program, which had a synergetic effect with this project.

3.4 Impacts

3.4.1 Intended Impacts

Improvement in the health of the local residents, and more specifically, a reduction in the case fatality rate related to infectious diseases were set as indicators of the impact of the project. The case fatality rate (the percentage of persons diagnosed as having a specified disease, who die as a result of that illness), mortality, and morbidity of Class A and B infectious diseases in Hubei province have been illustrated in Table 14. All indicators show downward trends after the project implementation. This trend cannot be attributed to this project alone and no severe outbreaks of infectious diseases occurred in Hubei province. However, the early detection of infectious diseases was made possible by this project, and according to the Provincial Commission of Health and Family Planning, enhancement of the capacity of infection disease testing, diagnosis and treatment, and prevention of spread of infectious diseases by using the procured ambulances contributed to this outcome.

Table 14: Case fatality rate, mortality, and morbidity of infectious diseases

	Actual		
	Before the project 2002 Baseline Year	2011 Completion Year	2014 3 Years After Completion
Case fatality rate of infectious diseases (Class A and B) (%)	0.36	0.31	0.32
Mortality of infectious diseases (Class A and B) (per 100,000 population)	0.5647	0.8229	0.5555
Morbidity of infectious diseases (Class A and B) (per 100,000 population)	175.41	280.3555	219.159

Source: Documents provided by the executing agency

Note: At the time of appraisal, deaths of emergency patients was set as an operation and effect indicator; however, the executing agency did not have any data on the same, while there was data on mortality and case fatality rate (the same situation is found in the Health Statistic Yearbook, 2013).

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

No negative impacts were observed on the natural environment as a result of this project. In accordance with the laws in China, the project was not required to prepare an environmental impact evaluation report and obtain an approval on the same, because the main component of the project was equipment procurement and civil works that majorly involved the renovation of laboratories alone.

All 32 participating institutions that responded to the relevant question on the questionnaire reported that the medical waste discharge was appropriately processed and no negative impacts were produced. According to the interviews with the participating institutions, medical waste was first processed in a high pressure sterilizer and then handed over to specialized entities that handle medical waste. Regular monitoring was conducted by city governments.

As to the waste water generated in the facilities, all 31 participating institutions that responded to the relevant question on the questionnaire reported the waste water was processed appropriately and no negative impacts were produced on the natural environment. Interviews with the participating institutions confirmed that city authorities implemented regular monitoring, and that no problem was observed. The Huanggang and Xianning CDCs did not have their own treatment facilities because both these CDCs were constructed before the national standard on laboratory construction was established in 2003. However, they treated the waste water with chemical agents, and the discharged water met the required standards. Both these CDCs plan to construct new buildings shortly, which have appropriate water treatment facilities.

(2) Land Acquisition and Resettlement

As planned in the appraisal, no land acquisition and resettlement occurred as a part of the project.

Thus, this project has largely achieved its objectives. Therefore effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The operation and maintenance of the facilities and equipment procured/constructed under the project is carried out by each of the participating institutions (CDCs, infectious disease hospitals, and emergency centers) and monitored by the provincial and city governments, as expected at the time of appraisal.

Staff is allocated at CDCs and emergency centers based on the population of the province and cities,

while staff is allocated at infectious disease hospitals, based on the "Law on Preventing and Controlling Notifiable Diseases." No problem was found on staff allocation. However, there was an exceptional case in which the number of actually allocated staff was below the number designated according to the population. At one CDC, the staff allocation was not appropriate as the number of laboratory technicians was far below that in other CDCs, and the ratio of the laboratory technicians with reference to the total number of personnel was also low. As a result, some high price equipment procured as a part of the project (such as multipurpose high power microscope) was not fully utilized. Therefore, further expansion of the test items is limited[12].

The basic management structure of public health in Hubei province is that the respective commission of health and family planning of the province, city, and county (and lower level), is responsible for the prevention and control of infectious diseases, which, as an administrative organization, makes decisions on planning, targeting, and measures. On the other hand, CDCs at various levels (including CDCs at lower levels) perform actual tasks such as reporting the onset, prevention measures, and control. Hospitals and emergency centers are positioned as the executing agencies in charge of reporting, treatment, and response at the onset of infectious diseases.

At the onset of infectious diseases, based on the "Law on Preventing and Controlling Notifiable Diseases" and "Emergency Response Law of the People's Republic of China" the emergency management office of the provincial government activates a plan for the prevention of infectious diseases, and cooperates with various departments in the government (health, education, agriculture, and others) for the control and treatment of the same. The "Law on Preventing and Controlling Notifiable Diseases" and "Public Servants Law" define the relationship among the Provincial Commission of Health and Family Planning and lower entities. In terms of the decision making, the commissions cooperate with the CDC networks, which perform the actual tasks, to manage the situation at each institution at the provincial, city, and county level.

Thus, the operation and maintenance structure, basic institutional set up of the public health management, and the roles of stakeholders at the onset of infectious diseases are clear, and the staff allocation is largely appropriate.

3.5.2 Technical Aspects of Operation and Maintenance

Each participating institution has sufficient technical capacity to perform tasks on infectious disease countermeasures defined under the "Law on Preventing and Controlling Notifiable Diseases" and others, as well as the capacity to carry out maintenance of the equipment. Each of them implements training for medical staff, technicians, and maintenance staff regularly. Operation manuals and

[12] According to the Provincial Commission of Health and Family Planning, although the achievement rate of the number of test items required is one of the lowest in the province, the rate is the same as the average rate in other provinces, and therefore, the CDC satisfies a certain level.

maintenance records are kept and utilized appropriately.

As mentioned in the section on the effectiveness of the project, the equipment procured as a part of this project is utilized appropriately, and there are few cases in which the equipment is not utilized because the specification is too high compared to the technical capacity of the participating institutions. As an exception, the multipurpose high power microscope was not fully utilized as the average utilization rate of the five respondents was 34%. One of the CDCs interviewed revealed that high priced equipment items such as multipurpose high power microscope and micro full automatic fluorescence Eliza reader were not utilized because of the lack of manpower and technical capacity. However, according to the questionnaire survey and interviews, equipment items which were not utilized comprised only a small part of the items procured as a part of the project (1,982 items in total), and therefore, overall, there is no problem in the use of the equipment.

3.5.3 Financial Aspects of Operation and Maintenance

CDCs and emergency centers operate with a budget funded 100% by the government. The budget in the past three years shows an upward trend and the budget obtained is nearly the same as the amount initially applied. According to the interviews with the participating institutions, appropriate funds required to fulfill their duties were received.

Table 15: Applied and obtained budget of CDC

(Unit: 10,000 yuan)

		2011	2012	2013
Provincial CDC	Applied	15,000	16,000	18,000
	Obtained	15,000	16,000	18,000
City CDCs	Applied	1,861	2,014	2,199
	Obtained	2,099	2,286	2,493

Source: Questionnaire responses from the CDCs
Note: Figures for city CDCs are averages for 10 CDCs

Table 16: Applied and obtained budget of emergency centers

(Unit: 10,000 yuan)

	2011	2012	2013
Applied	536	600	721
Obtained	617	693	840

Source: Questionnaire responses from the emergency centers
Note: Average of seven emergency centers.

Infectious disease hospitals run with operating revenue, which is the main source of revenue, and with funding from the government. The trends for the past three years show that the revenue and

expenditure is balanced or surplus is produced.

Table 17: Revenue and expenditure of infectious disease hospitals

(Unit: 10,000 yuan)

	2011	2012	2013
Revenue	17,151	21,441	25,943
Operating revenue	13,900	17,494	21,126
Funding from the Government	1,142	1,290	1,674
Expenditure	16,858	20,221	23,828
Balance	293	1,220	2,115

Source: Questionnaire responses from the infectious disease hospitals

Notes: (1) Average of 11 infectious disease hospitals

(2) The breakdown of the revenue does not match the total revenue because revenue from the drug sales was not included in the options. According to the interviews with infectious disease hospitals, drug sales are a big part of the revenue.

Thus, the required funds for operation and maintenance are secured at CDCs, infectious disease hospitals, and emergency centers.

3.5.4 Current Status of Operation and Maintenance

The equipment procured as a part of the project is properly maintained at each institution. Daily check-ups are carried out by the users/technicians who keep a record of the status of the equipment. Minor repairs are handled by the section in charge of the equipment, while repair of the large equipment or that which cannot be repaired by the equipment staff is contracted out to agents of the manufacturers and others. Interviews with the participating institutions revealed that there was no problem with the after sales services or procurement of spare parts, and that most of the equipment were in good condition. Although there is no urgent problem of aging equipment, some equipment needs to be renewed in the near future. When the equipment was renewed in the past, usually the participating institutions applied to the city governments (the provincial government in case of the provincial CDC and the provincial hospital) for the budget during the annual budgeting. Though the application is not always approved in the year it is applied for, there has been no problem so far, as the budget is obtained in the following year or so. As various special funds on public health are disbursed from the national, provincial, and city governments, no problems are foreseen.

Thus, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system as well as the current status of operating and maintenance. Therefore sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to reinforce China's public health system, for which their improvement

efforts had been accelerated since the outbreak of SARS. The project aimed at strengthening the infectious disease countermeasures by procuring equipment, implementing training for the development of personnel involved with infectious disease countermeasures and others at 38 provincial and city basic public health institutions. The project has been consistent with China's development policy and development needs for infectious disease countermeasures, as well as with Japan's ODA policy. Therefore, relevance of the project is high. The project cost was mostly as planned, however, the project period significantly exceeded that planned, as it took time to complete a series of procedures in bidding and delivery, in addition to the implementation of additional procurement. Therefore, efficiency of the project is fair. After the implementation of the project, its testing capacity, capacity for testing, diagnosis, and treatment, and emergency transportation capacity were enhanced at the CDCs, infectious disease hospitals and emergency centers, respectively. Further, the overall function of the infectious disease countermeasures in the province was also strengthened because an early response to the emergency onset of infectious diseases became possible. As a result, the case fatality rate and mortality related to infectious diseases declined, and therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance systems, as well as the current status of operation and maintenance. Therefore sustainability of the project effects is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Renewal of equipment

Renewal of equipment is expected to be necessary in the coming years, although some equipment has already been renewed. Each CDC, infectious disease hospital, and emergency center is recommended to renew their equipment appropriately, in order to sustain the enhanced capacity for infectious disease countermeasures, which was confirmed at the time of the ex-post evaluation.

(2) Need for proper management of discharged waste water

Some CDCs (the Huanggang and Xianning CDCs) do not have their own treatment facilities due to space constraints. However, no negative impacts were observed on the natural environment as the waste water was treated with chemical agents. Both these CDCs plan to construct new buildings shortly, which will have water treatment facilities. However, the provincial government is recommend to continue monitoring the same to ensure that no negative impacts are produced on natural environment, and to confirm whether the appropriate treatment facilities are constructed at both the CDCs.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

If multiple health equipment items are procured, sufficient analysis of the required technical level should be made so that the appropriate equipment is selected.

Most equipment procured as a part of the project was effectively utilized. However, at some CDCs, it was difficult to fully utilize some equipment due to the constraint in the technical capacity and the number of technicians. Therefore, they were not able to expand the scope of laboratory tests. At the project planning stage (at feasibility study), it is necessary to analyze the technical capacity needed and how staff should be allocated for the effective use of the equipment procured. By doing so, participating institutions will be able to select the appropriate equipment.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
(1)Procurement of equipment	633 items at 14 CDCs 209 items at 14 infectious disease hospitals 305 items at 10 emergency centers	911 items at 14 CDCs 737 items at 14 infectious disease hospitals 334 items at 10 emergency centers
(2)Civil works	6 facilities (renovation of laboratories, outpatient wards, and others)	6 facilities (renovation of laboratories, outpatient wards, and others)
(3)Training	Domestic training: 1,025 persons Training in Japan: 101 persons Dispatch of experts	Domestic training: 1,236 persons
2. Project Period	March 2004–December 2006 (34 months)	March 2004–August 2011 (90 months)
3. Project Cost		
Amount paid in Foreign currency	2,423 million yen	2,263 million yen
Amount paid in Local currency	869 million yen (60 million yuan)	1,401 million yen (101 million yuan)
Total	3,292 million yen	3,664 million yen
Japanese ODA loan portion	2,325 million yen	2,263 million yen
Exchange rate	1 yuan=14.3 yen (As of August 2003)	1 yuan=13.8 yen (Average between 2004 and 2011)