

People's Republic of China

FY2016 Ex-Post Evaluation of Japanese ODA Loan Project

“Higher Education Project (Hebei Province)”

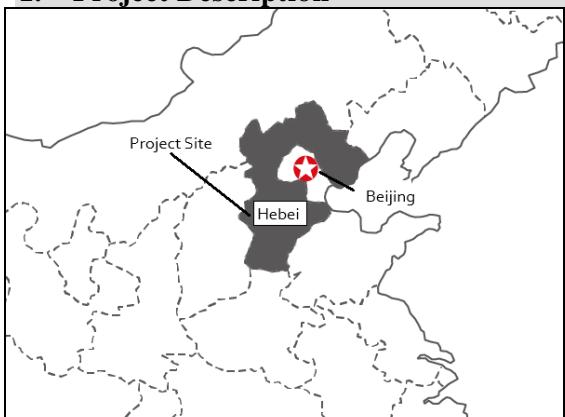
External Evaluator: Toshihiro Nishino, International Development Center of Japan Inc.

## 0. Summary

The project was implemented for the purpose of improving education and research at a total of 14 universities in Hebei Province in China through the improvement of relevant facilities and equipment and the training of teachers. Relevance of the project is evaluated to be high, as the project is consistent with (i) the higher education policies of China and Hebei Province, (ii) the development needs for quantitative and qualitative enhancement of the universities, and (iii) Japan’s assistance policies. Although the effectiveness of the project is somewhat suppressed by the incompleteness of the long-term specialist training, the quantitative as well as qualitative expansion of higher education at the targeted universities is achieved, including the fulfilment of tangible (hard) and intangible (soft) development needs and significant improvement of various educational indicators. The high level of effectiveness and the impacts of the project are also substantiated by the improved outcomes of educational and research activities, making the best use of the advanced equipment and training and by the advancements in the various initiatives designed to achieve regional vitalization, environmental conservation, etc. resulting from such use of equipment and training. Efficiency of the project is evaluated to be fair on the whole: although the project cost is as planned, the project period exceeds the planned period due to delays in procurement. Sustainability is evaluated to be high, with no issues being observed in institutional, technical and financial aspects, and the operation and maintenance of the facilities and equipment developed by the project are in good status.

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

## 1. Project Description



Project Locations



Civil engineering testing system installed under the project (Hebei University of Technology)

## 1.1 Background

In China, the further shift to a market economy due to the promotion of the reform and open door policy since 1978, newly achieved membership of the World Trade Organization, etc. and rise of environmental issues accompanying rapid economic growth made strengthening of educational and research activities pertaining to the field of market rules and environmental issues essential. Moreover, the emerging regional economic gap demanded quantitative and qualitative improvement of higher education through promotion of the local economy in less developed regions and an increased demand for higher education. In response the Government of China adopted such targets as a higher education enrollment rate of 15%, 16 million students in higher education and human resources development to serve the legal, financial, trade and other sectors in its 10th Five Year Plan.

The socioeconomic development of Hebei Province (area of 188,000 km<sup>2</sup>; population of 67.69 million in 2004) lagged far behind other typical coastal provinces. Even though the 10th Five Year Plan for Education in Hebei Province (2001 – 2005) called for an increase of the higher education enrollment rate to 15% by 2005 along with a significant increase of the number of enrolled students, there was wide recognition of the need to deal with the tangible constraint (need to provide more school buildings and equipment), intangible constraint (need to train teachers) and financial constraint for the quantitative and qualitative expansion of higher education in Hebei Province.

## 1.2 Project Outline

The project aimed at quantitatively and qualitatively improving higher education by means of providing tangible assistance (improvement of buildings, equipment, etc.) and intangible assistance (implementation of training for teachers and administrative staff members and other assistance) for 14 targeted universities which would play an important role in the vitalization of communities, strengthening of market rules and environmental conservation in Hebei Province, thereby contributing to the fostering of human resources capable of contributing to the strengthening of market rules, environmental conservation and regional vitalization.<sup>1</sup> The targeted universities are listed below.

Hebei University, Hebei University of Technology, Yanshan University, Agricultural University of Hebei, Hebei Normal University, Hebei Medical University, Hebei University of Science & Technology, Hebei University of Economics and Business, North China University of Science and Technology, Hebei University of Engineering, Hebei North University, Hebei Normal University of Science & Technology, Chengde Medical University and Hebei Women's Vocational College  
(14 Universities)

Note: The university names are those at the time of the ex-post evaluation.

<sup>1</sup> This ex-post evaluation features the work conducted in Hebei Province as part of the Japanese ODA loan project entitled “Inland Higher Education Project” targeting 23 inland provinces, municipalities and autonomous regions in China.

Loan Approved Amount/Disbursed Amount	5,775 million yen/5,557 million yen	
Exchange of Notes Date/Loan Agreement Signing Date	June 2006/June 2006	
Terms and Conditions	Interest Rate Repayment Period (Grace Period Conditions for Procurement	1.5% 30 years 10 years ) General untied
Borrower/Executing Agencies	The government of People's Republic of China / The People's Government of Hebei Province	
Project Completion	September 2013	
Main Contractor(s)	-	
Main Consultant	-	
Feasibility Studies, etc.	<ul style="list-style-type: none"> <li>- "F/S by the Fourth Research and Design Engineering Corporation of China National Nuclear Corporation "(September, 2005)</li> <li>- "Special Assistance for Project Implementation (SAPI) for Higher Education Project in China", Japan International Cooperation Agency (JICA), 2003, 2004 and 2005.</li> <li>- "The Supervision Survey Report on JICA Loaned Higher Education Project", JICA, 2010.</li> </ul>	
Related Projects	-	

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Toshihiro Nishino, International Development Center of Japan Inc.

### 2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: July 2016 - September 2017

Duration of the Field Study: October 30 - November 12, 2016 and March 12 - 18, 2017

## 3. Results of the Evaluation (Overall Rating: A<sup>2</sup>)

### 3.1 Relevance (Rating: ③<sup>3</sup>)

#### 3.1.1 Consistency with the Development Plan of China

The objective of the project was relevant to the national and provincial five year plans, the five year plan for the education sector and other education-related strategies of China at the time of both its appraisal and ex-post evaluation in the sense that the project “aimed at fostering highly capable human resources responding to social needs through the quantitative and qualitative improvement of higher education with a view

<sup>2</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>3</sup> ③: High, ②: Fair, ①: Low

to achieving socioeconomic development and solving the problem of a regional gap".

At the national level, there has been continuous emphasis to foster and expand core and key universities in the Midwestern part of China, and the relevant projects have been implemented.<sup>4</sup> While there have been no major policy changes since the time of project appraisal to the time of ex-post evaluation, the 13th Five Year Plan (2016 – 2020) gives high priority to supporting "a gradual increase of a number of world class universities and disciplines while creating world class universities and disciplines (promotion of construction of first class universities and disciplines".

Table 1: Main Objectives of Development Plans Related to the Project

Type of document	At the time of appraisal	At the time of ex-post evaluation
National level development plan	<u>10th Five Year Plan (2001 – 2005)</u> Increase of the higher education enrollment rate to around 15% by 2005	<u>13th Five Year Plan (2016 – 2020)</u> Improvement of the quality of the workforce and productivity through enhanced national education aiming at becoming a country with strong human resources; continued promotion of the modernization of universities (one numerical target for higher education is a gross enrollment rate of 90% or higher for senior secondary schools)
National level education sector plan	<u>The 10th National Five year Plan for Education (2001–2005):</u> To increase student enrollment in HEIs (higher education institutions) to 16,000,000 by 2005; to develop human resources that have high skills in high technology, biotechnologies, manufacturing technologies etc. that are necessary for industrial structural adjustment; to strengthen support to HEIs that are relatively at a high level in western area; to strengthen support to fostering of teachers.	<u>The 13th National Five year Plan for Education (2016–2020) and National Mid-and Long-term Reform and Development Plan for Education Sector"(2010–2020):</u> Promotion of the development of world class universities and disciplines; strengthening of the development of core and key universities in the Midwestern Region To increase higher education enrollment ratio from 26.5% in 2010 to 40% in 2020
Provincial level education development plan	<u>10th Five Year Plan for Education in Hebei Province (2001 – 2005)</u> (Target) <ul style="list-style-type: none"><li>• Higher education enrollment rate: 15% in 2005; 24% in 2010</li><li>• Number of university students: 900,000 in 2010</li></ul>	<u>13th Five Year Plan for Education in Hebei Province (2016 – 2020)</u> Promotion of the development of first class universities and disciplines; promotion of qualitative improvement and reform of education; enhancement of the general educational level; promotion of the reform of graduate school education (Target) Higher education enrollment rate: 42%

Source: Documents provided by JICA and plan documents

<sup>4</sup> Although Hebei Province does not normally belong to Midwestern China, it is included in the target area in such projects assisting higher education in the Midwest as the "Project for the Promotion of Higher Education in the Midwestern Part (2010 - 2020)".

### 3.1.2 Consistency with the Development Needs of China

Development needs were observed for the quantitative and qualitative enhancement of education at the 14 targeted universities during both the appraisal and ex-post evaluation.

At the appraisal stage, the future need for the quantitative expansion of higher education was predicted (i) in line with the further expansion of primary and secondary education and (ii) to narrow the economic disparity between Hebei and other coastal provinces as mentioned in 1.1 Background. The demand forecast suggested that the number of students enrolled at higher education institutions in Hebei Province would increase by approximately 1.6 times in eight years and the central government was urging the provincial government to strengthen both the tangible (expansion of buildings and equipment) and intangible (training of new teachers) aspects of higher education to respond to such increase of the educational need. The series of interviews for the ex-post evaluation found the common understanding among all of the targeted universities that “at the time of project appraisal, only limited financial assistance was available, failing the introduction or renewal of educational equipment in particular”. As indicated by such understanding, there was a complete lack of funds to procure or renew such equipment at those principal universities controlled by the provincial government and targeted by the project.<sup>5</sup>

The results of the interviews with senior officials and those in charge of the project at the provincial education department and targeted universities at the time of the ex-post evaluation also suggest a continued need for further advancement of the “strengthening of market rules”, maintenance of economic growth through “vitalization of the local economy” and elimination of gaps” (in terms of the GDP per capita, etc.)<sup>6</sup> with other coastal provinces. Meanwhile, “environmental conservation” has become a prioritized area for human resources development and also a target discipline for development because of the increasing need for the implementation of suitable measures against the background of the slow progress of raising environmental awareness and improving the state of air pollution in China. The number of students enrolled in higher education has steadily increased and there is a strong need for the quantitative and qualitative improvement of higher education institutions. There has been an increasing need for high quality human resources at the post-graduate level following ① the successful quantitative expansion of higher education in the 12th Five

---

<sup>5</sup> The financial sources for Chinese universities are subsidies by the central, provincial and other governments and own revenue from tuition fees, etc.

<sup>6</sup> The actual GDP per capita in 2016 was 42,866 yuan for Hebei Province with an average of 70,163 yuan for coastal provinces.

Year Plan period (2011 – 2015) and ② China’s increased economic and industrial levels. As typically represented by the policy of “developing world class universities and disciplines”, the emphasis has shifted from quantitative expansion to qualitative expansion but the overall aim is still the balanced expansion of quantity and quality. Moreover, the targeted universities of the project are core universities of which the development has been assisted by the provincial education department and some of them are subjects of projects for the promotion of higher education in the Midwest Part. As such, the project is relevant to the development needs of both the Government of China and the provincial government of Hebei.

### 3.1.3 Consistency with Japan’s ODA Policy

At the time of appraisal, “Economic Cooperation Program for China” (2001), “Medium-Term Strategy for Overseas Economic Cooperation Operations” (JICA, April, 2002) and “Country Assistance Strategy” (JICA, 2002) all supported China’s reform and open door policy, emphasized the development of human resources from the viewpoint of dealing with the necessary adjustment of economic structure after the entry in WTO and stressed Japan’s assistance for China’s inland area from the viewpoint of redressing disparity. As such, the project was relevant to Japan’s ODA policy. The Country Assistance Strategy upholds “regional vitalization and exchange”, “strengthening of market economy reform”, and “environmental conservation” as key areas of human resource development.

Although Hebei Province is geographically a coastal province, it was selected as the target province for assistance because of ① the relatively backward education conditions of Hebei Province at the time of appraisal as in the case of other inland provinces, making the expansion of higher education an urgent task, and ② the GDP per capita of the province (13,017 yuan in 2004) being far below the average for coastal provinces (27,802 yuan). This decision was in line with Japan’s ODA policy mentioned above.

The project is highly relevant to China’s development plans, development needs at the time of both the appraisal and ex-post evaluation, as well as to Japan’s ODA policy at the time of the appraisal. Therefore, its relevance is high.

## 3.2 Efficiency (Rating: ②)

### 3.2.1 Project Outputs

The actual production of the outputs is summarized in “Comparison of the Original and Actual Scope of the project” of the final page of this report. In regard to the

tangible aspect of the project, the actual building area was smaller than planned because the laboratory building at Hebei University of Technology which was supposed to be constructed with a Japanese ODA loan was constructed with China's own funding to fulfil the "need to build it sooner than planned", diverting the funds earmarked for the ODA loan to the construction of an engineering training centre and civil engineering laboratory. It was assumed at the time of appraisal that the new buildings would be used by important organizations for the promotion of China-Japan exchanges. However, this original objective was not achieved because of the "change of the function of the buildings" at Hebei University of Technology and "failed materialization of the planned Japanese language department and China-Japan women's education research department" at Hebei Women's Vocational College. As the changes in terms of the purpose of the building and building area at Hebei University of Technology corresponded to the changed needs of the university, there were no major problems in relation to the output regarding the construction of the university building. However, because one reason for the selection of the building as the subject for a Japanese ODA loan at the time of appraisal was the eventual use of this building to promote friendly relations with Japan, such use of the building remains to be a pending issue.

In regard to educational equipment, a total of 27 procurement packages<sup>7</sup> were planned and these were duly completed except for some changes explained next. The bidding price for Package No. 1 (computers, etc.) exceeded the target price and rebidding was necessary. As urgently required equipment was procured with China's own funding, the contents of the equipment to be procured were adjusted for this rebidding. The low bidding price for Package No. 24 (Hebei University of Engineering; measuring instruments, etc.) led to the cancelling of the bidding. The successful bidder of the rebidding could not deliver some of the equipment at the bid price due to changes of the foreign exchange rate. As a result, equipment equivalent to some 30% of the contract price was cancelled. This cancelled equipment was eventually provided with the university's own funding. In short, the overall equipment procurement was almost as planned even though minor adjustments were made to the original contents of the planned equipment.

In short, it is safe to conclude that the hard outputs were generally achieved as planned.

---

<sup>7</sup> Of these 27 procurement packages, No. 1 through No. 9 were packages each of which featured specific equipment while each of No. 10 through No. 27 featured a specific university.

Table 2: Actual Buildings Constructed

University	Planned	Actual
Hebei University of Technology	Laboratory building: 25,000 m <sup>2</sup>	Engineering training centre: 4,441 m <sup>2</sup> Civil engineering laboratory: 5,556 m <sup>2</sup> (total: 9,997 m <sup>2</sup> )
Hebei Women's Vocational College	Lecture building (Foreign Language Institute), etc: 15,000 m <sup>2</sup>	Lecture building (foreign language institute), etc: 15,000 m <sup>2</sup> (No change)
Total	40,000 m <sup>2</sup>	24,997 m <sup>2</sup>

Sources: Responses to the questionnaire from the executing agency.



Power plant operation simulation system  
installed under the project  
(Hebei University of Engineering)



Lecture building constructed  
under the project  
(Hebei Women's Vocational College)

Training at Japanese universities was conducted under the project as intangible support for the purpose of enhancing the level of expertise of teachers at the targeted universities (in principle, the targeted university or teacher hoping to receive training was supposed to select the host university or tutor and each trainee was accepted on an individual basis).

Table 3: Actual Training Outputs

	Planned (persons)	Actual output			Actual-Planned ratio	
		Total	Long-term specialist training	Short-term manager training	Total	Long-term specialist training
Actual training outputs	206	181 (incl.37 females)	49 (incl.21 females)	132 (incl.16 females)	88%	24%

Sources: Responses to the questionnaire from the executing agency.

Note: “Long-term specialist training” is to dispatch teachers with specific expertise are individually to host universities in Japan for a long period of time (long-term training of more than one year in a specialist field), while “short-term manager training” usually lasts for less than one month.

The total number of trainees was 181 or 88% of the planned figure (206). When the scope of analysis is limited to the type of training planned at the time of appraisal, i.e.

“dispatch of teachers with a high level of expertise in their fields to Japanese universities on an individual and long-term basis”, the actual number of trainees meeting this criterion was only 49 (24% of the planned number of trainees). Of those who actually underwent training, 132 trainees (73%) participated in a short-term manager training course. The manager training course should serve to complement long-term specialist training, and the outputs of soft component were not realized necessarily as planned. There is a wide variety of factors for the failure of the long-term training to achieve its target at many universities as described in the box below. The biggest factor was the introduction of “stricter rules for trips abroad” by the Government of China.<sup>8</sup>

Factors for Non-Achievement of the Training Target: Common Factors Applicable to All Targeted Universities

- The introduction of “stricter rules for trips abroad” made it very difficult to obtain the approval of public money-funded overseas training from the Provincial Foreign Affairs Office and there were many cases of the denial of approval. (This policy began around 2009 and intensified in late 2011. Approval became almost impossible to receive from 2012).
- As a result of giving priority to introduction of educational equipment by the Hebei Education Department at the time of the project’s commencement, efforts to deal with the soft component (especially long-term specialist training) of the project were delayed. (In addition, as more emphasis was placed on group training than on long-term specialist training, the former was implemented prior to the latter based on the need for the institutional reform, etc. of universities in China.)

Factors for the Non-Achievement of the Training Target: Factors Applicable to Some Universities

- As teachers hoping to undergo trainings searched for suitable Japanese universities on the Internet or through an introduction by an acquaintance, there were cases of mismatching, especially for universities with little experience of exchange with foreign universities.
- Some of the targeted universities were in the midst of expansion and had no leeway to dispatch their teachers abroad for a long period of time.
- Training in Japan was less attractive because of “a noticeable preference for training in Europe or the United States”, “existence of numerous options for study abroad or overseas training,” amongst other reasons.

<sup>8</sup> Foreign trips approved prior to the introduction of the stricter rules could go ahead. As many trainees for a manager training course had submitted their applications relatively early on, they were often successful in obtaining approval despite some unsuccessful applications. The Chinese universities with a relatively high number of long-term specialist trainees achieved such a number because of either ① obtaining of approval relatively early or ② participating in training using a personal passport outside the scope of policy application (most universities do not approve the use of a personal passport because of possible complications in the case of a problem).

In the past, there have been cases where the matching of a Chinese university sending trainees and a Japanese university accepting trainees does not go smoothly in human resources development projects in other provinces. At the time of appraisal, it was assumed that having learned from the past, the selection of trainees from Chinese universities and host universities in Japan would be based on an existing relationship between universities and/or researchers (would-be trainees and tutors) to facilitate smooth and advantageous matching. The interview survey with the Chinese universities involved in the project, however, found that many of these universities had no previous relationship with the host university (even in those cases where past exchanges are said to have existed, the reality was often for a Chinese university to submit the names of the host university to which they hoped to dispatch their teachers using reference materials provided by JICA). There were also cases of planned matching not materializing as a professor (teacher) with a contact with a host university at the time of appraisal had subsequently left or retire from the university by the time of project implementation. Accordingly, the new measure introduced to ensure the proper matching of Chinese and Japanese universities hardly achieved its intended purpose.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

As the actual total cost, including the administration cost, has not been obtained, the comparison between the planned cost and actual cost here is based on the total of the “building construction cost”, “educational equipment cost” and “training cost”. The project cost (excluding the administration cost) of 8,146 million yen (100% of the planned cost) was as planned.

The reduction of the building area at the Hebei University of Technology reduced the local currency portion of the building construction cost. Moreover, the actual training cost was approximately 41% of the planned cost due to a decrease of the number of trainees and shortening of the training period. In contrast, the actual equipment cost slightly exceeded (approximately 3%) of the planned cost. The background for this increase was ① allocation of the surplus funds to Package No. 1 based on (i) saving in the early contracted packages (as a result of international competitive tender) and (ii) cancellation of some equipment packages through the proper procedure (resulting in an increased actual cost of Package No. 1) and ② purchase of educational equipment with the own funding of the Chinese side, as they had been cancelled at the original bidding due to a higher bidding price than the planned price. It is difficult to simply compare the actual cost with the planned cost because of changes in terms of the contents of the construction work, contents of procured equipment and training period.

Nevertheless, the project cost (and the Japanese ODA loan amount) appears to have been adequately adjusted in a manner to reflect the changes of project contents and scale.

Table 4: Comparison between the Planned Cost and Actual Cost

Unit: million yen

	Plan (appraisal)			Actual		
	Foreign currency	Local currency	Total	Foreign currency	Local currency	Total
1. Building Construction	342	413	755	349	367	716
2. Educational Equipment	4,962	2,160	7,122	5,088	2,222	7,310
3. Training	292	0	292	119	0	119
Total	5,596	2,573	8,169	5,557	2,589	8,146

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency.

Notes

- 1) Planned exchange rate: 1 yuan = 13.7 yen (September, 2005)  
Actual exchange rate: 1 yuan = 14.1 yen (mean exchange rate between 2006 and 2013)
- 2) Planned total cost, including contingencies, administration cost, etc. at the time of appraisal: 9,116 million yen (foreign currency portion: 6,377 million yen and local currency portion: 2,739 million yen)

### 3.2.2.2 Project Period

The actual project period was 90 months, exceeding the planned project period of 60 months (150% of the planned period).

Table 5: Planned and Actual Project Periods

	Plan (appraisal)	Actual
Signing of Loan Agreement	June 2006	June 2006
Project period	April 2006 – March 2011 (60 months)	April 2006 – September 2013 (90 months)
Building construction	April 2006 – June 2009	April 2006 – December 2008
Procurement of educational equipment	July 2006 – June 2008	August 2007 – September 2013
Training	October 2006 – March 2011	October 2007 – August 2013

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency.

Note: As part of the project start using Chinese funding before the signing of the loan agreement, the commencement of the project was before this signing.

The biggest factor causing the excess project period was the delayed procurement of educational equipment. Of the 27 packages, Packages No. 1 and No. 24 required rebidding as described earlier, resulting in contract signing in 2011, in turn delaying the completion of the equipment inspection to 2013. Despite this setback, the respective contracts for 23 packages (accounting for 94% of the total contract price) out of 27 packages had been completed by the end of 2007. Therefore, the inspection of most of the equipment was completed within the initial project period (up to June,

2009).

For the purpose of achieving the smooth procurement of educational equipment, “equipment likely to be procured by all universities (computers, etc.)” were procured under the common packages (9 in total) hoping to enjoy a price curb effect of the economy of scale and the rest of equipment were procured through university-specific packages (18 in total) based on the recommendations and lessons learned from past similar projects in China. Although the actual procurement period for the educational equipment under the project exceeded the planned period, the situation was nowhere near the situation observed in other provinces where “the signing of the contract for many packages was considerably delayed” or “much of the planned equipment had not been procured at the end of the original procurement period”. Most of the planned equipment under the project was introduced as planned and educational and research activities using such equipment were generally implemented as planned. Accordingly, this response (adoption of flexible packages) is believed to have significantly contributed to the achievement of the procurement of educational equipment in line with the planned period, assisted by appropriate project management by the Education Department of Hebei.

### 3.2.3 Results of Calculations for Internal Rates of Return

Due to the nature of the project, a quantitative analysis of the internal rate of return was not conducted.

Although the project cost was as planned, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

## 3.3 Effectiveness<sup>9</sup> (Rating: ③)

The effectiveness of the project was analyzed from two aspects: the quantitative aspect, including the performance of operation and effect indicators and the qualitative aspect regarding the qualitative improvement of education and research as determined at the appraisal stage.

### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

#### (1) Quantitative improvement of teaching and research

At the appraisal stage, “the number of students”, “the total building area and “the total monetary value of the educational and research equipment” of the targeted universities were set as quantitative indicators for the improvement of education and

---

<sup>9</sup> Sub-rating for Effectiveness was given with consideration of Impact.

research. As shown in the following tables, Hebei province demonstrated substantial improvements for each indicator. The facilities and equipment developed under the project have been mostly utilized till the present, and it can be said that they have played their role as an integral part of the quantitative expansion of teaching and research.

Firstly, there was a substantial increase in the number of students at each of the targeted universities. The actual total number of enrolled students in 2014, one year after the completion of the project, was 348,000 (94% of the target). Even though this figure was 23,000 below the target figure (371,000), it showed a substantial increase by 94,000 (37%) compared to the baseline (2004). Such a large increase was recorded by most universities.

Table 6: Number of Enrolled Students (Total of Research Students, Full-Time Students and Special Course Students) and Building Area (Lecture Room, Laboratories, Library, Gymnasium and Lecture Hall) (Total of the Targeted Universities)

	Baseline	Target	Actual		
	2004	2012	2012	2014	2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion	One Year after Project Completion	Three Years after Project Completion at the Time of Ex-Post Evaluation
No. of Enrolled Students ('000)	254	371	359	348	358
Building Area ('000 m <sup>2</sup> )	2,557	4,409 (40)	5,014 (25)	5,265 (25)	6,203 (25)

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency

Notes

1) Research students, full-time students and special course students are equivalent to graduate students, undergraduate students and junior college students in Japan respectively.

2) The figure in brackets refers to the building area related to the project.

The building area also considerably increased at each university as in the case of the number of enrolled students. The actual figure for the original target year for completion (2012) set at the time of appraisal of 5,014,000 m<sup>2</sup> (total of all universities) already exceeded the target figure (4,409,000 m<sup>2</sup>) (114% of the target value). From the year of 2004, the building area almost doubled in approximately eight years (increase by 2,457,000 m<sup>2</sup>). The building area showed a continually increasing trend in subsequent years, reaching 5,265,000 m<sup>2</sup> in 2014, one year after project completion, and further to 6,203,000 m<sup>2</sup> in 2016, three years after project completion.

Meanwhile, the total monetary value of educational equipment at the targeted universities also recorded a substantial increase. Even though no target figure for the total monetary value of educational equipment was set at the time of appraisal, the actual value in 2012, i.e. the original target year for completion at the time of appraisal,

was 3,730 million yuan, recording an increase of 2.7 times in approximately eight years from 2004. The rate of equipment value increase exceeded the increase rate for the student number and building area. Both the questionnaire survey and interview survey with each university found that the operating rates of the buildings and equipment provided under the project were both high, indicating their effective use.

Table 7: Total Monetary Value of Educational Equipment  
(Total of the Targeted Universities)

	Baseline	Target	Actual				Unit: million yuan
	2004	2012	2012		2014		2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion		One Year after Project Completion		Three Years after Project Completion at the Time of Ex-Post Evaluation
	For All Universities	Under the Project	For All Universities	Under the Project	For All Universities	Under the Project	For All Universities
Total monetary value of educational equipment	1,390	500	3,730	480	4,950	500	6,200

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency

## (2) Qualitative improvement of teaching and research

At the time of appraisal, two indicators were introduced to indicate “qualitative improvement of education and research”. These were “building area per student” and “monetary value of equipment per student” and their actual performance is shown in Table 8. There was a substantial improvement in this aspect as the size of increases in terms of the building area and equipment value exceeded the increase of the student number as mentioned earlier. The building area per student and equipment value per student (simple average for all of the targeted universities) had already exceeded the respective targets considerably in 2012, the initial target year for project completion (building area per student: 17.4 m<sup>2</sup> compared to the target value of 10.2 m<sup>2</sup>; equipment value per student: 10,580 yuan compared to the target value of 5,847 yuan). Further improvement was made by 2014, one year after project completion.

Table 8: School Building Area per Student and Monetary Value of Educational Equipment per Student

	Baseline	Target	Actual		
	2004	2012	2012	2014	2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion	One Year after Project Completion	Three Years after Project Completion at the Time of Ex-Post Evaluation
School building area per student (m <sup>2</sup> )	10.2	10.6	17.4	21.4	19.7
Value of educational equipment per student (yuan)	5,492	7,241	10,580	14,983	18,458

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency.

Notes

- 1) Simple average of the corresponding values for the targeted universities
- 2) The national standard (for ordinary university departments) varies from one department to another. For example, the standard school building area per student ranges from 9 m<sup>2</sup> for a medical department to 22 m<sup>2</sup> for a social science department while the standard monetary value of equipment per student ranges from 3,000 yuan for a social science department to 5,000 yuan for such science departments as engineering, agro-science and medicine.

Table 9 summarizes the key indicators showing the effects of the quantitative and qualitative expansion of higher education (outcome indicators) among the various indicators for teaching and research activities. While each indicator showed some degree of improvement, noticeable improvement was recorded for a number of doctoral degree programs, number of key laboratories (at both the state level and provincial/ministerial level)<sup>10</sup>, number of research projects (state level) and number of key disciplines (state level). For those indicators for which the target values were set at the time of appraisal, two (number of key disciplines at the provincial/ministerial level and number of master's degree programs) out of four indicators achieved their targets already in 2012, the original year for project completion at the time of appraisal. The target number of doctoral degree programs was achieved in 2014, one year after project completion. The results of interviews with senior officials and those in charge of the project at the targeted universities indicate that the project, in particular the consolidation of educational equipment, significantly contributed to the gaining of the certified status of key disciplines and key laboratories at many universities.

Since the commencement of the project, one college have been upgraded to universities, one university have commenced master's degree programs and two universities have installed doctorate programs.

---

<sup>10</sup> Those designated by a provincial government or ministry, such as the Ministry of Education, are classified as "provincial/ministerial level" while those designated by the state are classified as "state level".

Table 9: Trend of Major Teaching/Research Indicators (Total for the Targeted Universities)

	Baseline	Target	Actual		
	2004	2012	2012	2014	2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion	One Year after Project Completion	Three Years after Project Completion at the Time of Ex-Post Evaluation
Number of key disciplines (state level)	4	24	12	13	13
Number of key disciplines (provincial/ministerial)	77	138	147	177	184
Number of key laboratories (state level)	0	-	4	10	10
Number of key laboratories (provincial/ministerial)	18	-	114	139	164
Number of undergraduate faculties/departments	480	-	702	733	756
Number of master's degree programs	354	750	891	937	1,000
Number of doctorate degree programs	64	220	199	221	222
Number of research projects (state level)	130	-	444	481	642
Number of research projects (provincial/ministerial)	682	-	1,820	1,477	1,806

Sources: Documents provided by JICA, responses to the questionnaire from the executing agency

Note: Those indicators for which the target was not set at the time of appraisal were also included in the indicators to be evaluated.

### 3.3.2 Qualitative Effects (Other Effects)

#### (1) Effects of the hard components

Five positive effects of the hard component (tangible component) of the project were confirmed: ① contribution to being listed among world class universities and disciplines, ② contribution to improved assessment results of the targeted universities by the Ministry of Education, ③ improvement of teaching and research conditions and environment, ④ recruitment of excellent human resources and ⑤ improvement of business scope and social services. These effects are detailed in table 10.

Table 10: Effects of Hard (Tangible) Component

Effect	Description
Contribution to being listed among World Class Universities and Disciplines	<ul style="list-style-type: none"> <li>A world class policy has been adopted in China with the aim of building world class universities and disciplines. In Hebei Province, of the 12 key universities aiming at becoming a world class university, 10 universities (four out of four universities earmarked for the first class and six out of eight universities earmarked for the second class) are targeted by the project. Of the 17 disciplines listed as world class disciplines, seven are priority disciplines for assistance under the project (Chemistry at Hebei University; Biology at Hebei Normal University; Material Chemistry/ Engineering at Hebei University of Technology; Mechanical Engineering and Material Chemistry/Engineering at Yanshan University; Metallurgical Engineering at North China University of Science and Technology; Crop Science at Agricultural University of Hebei). For a university or discipline to be listed as world class, it is essential to have an excellent reputation in terms of both tangible and intangible aspects and the consolidation of the tangible (hard) aspect under the project has greatly contributed to obtaining recognition as world class.</li> </ul>
Contribution of Improved Assessment Results of Universities by Ministry of Education	<ul style="list-style-type: none"> <li>Universities in China are subject to periodic assessment by the Ministry of Education. The level of facilities and educational equipment is an important indicator in this assessment. There are many cases where the consolidation of hardware under the project has contributed to a university passing this assessment or obtaining an excellent assessment score (Hebei Normal University of Science and Technology (passed the assessment of its teaching standard in 2006); North China University of Science and Technology (same as above, 2006); Hebei University (same as above; 2007); Chengde Medical University (same as above; 2007)).</li> </ul>
Improvement of Teaching and Research Conditions and Environment	<ul style="list-style-type: none"> <li>Key equipment as well as expensive equipment required for basic research was installed under the project, establishing a platform for teaching and research at the targeted universities (Hebei Medical University; Hebei University of Economics and Business; Agricultural University of Hebei; North China University of Science and Technology; Chengde Medical University; Hebei Normal University). At the time of introducing equipment, there were cases where the value of the equipment provided under the project exceeded 50% of the total value of equipment at the department or laboratory and analysis centre (section which centrally installs and controls important equipment at the university level).</li> <li>The installation of state-of-the-art equipment which was absent before the project has enabled new research work and experiments (genetic recombination, etc.) The introduction of basic as well as core equipment under the project has enabled wide ranging research work together with the installation of application systems with the own funding of the university.</li> <li>The project has improved the understanding of lessons, etc. on the part of students and the educational effect on the students due to ① the implementation of more integrated and practical teaching and ② increase of (i) number of equipment and (ii) opportunities for training and practical exercises per student.</li> </ul>
Recruitment of Excellent Human Resources	<ul style="list-style-type: none"> <li>By introducing essential equipment for research in the specialist fields of the targeted teachers for recruitment (those who have studied in Japan), such teachers were successfully recruited. As a result, the research level of the universities concerned has improved in terms of better human resources and equipment.</li> </ul>
Improvement of Business Scope and Social Services	<ul style="list-style-type: none"> <li>With the active use of the equipment introduced under the project, it has become possible to establish new disciplines and research departments (Hebei University of Economics and Business; Hebei University of Engineering; Yanshan University)</li> <li>Following the designation as a model college for vocational training for women, new curricula have been introduced for women in rural areas as well as working women. Moreover, mobile classes are arranged to educate women in rural areas (Hebei Women's Vocational College).</li> </ul>

Sources: Responses to the questionnaire from the executing agency

## (2) Effects of the soft component

The findings of the interview survey with senior staff members and those in charge of project implementation at the targeted universities and the beneficiaries survey with the training participants indicated that many of the participants, excluding some universities, found the training that was part of the soft component of the project to be a useful opportunity to learn about the contents of advanced research and education, as it was rare to have the opportunity for long-term overseas training to obtain advanced specialist knowledge.

There were five positive effects of the soft component: ① fostering of the key persons of a university, ② upgrading of the research level and development of research in advanced or new fields hitherto unexplored, ③ strengthening of disciplines and research departments, ④ efforts to tackle social issues and ⑤ improvement of university management. These effects are detailed in Table 11.

Table 11: Effects of Soft Component

Effect	Description
Fostering of key university persons	<ul style="list-style-type: none"> <li>• Many of the training participants are considered to be key persons at their own universities.</li> <li>• Many of them were promoted on their return to China and currently hold important positions, such as professors responsible for key laboratories at a university or department. Moreover, most training participants have written academic papers of various contents since their return to China, utilizing their training outcomes.</li> </ul>
Boosting of the research level and development of research in advanced or new fields previously unexplored	<ul style="list-style-type: none"> <li>• There are many cases where the research level has been enhanced (increase in the production of high-quality academic papers, among other aspects) and research in new fields, etc. has been initiated due to contact with the most advanced research fields and equipment in Japan. As a result, some cases led to upgrading to a state research project or participation in a project organized by an international research body.</li> <li>• According to the beneficiaries survey<sup>11</sup> with the participants of long-term specialist training, the top effects of the training are “upgrading of the research level” (74%), “improvement of the contents of education” (56%), “introduction of new research methods” (40%) and “commencement of research on new themes” (28%).</li> </ul>
Strengthening of Disciplines and Research Departments	<ul style="list-style-type: none"> <li>• There are many cases where training outcomes are used to effectively proceed with such new efforts as the establishment of new disciplines and research departments and strengthening of key disciplines. In several cases, various reference materials obtained in Japan prove to be useful. The improvement of both the hard (tangible) and soft (intangible) aspects under the project has definitely strengthened the disciplines and departments of the targeted universities.</li> </ul>
Efforts to Tackle Social Issues	<ul style="list-style-type: none"> <li>• There are cases where efforts are made with the cooperation of a local government to tackle such social issues as ① traffic congestion and ② problem of drug and stimulant abuse by utilizing the knowledge and know-how obtained in Japan concerning ① traffic simulation model and ② big data analysis.</li> </ul>
Improvements in University Management	<ul style="list-style-type: none"> <li>• According to the interview survey with senior staff members and those in charge of project implementation at the targeted universities and participants in manager training, appreciative opinions were heard that the short-term training course on university management was in line with the “need for promotion of the modernization and improvement of the management level”. There are many cases of the positive use of the training outcomes although the level of such use varies from one university to another.</li> </ul>

Sources: Responses to the questionnaire from the executing agency

### 3.4 Impact

#### 3.4.1 Intended Impacts

##### (1) Enhancement of teaching and research results at the targeted universities

Table 12 outlines the performance of indicators that are believed to represent

---

<sup>11</sup> The beneficiary survey conducted as part of the ex-post evaluation is outlined here. (Target) Participants in training in Japan; (Method) Request to each university via the Provincial Education Department to make former trainees reply to the questionnaire (the selection of subject former trainees to reply to the questionnaire was left to each province and university because of the difficulty of conducting random sampling using a list); (Number of questionnaires sent) 100; (Number of valid responses) 100 (by course, 57 for the specialist course and 43 for the manager course) (by gender, 23 females and 77 males).

enhancement in teaching and research results (impact indicators) among the teaching and research-related indicators.

While improvement was made for each indicator, the actual number of academic papers and actual number of patented research outcomes in 2014, one year after project completion, were double or more than the respective reference figures in 2004, recording very high growth. Most of the universities recorded an improved graduation rate, graduate employment rate and post-graduate enrollment rate.

Such a general improvement of the impact indicators suggests that the quantitative and qualitative improvement of the teaching and research at the targeted universities has led to an overall improvement of the teaching and research results.

Table 12: Trends in Major Teaching/Research Impact Indicators  
(Total of the Targeted Universities)

	Baseline 2004	Target 2012	Actual 2012	Actual 2014	Actual 2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion	One Year after Project Completion	Three Years after Project Completion at the Time of Ex-Post Evaluation
Number of award-winning research (state level)	3	-	2	3	0
Number of award-winning research (provincial/ministerial level)	142	-	288	280	268
Number of patented research outcomes	61	-	347	734	757
Number of research papers (SSCI)	0	-	30	39	32
Number of research papers (SCI/EI/ISTP)	1,206	-	4,812	5,175	3,944
Graduation rate	98.8%	98.9%	98.6%	98.7%	98.1%
Graduate employment rate	85.4%	-	91.0%	90.5%	91.0%
Post-graduate enrollment rate	18.2%	-	19.9%	20.2%	19.8%

Sources: JICA documents, responses to the questionnaire from the executing agency

Notes

1) Those indicators for which the target was not set at the time of appraisal were also included in the indicators to be evaluated.

2) SSCI stands for Social Science Citation Index, SCI for Science Citation Index, EI for Engineering Index and ISTP for Index to Scientific & Technical Proceedings.

**Box: Outcomes at Targeted Disciplines for Assistance by the Project (Contribution of the Project)**

In the past Higher Education projects implemented in other provinces, improvement of universities by China's domestic funding took place after the introduction of educational equipment and building construction with a Japanese ODA loan. As such, it was relatively easy to determine the level of contribution through Japanese ODA loan project. In Hebei province, however, improvement of the universities under the project progressed along with improvement with domestic funding and the level of contribution by the project was not very clear. For this reason, efforts were made by this ex-post evaluation to determine the level of contribution by the project by means of comparing the level of achievement of those disciplines receiving prioritized assistance under the project with the general level of achievement of the targeted universities. Some 42% of the educational equipment procured under the project was provided for key disciplines.

The state of improvement between 2004 and 2014 or 2016 by outcome indicator shows that a strong increase is observed especially of the monetary value of equipment per student for those disciplines receiving prioritized assistance of the targeted universities in general, presumably because of the reflection of the active investment in equipment under the project. However, the other indicators do not show much difference. With some indicators, the rate of increase for key disciplines is lower than that for the targeted universities in general. A similar tendency is observed with the impact indicators and the level of impact varies from one discipline to another. The likely reasons for these results are ① in 2004, the level of each indicator for the key disciplines was already higher than that for other disciplines, ② the introduction of versatile basic equipment which could be used by wide-ranging disciplines and departments at many universities widely benefited disciplines beyond the targeted disciplines, ③ following the improvement of the targeted disciplines under the project, efforts were made to improve other disciplines using domestic funds (to achieve the balanced improvement of all disciplines) and ④ the less than planned performance of the long-term specialist training as described earlier made it difficult for this training to produce the intended outcomes.

In view of the above, it is reasonable to conclude based on the performance of educational and research indicators that the project which was implemented along with improvement work using China's domestic funding contributed to an overall increase of educational equipment, etc. at the targeted universities, thereby contributing to the improvement of these universities (the improvement of each indicator is the combined result of funding under the project and the use of domestic funds).

### (2) Enhancement of teaching and research at the provincial level

The performance of the higher education indicators in Hebei province is shown in Table 13. The provincial level quantitative indicators generally exceeded their respective targets assumed at the time of appraisal except for some indicators, including the number of enrolled students and the graduation rate. As the universities targeted by the project are ranked high in scale among the regular higher education institutions (HEIs), they play a major role in the improvement of these higher education indicators at the provincial level.

Table 13: Higher Education Indicators of Hebei Province

	Baseline	Target	Actual	Actual		
	2004	2012	2012	2014	2015	2016
	Baseline Year	One Year after Project Completion	Original Target Year for Project Completion	One Year after Project Completion	Two Years after Project Completion	Three Years after Project Completion at the Time of Ex-Post Evaluation
Number of regular High Education Institutions (HEIs)	87	95	113	118	118	120
Number of students enrolled in regular HEIs (persons)	940,000	1,500,000	1,164,300	1,164,300	1,179,200	1,216,100
Enrollment rate in HEIs	18.9%	25%	23%	31%	43%	n.a.
School building area per student (m <sup>2</sup> )	10.1	17.0	27.5	28.6	29.1	26.5
Monetary value of educational equipment per student (yuan)	3,984	5,847	7,924	9,425	10,328	10,094
Number of students per teacher (persons)	18.5	16.0	17.9	16.9	16.9	17.3
Graduation rate	99%	99%	99%	94%	95%	96%
Graduate employment rate	78%	92%	85%	95%	95%	96%
Post-graduate enrollment rate	11%	22%	9%	9%	9%	9%

Sources: JICA documents, responses to the questionnaire from the executing agency

### (3) Contribution to regional vitalization, strengthening of market rules and environmental conservation

In regard to the impacts on three development themes identified at the time of appraisal, i.e. ① regional vitalization, ② strengthening of the market rules and ③ environmental conservation, it was difficult to obtain quantitative data indicating the general situation. These impacts were also difficult to segregate as large universities were the subject of many projects in addition to this Higher Education Project. Nonetheless, several cases of contribution have been identified, as described below.

### 1) Regional vitalization

Leading universities in the engineering, education, medical and social science fields were included in the targeted universities and they have constantly producing graduates in those fields which are essential for regional vitalization. At some of the targeted universities, research work contributing to the promotion of key industries (steel, mining, etc.) in Hebei Province is in progress using equipment installed under the project. These industries provide the main employment opportunities for graduates. As the number of graduates increases, the number of graduates employed in these industries also increases. The promotion of key industries and the vitalization of poor areas are leading policy issues of every provincial government. Each university is engaged in many projects commissioned by government organizations, notably provincial government, contributing to regional vitalization. Moreover, there are many cases where universities become involved in local development by cooperating with local companies and organizations.

Table 14: Examples of Achievements Related to Regional Vitalization

University	Examples of Achievements
North China University of Science and Technology	<ul style="list-style-type: none"><li>Establishment of the Enterprise Support Team to accept entrusted research or joint research from local enterprises to assist their improvement of production</li><li>Employment of graduates of the Japanese Language Course by local Japanese subsidiaries, contributing to the local economy (attracting inward investment and expanding the activities of Japanese subsidiaries)</li></ul>
Hebei Normal University of Science and Technology	<ul style="list-style-type: none"><li>Establishment of the Social Contribution Team to assist the promotion of agriculture, targeting poor villages in the eastern part of Hebei Province, using equipment introduced under the project for soil analysis, etc.</li></ul>

Sources: Responses to the questionnaire from the executing agency

### 2) Strengthening of market rules

All universities in China are moving to become comprehensive universities. As a result, the number of graduates in relevant fields (Faculty of Law, Faculty of Accounting and Business Management, etc.) has generally shown an increasing trend at the targeted universities which are characterized by their emphasis on producing graduates capable of immediately conducting the necessary work to strengthen the market rules. Much of the educational equipment provided under the project has been regularly used for the purpose of producing industry-ready graduates.

Table 15: Example of Achievement Related to Strengthening of Market Rules

University	Example of Achievement
All of the Targeted Universities	<ul style="list-style-type: none"> <li>• Active engagement in the production of industry-ready graduates (① practical guidance for students through the introduction of a business management simulation system and software actually used by enterprises and ② active implementation of economic management-related lessons with science or engineering students)</li> </ul>

Sources: Responses to the questionnaire from the executing agency

### 3) Environmental conservation

The environmental field has become a key discipline at many universities due to the increasing need in China, and conscious efforts have been made to bolster environment-related disciplines. There have been cases where new environmental courses and departments have been established, and environmental studies have been designated as a key discipline after the commencement of the project. A number of graduates from the environmental courses has been increasing and environmental conservation was one of the prioritized areas for the consolidation of educational equipment and training in Japan under the project. There are many cases of a university receiving a grant (from the National Science Foundation of China, etc.) for a research project or being entrusted with a project by the administration. Some of these cases use the equipment and systems provided under the project and/or former trainees.

Table 16: Example of Achievement Related to Contribution to Environmental Conservation

University	Example of Achievement
Yanshan University	<ul style="list-style-type: none"> <li>• Invitation to a professor of Toyama University in Japan for exchange on solid waste treatment and waste water treatment (special lecture at the university and exchange of opinions after a field visit in China)</li> </ul>

Sources: Responses to the questionnaire from the executing agency

### (4) Facilitation of Cooperation and Mutual Understanding between Chinese and Japanese Universities

Table 17 summarizes the actual exchanges between the targeted universities and host universities in Japan after the completion of training (average number of exchanges per university). There are several cases of short mutual visits of professors or students. In contrast, the number of joint events, such as joint research and joint seminars, is rather small.

Table 17: Exchanges with Host Universities in the Post-training Period  
 (Aggregate from the End of Training to the Present: Average per University)

	Number of Inter-University Exchange Agreement	Short visit to Japan (times)	Short visit to China (times)	Acceptance of Japanese students (persons)	Dispatch of students to Japan (persons)	Joint research (projects)	Joint event (times)
Average of the Targeted Universities	0.8	6.2	6.8	2.8	7.8	0.3	0.4

Sources: Responses to the questionnaire from the executing agency

As described above, the actual performance of long-term specialist training was significantly lower than planned. As a result, many of the targeted universities conduct hardly any exchanges with Japanese universities, failing to achieve a sufficient outcome except for some universities. Those universities with ongoing exchanges used to have exchanges with Japanese universities prior to the project and these ties appear to have been enhanced by the project. Some concrete examples of achievements are shown in Table 18.

Table 18: Examples of Achievement Relating to the Promotion of Cooperation and Mutual Understanding between Chinese and Japanese Universities

University	Examples of Achievements
Hebei Medical University	<ul style="list-style-type: none"> <li>Since the completion of the project, new research exchanges with Japanese universities using the newly introduced equipment have been promoted and intensified. In the field of forensic medicine, equipment contributing to the promotion of joint research with Japanese universities was introduced under the project and 19 joint research projects were implemented between 2008 and 2016.</li> <li>Training was conducted with the guidance of a professor of Tokyo University with whom a teacher of Hebei Medical University was acquainted at an academic conference and the joint research conducted after the return to China produced three academic papers. Through the project, it has become possible to conduct such state-of-the-art joint research as the recombination of animal genes. Subsequently, three members of the same laboratory were dispatched to Tokyo University, continuing the exchange at an institutional as well as personal level.</li> </ul>
Hebei University	<ul style="list-style-type: none"> <li>The relationship with Tottori University which existed before the project was strengthened. Using the project as momentum, an academic exchange agreement was concluded between the two universities.</li> </ul>
Yanshan University	<ul style="list-style-type: none"> <li>Hiroshima University was already a sister university before the project. Using the project as momentum, the relationship was further strengthened, including the implementation of a joint project to nurture Ph.D. students from 2012.</li> </ul>
Agricultural University of Hebei	<ul style="list-style-type: none"> <li>Using the project as momentum, the university formulated the “Overseas Training Program for Young Teachers” for the purpose of sending many teachers overseas for training. Using its internal funds, the university allocated 5 million yuan a year to the program to send teachers to Europe, the USA and Japan. As a result, exchanges with Japanese universities have increased. The project has contributed to the shift of emphasis on overseas training/study to develop the university’s human resources.</li> </ul>
Hebei North University	<ul style="list-style-type: none"> <li>The relationship with Kyushu Foreign Language Academy has been strengthened along with the realization of an increased number of students sent to Japan for learning.</li> </ul>

Sources: Responses to the questionnaire from the executing agency

### 3.4.2 Other Positive and Negative Impacts

#### (1) Impacts on the natural environment

No negative impacts on the natural environment were observed. The environmental impact assessment (EIA) for the project was completed by the time of the appraisal and was approved by the Environmental Protection Bureau, and relevant procedures in China were all completed. Each university has been conducting necessary environmental monitoring of noise, dust, etc. during and after the project. According to those responsible for environmental issues at each university, as all of the measured values have been within the relevant standards set by the government, no problems have been identified.

#### (2) Land acquisition and Resettlement

As all of the new buildings were constructed on the existing university campuses, no

resettlement of residents or acquisition of land was required.

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

As planned during the appraisal, the facilities and equipment prepared under the project are operated and maintained by each targeted university, and the Education Department of Hebei of the subject province—the executing agency—oversee them. All targeted universities added the developed facilities and equipment to the universities' fixed assets and established the operation and maintenance system with clearly defined responsibilities and procedures by creating regulations such as the procedures for maintenance of large equipment and fund management, work regulations on experiment teaching, the procedures for fixed asset management, etc. In universities with a large number of equipment, there is a unified management system in place for the purpose of enhancing the effective and efficient use of the equipment. One example is the installation and operation of important equipment, including that provided under the project, at the testing and analysis centre. The respective roles of stakeholder organizations are clearly defined and no problems are found in regard to the staff strength required for equipment operation and management.

#### 3.5.2 Technical Aspects of Operation and Maintenance

No issues were observed in the technical aspects, since all targeted universities regularly carried out maintenance and inspection of the facilities and equipment and outsourced repair works to contractors, such as suppliers, when necessary. To secure the skills necessary to operate and maintain large laboratory equipment and sensitive measuring or analysis equipment, the universities appoint full-time technical staff for each instrument or laboratory to manage the equipment in an integrated manner. At all targeted universities, the manuals and precautions are posted near individual instruments for easy reference. Moreover, teachers in charge of operating and maintaining sensitive equipment receive regular technical training from the manufacturers. There are cases where mastering of the know-how to effectively use advanced equipment through training in Japan led to the improvement of operating skills. The utilization rate of the newly procured equipment has been high, and various research and educational activities using these equipment suggest that there are no issues regarding the technical capability of using the equipment.

### 3.5.3 Financial Aspects of Operation and Maintenance

The targeted universities are all affiliated with the provincial government. Their budgets consist of subsidies from the state or province and own income such as tuitions and fees. The interview survey with universities found that the financial support for universities by the government gradually increased under the 11th Five Year Plan (2006 - 2010), and this support was further consolidated under the 12th Five Year Plan (2011 - 2015). As shown in the table below, the increase of the provincial budget for education has been maintained even since 2011. Although the actual figure varies from one university to another, each university receives a minimum of several million yuan a year from the central government. In the case of large universities, the financial support amounts to 20 to 30 million yuan a year, including those by the provincial government, to maintain and improve the facilities. The available financial data indicates a steady expenditure level or trend of increase of both the provincial budget for education and university budgets and the balance between the income and expenditure is favorable in the targeted universities. Every university ensures sufficient budget allocation to cover the equipment maintenance cost. None of the principal equipment procured under the project has been unused due to an insufficient operating budget or repair budget.

Table 19: Financial Expenditure for Education of the Central Government and Hebei Province

		Unit: million yuan				
		2011	2012	2013	2014	2015
Central Government	Expenditure for education	99,905	110,146	110,665	125,362	135,817
	Educational expenditure index (2011 = 100)	100	110	111	125	136
Hebei Province	Expenditure for education	84,453	104,391	102,974	108,749	128,788
	Of which is the higher education expenditure	17,361	24,985	22,670	23,382	25,170
	Higher education expenditure index (2011 = 100)	100	144	131	135	145

Source: Statistics for Hebei Province and Responses to the questionnaire from the executing agency

### 3.5.4 Current Status of Operation and Maintenance

In all targeted universities, the equipment developed by this project are registered in the maintenance and management database. All expensive equipment are also registered and controlled by the public platform run by the provincial science and technology agency. Based on the observation and review of usage or inspection records for each equipment, it was confirmed that the principal equipment and systems were mostly in good condition. Some equipment, such as PCs, have short service lifespans.

While the deterioration of such equipment is now causing some problems, it is still continuously used. In the case of important equipment, there is a system at all the universities for users to record the equipment conditions and to note every time the equipment is used.

According to the replies of the targeted universities, expendables are stocked at a sufficient level as long as they are still produced and there are no problems in this aspect. (Those out of production are limited in number and can be sufficiently replaced by alternative products).

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

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

##### **4.1 Conclusion**

The project was implemented for the purpose of improving education and research at a total of 14 universities in Hebei Province in China through the improvement of relevant facilities and equipment and the training of teachers. Relevance of the project is evaluated to be high, as the project is consistent with (i) the higher education policies of China and Hebei Province, (ii) the development needs for quantitative and qualitative enhancement of the universities, and (iii) Japan's assistance policies. Although the effectiveness of the project is somewhat suppressed by the incompleteness of the long-term specialist training, the quantitative as well as qualitative expansion of higher education at the targeted universities is achieved, including the fulfilment of tangible (hard) and intangible (soft) development needs and significant improvement of various educational indicators. The high level of effectiveness and the impacts of the project are also substantiated by the improved outcomes of educational and research activities, making the best use of the advanced equipment and training and by the advancements in the various initiatives designed to achieve regional vitalization, environmental conservation, etc. resulting from such use of equipment and training. Efficiency of the project is evaluated to be fair on the whole: although the project cost is as planned, the project period exceeds the planned period due to delays in procurement. Sustainability is evaluated to be high, with no issues being observed in institutional, technical and financial aspects, and the operation and maintenance of the facilities and equipment developed by the project are in good status.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

None

### 4.2.2 Recommendations to JICA

None

## 4.3 Lessons Learned

### **(1) Importance of Sufficient Gathering of Accurate Information at the Time of Planning of Training Components**

In the project, information on past exchanges with Japanese universities, etc. was gathered in advance from the targeted universities, taking into consideration the lessons learned from the Higher Education projects in other provinces that matching with a host university in Japan had not been smoothly conducted. Based on this information, the candidate host universities in Japan (with which a targeted university had exchanges in the past or an exchange agreement) and candidate trainees (those who had an experience of exchange before) were narrowed down. However, according to the interview survey with those of the targeted universities, even if past exchanges with a candidate host university were said to have existed at the time of appraisal, no such exchanges existed with a targeted university, in reality. There was also a case where a professor with experience of an exchange did not participate in the training as he had moved to another university by the time of the commencement of the project. In short, the advance information gathering made hardly any contribution to the smooth matching.

When training in Japan is to be included in a similar education project as a project component and a recipient country's organization is supposed to search for the host university under the leadership of an organization of the recipient country, it is essential to thoroughly obtain accurate information on the relationship between the candidate host university and the university (organization) dispatching trainees at the project planning stage. In particular, when the gathering of information is entrusted to an organization of the recipient country, there may be a case where the gathered information may not be accurate. Therefore, sufficient care and verification efforts are required, including the checking of certificates and other documents. Failure to gather accurate information may lead to a delayed or incorrect response, possibly causing serious adverse impacts on the project outcomes. It is also vital to plan and implement the necessary measures to solve problems based on the information gathering results and to monitor the effects of these measures.

## **(2) Necessity for Measures for the Systematic Implementation of the Training Component in a Financial Cooperation Project**

When a financial cooperation project involving a large-scale training component is planned (especially when the project targets multiple organizations), it is important for JICA and the executing agency to prepare a viable plan, including an implementation schedule, at the planning stage and to adopt proper measures at the implementation stage to ensure systematic and steady implementation based on the plan so that the impacts of external factors can be minimized and the planned outcomes fully achieved.

The project initially planned to train (mainly long-term specialist training) total 206 people from 14 universities in Hebei Province at various Japanese universities. The status of training in the project was presumably very high at the planning stage while no training schedule, etc. were prepared. The emphasis of the executing agency on the introduction of equipment meant the delayed handling of the training component. The subsequent introduction of a policy for “stricter rules for trips abroad” (commenced in 2009) by the Government of China produced many cases where the permission to train in Japan was not granted. Consequently, the number of trainees which actually participated in long-term specialist training was as low as 49 (23 up to 2009 when the said policy was introduced). As a result, post-training exchanges between Chinese and Japanese universities have been low key. The delay of the training component increases the potential for negative impacts caused by such external factors as various policies even if they are not directly related to the project. For the training component of the project, therefore, it must have been necessary to formulate a feasible implementation plan centering on the implementation schedule through consultations with the executing agency and also to manage the progress of implementation to ensure the steady realization of training without delay (these consultations on plan formulation can expect such positive effects on the executing agency as ① reconfirmation and sharing of the importance of the training component and implementation procedure and ② promotion of a soft component which promises a strong synergy effect with the hard component). It may also have been worthwhile to identify the possible risks to ensure the implementation of the training component as planned so that measures to avoid such risks could be examined and worked out in advance.

It is essential to prepare thorough measures, especially when the targets of a project are multiple organizations. In the case of this project, one reason for the lack of a prior arrangement of the training implementation schedule may have been the fact that the targeted universities and potential trainees were expected to search for their own host universities. However, prior consent for the implementation schedule to a certain extent would have contributed to the smoother implementation of training.

### Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs		
(a)Hard Component i) Construction of Buildings etc.	<p>Targets: 14 universities in Hebei Province</p> <p>Hebei University of Technology: - Laboratory Building: 25,000 m<sup>2</sup></p> <p>Hebei Women's Vocational College - Foreign Language Institute Building: 15,000 m<sup>2</sup></p>	<p>Target: Same as planned</p> <p>Hebei University of Technology: - Engineering Training Centre: 4,441 m<sup>2</sup> - Civil Engineering Laboratory: 5,556 m<sup>2</sup></p> <p>Hebei Women's Vocational College: Same as planned</p>
ii) Procurement of educational equipment	<p>384 pieces</p> <p>1) Basic educational equipment 2) Laboratory and research equipment 3) Development of educational infrastructure (communication network, etc.)</p>	<p>387 pieces</p> <p>Same as planned</p>
(b)Soft Component Teachers' training in Japan	<p>206 persons</p> <p>Biology, medicine, chemistry, physics and other</p>	<p>181 persons</p> <p>University management, environment, mechanical engineering and other</p>
2.Project Period	April 2006 – March 2011 (60 months)	April 2006 – September 2013 (90 months)
3.Project Cost		
Amount Paid in Foreign Currency	5,775 million yen	5,557 million yen
Amount Paid in Local Currency	3,341 million yen (243.9 million yuan)	2,589 million yen (183.6 million yuan)
Total	9,116 million yen	8,146 million yen
Japanese ODA Loan Portion	5,775 million yen	5,557 million yen
Exchange Rate	1yuan =13.7 yen (As of September 2005)	1yuan =14.1 yen (Average of Project period 2006-2013)
4.Final Disbursement	October 2013	