

People’s Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

“Inland Higher Education Project (Regional Vitalization, Market Economy Reform Support, and Environmental Conservation) (Henan Province)”

External Evaluator: Takako Haraguchi, OPMAC Corporation

0. Summary

This project aimed to improve teaching and research at eleven major universities in Henan Province through the development of their facilities and equipment as well as providing training for teachers. Relevance of the project was evaluated to be high, as it was in line with (i) the higher education policies of China and Henan Province, (ii) development needs for quantitative and qualitative enhancement of the universities, and (iii) Japan’s assistance policies. Effectiveness/impact was also high, based on the observations that the project satisfied such needs, improved education activities by enabling more experiments, and improved research activities through outcomes achieved from advanced equipment and training, and thereby contributed to the promotion of the key industries as well as environmental conservation. Efficiency of the project was evaluated to be fair on the whole: although the project cost was within the plan, the project period significantly exceeded the planned period due to factors such as delays in the building construction following changes in location. Sustainability was evaluated to be high, with no problem observed in institutional, technical and financial aspects, and due to the good status of operation and maintenance of the facilities and equipment developed by the project.

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

1. Project Description



Project Location



Social Science Building of Zhengzhou University

1.1 Background¹

In China, together with the remarkable economic development, several development issues have arisen such as narrowing internal disparity between coastal and inland areas, reducing poverty, preparing for joining in the World Trade Organization (WTO) and handling global issues. To deal with these issues, the Chinese government put a high priority on development of human resources that were essential for the accelerated efforts towards developing a market economy and narrowing economic gaps under the policy to strengthen reform and promote openness. Accordingly, the government set out a target to increase the higher education enrollment ratio to 15% as well as adopting a policy to strengthen higher education institutions (HEIs) in inland areas.

Henan Province is located in the mid-eastern part of China with a total population of 95,550,000 persons (2001) and a total area of approx. 167,000 km². The province achieved high economic growth with an average annual gross domestic product (GDP) increase rate of 12% in the years 1996-2000, during the 9th 5-year Plan. However, per capita GDP (5,908 yuan in 2001) still remained below the national average (7,543 yuan). The provincial government aimed to promote a market economy and further economic development in the 10th 5-year Plan in Henan Province (2001-2005). Also, the 5-year Plan for Education in Henan Province (2001-2005) planned to increase the number of students in higher education to around 1,100,000 persons and the enrollment ratio to 15% by 2005. However, in order to achieve such targets, existing constraints in the “hardware” aspects (such as school facilities and equipment), “software” aspects (teachers) as well as financial aspects of HEIs (totaling 91 institutions in 2001) had to be addressed.

Under such conditions, this project specified three development issues, namely, (i) regional vitalization, (ii) market economy reform support, and (iii) environmental conservation of Henan Province, and aimed to contribute to human resource development in order to address such issues by enhancing quality and quantity of higher education at major universities in the province.

1.2 Project Outline

The objective of this project was to quantitatively and qualitatively enhance higher education at eleven major universities in Henan Province (Zhengzhou University, Henan University, Henan Normal University, Henan Agricultural University, Henan University of Science and Technology, Henan Polytechnic University, Henan University of Economics and Law, Henan University of Traditional Chinese Medicine, Xinyang Normal University,

¹ This project is one of the (Inland) Higher Education Projects funded by Japanese ODA loans targeted to universities in 22 provinces, municipalities or autonomous regions in inland China.

Zhengzhou University of Light Industry, Shangqiu Normal University)² by developing educational infrastructures such as buildings and equipment (improvement of the hardware aspects) and teachers' training (strengthening of the software aspects), thereby contributing to regional vitalization, market economy reform support, and environmental conservation of the province.

Loan Approved Amount/ Disbursed Amount	4,699 million yen / 4,556 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2003 / March 2003
Terms and Conditions	<p>Interest Rate 2.2% (0.75% for training component)</p> <p>Repayment Period 30 years (Grace Period) (40 years for training component) (10 years)</p> <p>Conditions for General untied Procurement:</p>
Borrower / Executing Agency	The government of People's Republic of China / Henan Provincial People's Government (Education Bureau)
Final Disbursement Date	July, 2011
Feasibility Studies, etc.	<ul style="list-style-type: none"> - "Feasibility Study Report", Henan Engineering Consulting Company, 2002. - "Special Assistance for Project Implementation (SAPI) for Higher Education Project in China", Japan International Cooperation Agency (JICA), 2003, 2004 and 2005. - "The Supervision Survey Report on JICA Loaned Higher Education Project", JICA, 2010.

2. Outline of the Evaluation Study

2.1 External Evaluator

Takako Haraguchi (OPMAC Corporation)

2.2 Duration of Evaluation Study

Duration of the Study: August 2013 – November 2014

Duration of the Field Study: October 27 – November 28, 2013 and March 23 – 31, 2014³

² The names of the universities are those as of today. The following universities had different names at the time of the appraisal of this project:

- Henan Polytechnic University: formerly known as Jiaozuo Institute of Technology (renamed in 2004);
- Henan University of Economics and Law: formerly known as Henan Institute of Finance and Economy (renamed in 2010).

³ The field study period included the periods for ex-post evaluation of the Inland Higher Education Project (Regional Vitalization, Market Economy Reform Support, and Environmental Conservation) (Anhui Province) and the Inland

3. Results of the Evaluation (Overall Rating: A⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Relevance to the Development Plan of China

The objective of this project is consistent with the five-year plans for economic and social development and the five-year plans for the education sector at both the national and provincial levels, as well as other education-related development strategies, which all aim at quantitative and qualitative development of higher education both at the times of appraisal and ex-post evaluations of this project (Table 1). While there were no large policy changes between the appraisal and ex-post stages, in recent years more importance has been given to higher education development. Also, the key industries of Henan Province have shifted to those that require higher technologies.

Table 1: Main objectives of development plans related to this project

	At the time of appraisal	At the time of ex-post evaluation
National level development plan	<u>The 10th 5-year Plan for National Economic and Social Development (2001–2005):</u> To increase higher education enrollment ratio to around 15% by 2005.	<u>The 12th 5-year Plan for National Economic and Social Development (2011-2015):</u> To emphasize higher education for promoting industrial advances (quantitative targets include 87% of junior secondary graduates to go on to senior secondary school)
National level education sector plan	<u>The 10th National 5-year Plan for Education (2001-2005):</u> To increase student enrollment in HEIs 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 12th National 5-year Plan for Education (2011-2015) and National Mid- and Long-term Reform and Development Plan for Education Sector” (2010–2020):</u> To increase higher education enrollment ratio from 26.5% in 2010 to 40% in 2020; to increase student enrollment in HEIs from 29,790,000 in 2009 to 33,500,000 by 2015; to develop HEIs in midwestern area with special focus on development of departments that are competitive and fostering of teachers.
Provincial level development plan	<u>The 10th 5-year Plan for Economic and Social Development in Henan Province (2001-2005):</u> To achieve annual economic growth rate of 8% by 2005; develop the key industries including petro-chemistry, machine industry, Chinese medicine, etc.	<u>The 12th 5-year Plan for Economic and Social Development in Henan Province (2011-2015):</u> To achieve annual economic growth rate of 7% or higher by 2015; to develop the key industries including automobile industry, electronic information, equipment manufacturing, light industry, construction materials, chemical industry, non-ferrous metal industry, etc..

Higher Education Project (Regional Vitalization, Market Economy Reform Support, and Environmental Conservation) (Heilongjiang Province).

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ② Fair, ① Low

	At the time of appraisal	At the time of ex-post evaluation
Provincial level education sector plan	<p>The 10th 5-year Plan for Education in Henan Province (2001-2015)</p> <p>To increase higher education enrollment ratio from 12% in 2001 to 15% in 2005; to increase student enrollment in HEIs to around 1,100,000 (including around 600,000 in regular HEIs⁶).</p>	<p>The 12th 5-year Plan for Education in Henan Province (2011-2015)</p> <p>To increase higher education enrollment ratio from 24.7% in 2011 to 36.5% in 2015.</p>

Sources: JICA appraisal documents; respective documents of the mentioned development plans.

3.1.2 Relevance to the Development Needs of China

Development needs were observed for the quantitative and qualitative enhancement of education at the eleven targeted universities at the times of both the appraisal and ex-post evaluations.

At the time of the appraisal, there was a need for quantitative expansion of higher education in order to narrow the economic gap mentioned in “1.1 Background” and following the increase of primary and secondary education in Henan Province (school intake rates in 2001 were 99.6% for primary education and 97.1% for secondary education). It was forecasted that the number of new entrants in regular HEIs would increase from 140,000 in 2001 to 180,000 in 2005. The eleven universities targeted by this project were all leading universities under the jurisdiction of Henan Province, but their financial resources for developing the hardware (facilities and equipment) and software (teachers’ training) aspects to address such increasing demand were limited. Also, there were few opportunities provided for the teachers to visit overseas.

At the time of the ex-post evaluation, although the real GDP growth rate had been higher than 10% since 2003, the need for narrowing the economic gap still existed in Henan Province: provincial per capita GDP was 31,723 yuan in 2012, which was 83% of the national average. The number of new entrants to regular HEIs in the province continued to increase from 340,000 in 2006 to more than 490,000 in 2012, and the need for quantitative and qualitative enhancement of HEIs remains high. The eleven targeted universities have continued to be the leading provincial universities. On the other hand, the need for hardware development seemed to have been more satisfied compared to the time of the appraisal, due to increased financial injection to provincial universities following the above-mentioned higher education development policies. The Education Bureau of Henan Province, the executing agency of this project, now puts more emphasis on the need to develop the software aspects such as improving the quality of teachers.

⁶ Regular (or standard) HEIs is a term referring to universities and colleges, including undergraduate programs of comprehensive universities and single-department colleges, specialized colleges (similar to junior colleges in Japan), and graduate programs. Adult higher education and higher vocational education institutions are not included. (Note for English translation only: in this report, “universities” include both universities and colleges that grant undergraduate or higher academic degrees unless otherwise mentioned.)

3.1.3 Relevance to Japan's ODA Policy

At the time of the appraisal, Japan's Country Assistance Policy for China, the Medium-term Strategy for Overseas Economic Cooperation Operations and the Country Assistance Strategy put priorities on human resources development from the viewpoint of support for openness and reform and post-WTO economic reform, and on assistance in the inland China from the aspect of narrowing the economic gap. The project objective was consistent with such aid policies of Japan. The Country Assistance Strategy upholds "regional vitalization and exchange", "market economy reform support", and "environmental conservation" as important areas of human resource development.

This project has been highly relevant to China's development plans, development needs as well as Japan's ODA policies, and therefore its relevance is evaluated to be high.

3.2 Effectiveness⁷ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

The number of students as well as various teaching and research-related indicators designated at the appraisal showed improvement between before and after this project. The set targets were achieved at the same as or better levels than expected. The effects of this project cannot be assessed by these indicators alone, since they measure operation and effects not only of this project but also of other projects (school building construction, equipment procurement, etc.) that were implemented around the same time by the province or target universities themselves. Nevertheless, by observing the use of the facilities and equipment developed and the activities of the teachers trained in Japan under this project, it was confirmed that this project constituted some factors which contributed to the improvement of the indicators.

(1) Quantitative expansion of teaching and research⁸

The number of students as well as the size of the facilities and equipment increased. The facilities and equipment developed under this project were well utilized, and therefore it can be said that they played the expected role as part of the response to the quantitative expansion of teaching and research.

First, the number of students increased far beyond the planned level at all targeted

⁷ Sub-rating for Effectiveness was given with consideration of Impact. Taking into consideration the project objective and plan set at appraisal, this ex-post evaluation was designed based on the following definition of the key elements of effectiveness and impact of this project:

- Effectiveness: quantitative and qualitative enhancement of teaching and research at the targeted universities;
- Intended impact: enhancement of teaching and research at the provincial level, and contribution to provincial-level development in the areas of regional vitalization, market economy reform support and environmental conservation;
- Other impacts: strengthening of exchanges and cooperation with universities in Japan.

⁸ In the appraisal, the target year for evaluating the quantitative indicators was set at 2006. However, due to the delays in project implementation (see "3.4 Efficiency"), the ex-post evaluation set the actual comparison year at 2012, a year after the project was actually completed (i.e. the equipment procurement completed).

universities (Table 2).

Table 2: Number of students
(Total number of graduate, undergraduate and single department college students)

Unit: Person

	Actual 2001	Planned 2006 (Planned year of completion)	Actual 2006 (Planned target year)	Actual 2012 (A year after project completion)
Zhengzhou Univ.	32,832	40,037	43,665	65,732
Henan Univ.	20,414	27,955	34,158	60,000
Henan Normal Univ.	12,816	19,000	29,442	31,209
Henan Agricultural Univ.	10,173	13,560	21,339	27,100
Henan Univ. of Science and Technology	11,145	28,000	28,207	36,615
Henan Polytechnic Univ.	9,964	17,000	27,696	52,863
Henan Univ. of Economics and Law	8,784	11,991	15,497	31,784
Henan Univ. of Traditional Chinese Medicine	6,729	10,349	10,324	16,780
Xinyang Normal Univ.	8,316	15,052	13,002	22,516
Zhengzhou Univ. of Light Industry	9,458	12,954	20,353	31,303
Shangqiu Normal Univ.	8,070	12,000	16,675	22,361
Total	138,701	207,898	260,368	389,263

Sources: JICA internal documents; responses to the questionnaire from the executing agency.

The floor area of school buildings also increased beyond the planned levels (Table 3). Most of the increase were funded by the province or the target universities (mainly private borrowing) outside of this project, and the floor area increased through this project accounts for only a small portion of the total increase (i.e. part of the areas of four universities). As a whole, however, the expanded area of school buildings has played a fundamental role in bringing about the desired effects of this project. The buildings developed by this project are fully utilized except for the one at Henan University of Economics and Law, where the construction work is still underway (see “3.4 Efficiency” for details).

Table 3: School building area
(Classrooms, laboratories, libraries, gymnasiums and auditoriums)

Unit: m²

	Actual 2001 Total area	Planned 2006		Actual 2006 Total area	Actual 2012	
		Total area	Portion under this project		Total area	Portion under this project
Zhengzhou Univ.	832,321	2,342,321	40,000	2,018,714	2,151,235	47,753
Henan Univ.	306,736	706,736	96,000	1,094,867	2,096,563	99,000
Henan Normal Univ.	206,500	467,400	0	608,191	701,840	-
Henan Agricultural Univ.	207,050	339,571	19,860	543,695	860,000	49,000
Henan Univ. of Science and Technology	326,825	863,000	0	1,011,359	1,532,756	-
Henan Polytechnic Univ.	198,617	531,000	0	756,914	1,146,991	-

	Actual 2001 Total area	Planned 2006		Actual 2006 Total area	Actual 2012	
		Total area	Portion under this project		Total area	Portion under this project
Henan Univ. of Economics and Law	246,071	328,141	11,000	922,594	1,615,110	11,000
Henan Univ. of Traditional Chinese Medicine	188,912	317,490	0	290,000	505,078	-
Xinyang Normal Univ.	155,923	443,260	0	414,350	489,317	-
Zhengzhou Univ. of Light Industry	136,518	201,000	0	292,800	488,912	-
Shangqiu Normal Univ.	95,000	145,000	0	136,500	303,166	-
Total	2,900,473	6,684,919	166,860	8,089,984	11,890,968	206,753

Sources: JICA internal documents; responses to the questionnaire from the executing agency.

The monetary value of educational and research equipment⁹ increased, and the portion procured by this project mostly achieved the planned value (Table 4). The total value substantially increased as well (mainly due to investments made by the provincial government and the universities themselves). While the equipment procured by this project now constitute only a part of the total value, the provincial Education Bureau and the targeted universities commented that they were particularly important during the project implementation stage when making large-scale investments on their own were difficult, and they continued to play a meaningful role at the time of ex-post evaluation.

Table 4: Total monetary values of educational and research equipment

Unit: thousand yuan

	University total		Portion under this project	
	Actual as of end 2001	Actual as of end 2012	Planned 2006	Actual as of end 2012
Zhengzhou Univ.	47,600	697,290	47,510	48,440
Henan Univ.	81,680	406,690	15,740	21,880
Henan Normal Univ.	53,270	244,810	28,520	25,510
Henan Agricultural Univ.	72,960	259,410	17,990	20,490
Henan Univ. of Science and Technology	66,990	282,080	35,600	38,490
Henan Polytechnic Univ.	65,420	348,300	28,150	35,310
Henan Univ. of Economics and Law	16,240	119,400	21,520	23,390
Henan Univ. of Traditional Chinese Medicine	21,790	162,450	19,010	15,870
Xinyang Normal Univ.	35,120	158,570	18,430	20,230
Zhengzhou Univ. of Light Industry	54,300	259,450	19,040	22,320
Shangqiu Normal Univ.	18,000	114,850	18,420	20,270
Average	48,500	277,570	24,540	26,560

Sources: JICA internal documents; responses to the questionnaire from the executing agency.

⁹ At appraisal, this indicator was not designated as an operation and effect indicator for this project. However, in the ex-post evaluation the indicator was considered necessary for confirming how the project responded to the quantitative expansion of teaching and research, and therefore the data was collected including those from before the project.

The equipment developed by this project have generally been well used, while some equipment such as personal computers made in 2006 were replaced with new ones due to obsolescence. All targeted universities answered that the utilization rates of major equipment procured under this project were more than 90%. They named many equipment as being useful, including laboratory analytical instruments, experimental equipment for teaching, computers and networking equipment. On the visits made to each target university for ex-post evaluation, the evaluator made observations of major equipment focusing on the more expensive or highly-used ones, and confirmed that they were being utilized.

(2) Qualitative enhancement of teaching and research

It was found that the average school building area and the monetary value of equipment per student satisfied the national standard at most targeted universities, implying that the quality of teaching/research environment was ensured to a certain degree (Table 5). The increment in the area per student achieved through this project was below the planned value due to the rapid increase in the number of students.

Table 5: School building area (teaching, research and administration) per student and monetary value of educational equipment per student

Units: m² or yuan

	School building area per student (m ²) ¹⁾					Value of educational equipment per student (yuan) ²⁾	
	Actual 2001	Planned 2006		Actual 2012		Actual 2001	Actual 2012
		Area per student	Increment through this project	Area per student	Increment through this project		
Zhengzhou Univ.	23.9	50.3	0.9	29.6	0.7	1,450	10,608
Henan Univ.	14.3	24	3.3	34.0	1.7	3,800	8,000
Henan Normal Univ.	15.6	22.8	-	22.5	-	4,152	7,844
Henan Agricultural Univ.	18.9	22.1	1.3	31.8	1.8	7,296	8,709
Henan Univ. of Science and Technology	28.5	29.7	-	41.9	-	N.A.	7,704
Henan Polytechnic Univ.	19.5	30	-	21.7	-	5,426	6,551
Henan Univ. of Economics and Law	27.7	26.7	0.9	50.8	0.3	1,849	3,757
Henan Univ. of Traditional Chinese Medicine	27.5	30	-	30.1	-	3,238	9,681
Xinyang Normal Univ.	18.7	28.7	-	21.7	-	4,223	7,043
Zhengzhou Univ. of Light Industry	14.4	15.3	-	15.6	-	5,751	8,288
Shangqiu Normal Univ.	11.8	12.1	-	13.6	-	2,244	5,136
Average	20.2	30.1	1.6	28.5	1.1	3,943 ³⁾	7,575

Source: Responses to the questionnaire from the executing agency.

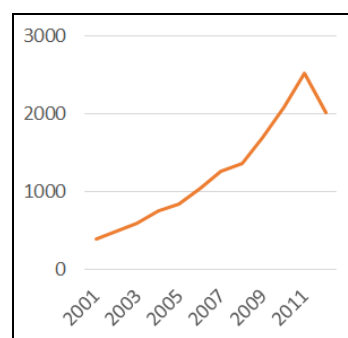
Notes: 1) The national standards of per student school building area of regular undergraduate schools are as follows: total school building area including canteens and dormitories should be “more than 30m²”, and teaching, research and administration building area should be “more than 20m²” in natural science faculties, “more than 15m²” in humanity and social science faculties and “more than 30m²” in physical education and art faculties (Interim Provisions for Establishment of Regular Undergraduate Schools, No.18 [2006]).

2) The national standard for value of educational equipment per student is “more than 5,000 yuan” for laboratory equipment in faculties of science and technology such as science, engineering, agriculture and medicine, “more than 3,000 yuan” for humanity and social science faculties, and “more than 4,000 yuan” for physical education and art faculties according to the above-mentioned Interim Provision No.18 [2006].

3) Average of the universities for which data was available.

Various indicators to measure the achievements of progress in the areas of teaching and research, such as the number of key disciplines and key laboratories¹⁰, the number of faculties/departments and graduate programs, the number of research projects and social (community) services¹¹ projects, the number of published research papers, the number of awards, the number of patents granted, etc., showed increasing trends (Table 6). Although such improvements are the outcome of the overall higher education development policies mentioned in “3.1 Relevance”, many cases are attributable to the outcome of this project through utilization of the facilities/equipment developed under the project and/or involvement of teachers who received training in Japan in teaching/research activities under this project. Below are some examples.

- Example of key laboratories: the equipment developed by this project was concentrated to construction of key laboratories. Eventually, five key laboratories such as the Key Laboratory of Henan Agricultural Biotechnology & Engineering (provincial key laboratory) and key disciplines were established. (Henan Agricultural University)
- Example of winning research projects: the Key Laboratory of Cotton Biology of the School of Life Science (state key laboratory since 2010, following the procurement of some equipment such as a super speed centrifuge under this project) won a project of the National Basic Research Program of China (“973 Program”). (Henan University)
- Example of social services: the equipment procured by this project such as a gas chromatography-mass spectrometry (GC-MS) system were used in a training course for 40 food inspectors in collaboration with Shangqiu City. The course was first held in 2012, and holding the same training course on a regular basis for local food companies and the quality supervision and inspection department is being considered. (Shangqiu Normal University)



Source: prepared based on responses to the questionnaire from target universities.

Figure 1: Total number of internationally- published research papers by each of the targeted universities

¹⁰ Key disciplines and key laboratories are ones that the state or a local government designates as a base for teaching or research activities and to which resources are preferentially distributed. In this ex-post evaluation, the number of these was used as indicators to show high quality of disciplines and laboratories.

¹¹ As Social (or community) services, the number of research, testing, etc. commissioned by external organizations (government, companies, etc.) and the number of training courses conducted for those organizations were counted.

- Example of research papers: a teacher who had been sent by this project to the National Institute for Material Science in Japan for research in the area of physical property published several papers in international journals after returning to China, including those in co-authorship with his advisor in Japan. The papers are highly acclaimed: one of them was selected as an opening article of a journal. (Xinyang Normal University)

Table 6: Trend of major teaching/research indicators (total of the targeted universities)

Indicator	Actual 2001 or 2006 ¹⁾	Actual 2012
Number of key disciplines (state level)	3	13
Number of key disciplines (provincial/ministerial)	78	660
Number of key laboratories (state level)	0	7
Number of key laboratories (provincial/ministerial)	12	126
Number of undergraduate faculties/departments	311	618
Number of master's degree programs	242	1,070
Number of doctorate degree programs	15	242
Number of research projects (state level)	151 (2006)	639
Number of research projects (provincial/ministerial)	1,070 (2006)	2,182
Number of social services projects ²⁾	414 (2006)	954
Number of award-winning researches (state level) ³⁾	2 (2006)	10
Number of award-winning researches (provincial/ministerial) ³⁾	117 (2006)	240
Number of patented research outcomes ⁴⁾	75 (2006)	921

Sources: JICA internal documents; responses to the questionnaire from the executing agency.

Notes: 1) Where the data of 2001 were either non-available or not comparable with the ex-post data due to difference in counting, the data of 2006 were used. 2) The number of social services projects is a total of the six universities that provided the data. 3) The number of award-winning researches is a total of the ten universities that provided the data. 4) The number of patented research outcomes is a total of the seven universities that provided the data.

3.2.2 Qualitative Effects¹²

(1) Effects on enhancement of teaching and research at each targeted university

Regarding effects of the hardware components, it was confirmed from interviews with the provincial Education Bureau and targeted universities as well as document review that the educational/ experimental facilities and equipment developed under this project have contributed to the improvement of the following aspects to a certain extent.

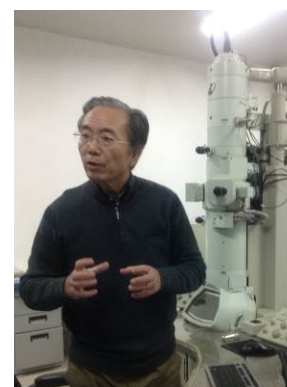
¹² In this ex-post evaluation, it was difficult to exclude effects of activities that were not under this project from the planned quantitative indicators. Therefore, while taking the trends of the indicators into consideration, qualitative information (collected by document review, questionnaires and interviews) was used to understand how specifically this project is related to such trends. The evaluator conducted individual or group interviews in a semi-structured manner with the provincial Education Bureau (executing agency) and, at each targeted university, with persons in charge of the project implementation as well as ex-participants in teachers' training in Japan. In total, 123 persons from the 11 universities (including 59 ex-participants in teachers' training in Japan) were interviewed. With respect to interviews with universities in Japan that accepted teachers for training from the targeted universities, the evaluator visited one of them and contacted several more universities by telephone or e-mail.

- The national undergraduate education level evaluation by the Ministry of Education¹³: during the implementation period of this project, four of the targeted universities became underwent the national undergraduate education level evaluation. Henan Institute of Finance and Economy, Henan University of Science and Technology and Henan Agricultural University were evaluated as “Excellent”, and Shangqiu Normal University was evaluated as “Good”. They commented that the equipment procured by this project contributed to such evaluation results through improvement of teaching conditions.



Atomic absorption spectrometer being used for testing of heavy metals in an assessment of industrial hygiene. (Shangqiu Normal Univ.)

- Upgrading of “college” to “university”¹⁴: Henan Polytechnic University and Henan University of Economics and Law were upgraded from a “college” to a “university” in 2004 and 2010, respectively. They commented that the facilities and equipment developed by this project contributed to expansion of facilities and equipment that became necessary as they became “universities”.



Transmission electron microscope (TEM), which is well managed and used in pathology examinations and professional TEM skills training for other universities. The head of the laboratory (photo) is an ex-participant of teachers’ training in Japan. (Henan Univ. of Traditional Chinese Medicine)

- Improvement of conditions for teaching and experiments: all targeted universities commented that they were able to eliminate shortages of facilities and equipment due to the rapid increase in students and that they became capable of providing more practical education by acquiring additional equipment and increasing the proportion of laboratory classes. For example, before this project, the Center of Numerical Control Processing of the College of Electromechanical Science and Engineering, Zhengzhou University of Light Industry, could perform only a part of the process of laboratory work due to lack of equipment. After the project, it became able to perform the whole process.

¹³ An evaluation conducted by the Ministry of Education of China to assure quality of higher education. 198 universities and 87 universities were evaluated in 2007 and 2008, respectively. The evaluation criteria are multifaceted including university management, teaching staff, students, facilities and equipment, academic disciplines/graduate programs, etc. The assessment is made in four levels, “Excellent”, “Good”, “Qualified”, and “Not Qualified”.

¹⁴ According to the Higher Education Law, the Provisional Regulations on the Establishment of Regular Higher Education Institutions, and the Interim Provisions for Establishment of Regular Undergraduate Schools, undergraduate schools of regular HEIs can take the name of either “college” (学院/xueyuang) or “university” (大学/daxue) in Chinese. The requirements for “university”, such as minimum size (number of students), minimum number of faculties, number of teaching staff with degree, etc.), are higher than those for “college”. (Note for English translation only: in their English names, colleges (学院) use various words including “college”, “university” and “institute”.)

- Regarding the enhancement of research and social services, all targeted universities answered that the equipment developed by this project enabled them to construct key laboratories, acquire new research projects and provide new social services (see also “3.2.1 Quantitative Effects).

As to effects of the software component, ex-participants in the teachers’ training in Japan provided the following comments. In each point, the numbers in () represents the number of universities (out of the eleven universities) where the interviewed teachers said the project was “useful” for the concerned aspect.

- Promotion (9 universities): after returning from Japan, teachers became core staff members (such as head of school, dean, head of research center, professor, qualified doctoral advisor, etc.) of the respective universities.
- Teaching method (9 universities): teachers were able to learn about the state of undergraduate and graduate teaching in Japan. Although it is difficult to directly apply it to undergraduate education in China (because the number of undergraduate students is much higher), they are utilizing a part of what they learned in their teaching after returning from Japan. For example, some started allowing undergraduate students to conduct experiments with graduate students. For graduate students, some teachers introduced to them the seminar style and experiments in smaller groups.
- Operation of laboratory equipment (2 universities): some teachers learned how to operate advanced laboratory equipment. (After returning to their universities, such experience and knowledge was useful when similar equipment was purchased either under this project or using other budget resources).
- Approach and style of research (8 universities): teachers were impressed by the attitude towards research in Japan, such as seriousness, attention to details, and thoroughness in pursuing the answer, and tried to incorporate such attitudes after returning to their respective universities.
- Contents and direction of research (8 universities): some teachers decided on research themes in Japan, and these determined the direction of their research thereafter. For example, teachers of Henan University of Traditional Chinese Medicine put into practice the making of a database of HIV samples that they learned about in the training in Japan. The database they made contributed to the establishment of the HIV bank in emerging epidemic area of Henan Province.

Besides such positive responses, all targeted universities pointed out that the 6-month duration of training, which was applied to the majority of teachers, was too short for participants to deepen their specialization skills. Therefore, some teachers extended their stay or revisited Japan using other financial resources or on their own.

The table below summarizes notable effects, including those mentioned above, of the project on teaching and research at each targeted university.

Table 7: Qualitative effects at each targeted university

Zhengzhou University	The university was participating in the 211 Project ¹⁵ and had various financial sources besides this project. Therefore, it is difficult to distinguish the effects of this project from those of other development works. Nevertheless, effects of this project existed although not very distinguishable at schools in natural sciences. As for schools in the arts, one case was found: a teacher of the School of Education learned about civil education in Japan, and used such knowledge in starting an education base for primary and lower secondary students in collaboration with the government of Xinyang City.
Henan University	The university is big and has various financial sources. Therefore, it is difficult to distinguish the effects of this project. Nevertheless, the development of equipment was relatively concentrated at the School of Life Science and the School of Environment and Planning, and there found some cases of improvement such as upgrading of a key laboratory (cotton) from the provincial level (designated by the province) to the state level (designated by the state).
Henan Normal University	The equipment developed by this project contributed to reinforcement of laboratories in areas such as biology and chemistry. At the School of Chemistry and Chemical Engineering, effects on the local economy were observed such as research and development of batteries (of which Xinxian City where the university is located is one of the two biggest places of production). Several teachers reported that they were able to decide their research themes or open a new course after they returned from their training in Japan. One unique case is that of a professor who learned about cultural properties protection in Japan and became active in the protection of an intangible cultural property of Xinxian City after his return. A number of teachers visited Japan again using their own money or other opportunities. Also, a double degree program with a university in Japan ¹⁶ has started.
Henan Agricultural University	The university concentrated large-scale laboratory equipment (including the ones developed by this project) to the sharing platform ¹⁷ and are using them for a wide range of basic research. Some unique cases of use of project equipment were found such as an uninterruptible power supply system installed at the Agronomy Information Center and studio equipment procured for development of multimedia teaching materials. Also, there are equipment that are used for development of new dairy products and vegetable by an enterprise established by the university. Most of the graduates are engaged in agriculture-related jobs in Henan Province. Most of the large-scale chicken farms and hog farms are run by graduates of this university.
Henan University of Science and Technology	A number of good practices were found: ex-participants in teachers' training in Japan and equipment developed at the Material Science and Engineering School contributed to development of a new material (which was commercialized by a collaborating company); a teacher in the area of economic management produced good results after returning from Japan; a teacher was engaged in teaching reform after returning from Japan; a campus information network was constructed and very strictly-managed to assure quality (equipment procured under this project constitute part of the system and ex-participants in teachers' training in Japan are involved in networking design and management of the system).
Henan Polytechnic University	The university put a higher priority to procurement of research equipment over basic educational equipment, and considers it was a good decision as the procured equipment may be utilized for long time. The university is actively engaged in research related to coal (major industry of Jiaozuo City where the university is located) and soil analysis. Large-scale laboratory equipment are shared among schools, and portable analytical equipment are lent to enterprises established by the university. The equipment also contributed to establishment of key laboratories. At the five

¹⁵ A national policy (started in 1996) to support approx. 100 key universities in a focused manner by the 21st century.

¹⁶ A mechanism by which a student can obtain degrees from two universities in parallel.

¹⁷ A system to which laboratories register their equipment for use by other faculties (schools) or outside institutions.

	departments of the School of Electrical Engineering and Automation, teachers' training in Japan and procurement of equipment were related to each other (i.e., equipment procured were used by teachers who returned from training in Japan). Unlike other target universities, teachers did not revisit Japan after the training under this project. According to them, it was difficult due to visa-related issues.
Henan University of Economics and Law	The university still uses the procured computers and multimedia systems made in 2006 with care. The reported effects of this project include smooth implementation of this project following participation in the university management course, modernization of means of teaching, improvement of teaching facilities (though concrete examples of those benefits were not shown), and continuing exchange with advisors of host universities since teachers' training in Japan.
Henan University of Traditional Chinese Medicine	A number of good practices were found including effects of teachers' training in Japan in HIV/AIDS, contribution of equipment procured to the establishment of a Level 3 traditional Chinese medicine testing laboratory ¹⁸ , and effective utilization of the transmission electron microscope (e.g. determination of causes of several diseases and testing services to other institutions such as Zhengzhou University and research institutions in Zhengzhou City). These cases are also good practices of good operation and maintenance of equipment as a result of thorough study of each of them before procurement.
Xinyang Normal University	The project significantly contributed to education in rural areas through development of graduates who would become teachers in Henan Province, training for rural teachers, etc. It was reported that ex-participants in teachers' training in Japan applied the Japanese teaching style that puts importance on experiment (practice) and encourages students' initiative, which led to high reputation of graduates at graduate schools of other universities they attended. Both equipment and training in Japan were utilized for establishment of major disciplines. There are equipment that are used not only for teachers' development but also for enhancement of research activities that would benefit the development of the city. The project also procured equipment such as basketball goals of international standard and electric score board at the gymnastic hall as well as pianos that are unique to normal universities.
Zhengzhou University of Light Industry	Various effects were found such as the establishment of provincial-level key laboratories using equipment procured by this project as a basis, and exchanges with universities in Japan at individual or faculty (school) levels as well as research outcomes that started from teachers' training in Japan. Some teachers extended their stay in Japan from 6 months under this project to 1 year using their own money, and enriched their research outcomes and exchanges with the host universities. Teachers who stayed in Japan for a shorter period also achieved certain outcomes as their research themes matched those at the host universities. This project enhanced the university's recognition of effectiveness of teachers' overseas experience: the university is planning to start a program to send 15 teachers every year for 1-2 year training abroad.
Shangqiu Normal University	The effects of this project to the university are characterized by various cases of social services to the local area, including industrial hygiene analysis at coal companies (coal is a major industry of Shangqiu City), breed improvement of strawberries, dispatch of teachers to rural areas, etc. After returning from training in Japan, some teachers visited Japan again on their own and some others are planning to do so. Also, exchanges are continuing such as inviting a professor from the host universities in Japan to Shangqiu Normal University for lectures.

Sources: Prepared based on responses to the questionnaire from targeted universities, interviews with them, information from their websites, etc.



Lecture using equipment procured by this project.

(Zhengzhou University of Light Industry)



Scanning electron microscope (SEM) being used by a teacher and her student for analysis of coal.

(Henan Polytechnic University)



Photographs of parts of batteries taken using SEM. The batteries were developed in collaboration with a company in Xinxiang City. (Henan Normal University)

¹⁸ The bio-safety level ranges from 1 to 4 (highest) according to the degree of danger of pathogens that the laboratory can handle.

3.3 Impact

3.3.1 Intended Impacts

(1) Enhancement of teaching and research at the provincial level

Table 8 shows selected higher education indicators at the provincial level. Improvement is seen in the quantitative indicators such as higher education enrollment rate that were planned at appraisal. As the targeted universities of this project are all top ranked among regular HEIs of the province in terms of size and other criteria¹⁹, it can be said that they have lead such improvement.

Table 8: Higher education indicators of Henan Province

	Actual 2001	Planned 2006	Actual 2006	Actual 2010	Actual 2012
Number of regular HEIs (of which universities with undergraduate programs)	91 (39)	90	84	107	120 (47)
Number of students enrolled in regular HEIs	570,000	1,300,000	970,000	1,460,000	1,590,000
Enrollment rate in HEIs	12%	16%	18%	24%	27%
School building area per student (average of targeted universities) (m ² /person)	34.1 m ²	30.0 m ²	31.0 m ²	28.9 m ²	31.9 m ²

Sources: Prepared based on JICA internal documents, responses to the questionnaire from the executing agency, provincial statistics, etc.

(2) Contribution to regional vitalization, market economy reform support, and environmental conservation

Regarding the three development issues intended at appraisal, namely, (i) regional vitalization, (ii) market economy reform support and (iii) environmental conservation, sufficient quantitative data to show the overall trend could not be collected for ex-post evaluation. Also, as large-scale universities tend to simultaneously implement a number of development projects, which made it difficult to see the impact of this project. Nevertheless, at least certain cases of contribution of this project were observed in all targeted universities, including the ones that the facilities and equipment were used for research that would benefit the development and environment of the province and the concerned cities, and that teachers who were trained in Japan were playing important roles in the educational aspect (i.e. through development of good graduates) and the research aspect (through university-industry collaboration and social services). Many cases are reported particularly in the area of environment.

¹⁹ For example, the total number of students of the eleven targeted universities accounted for 24% of the total number students of all of the 120 regular HEIs in the province, and all targeted universities are included in the 15 universities with the largest numbers of students in the province (data are all as of 2012). Also, according to “China Colleges and Universities Rankings 2012” of the Chinese Universities Alumni Association, all targeted universities were ranked between the 1st to the 18th places in Henan Province (Zhengzhou University was ranked first).

(i) Regional vitalization

First, regarding how the project provided human resources to the province's key industry (petrochemical industry, mechanical industry, traditional Chinese medicine, etc.), the targeted universities did not have precise data on employment status of graduates. Therefore, the number of graduates who majored in those fields were evaluated instead. From the available data the number of such graduates (ranging between 100 and 3,000 persons depending on university) showed an increasing trend. In this relation, targeted universities also commented that a certain portion of the graduates are employed in the concerned industry, and this project contributes to regional vitalization indirectly through improvement of graduates' practical skills. For example, at the School of Chemistry and Chemical Engineering of Zhengzhou University, equipment developed and a teacher trained in Japan under this project improved the quality of teaching and research (e.g., a research project won the third prize of the China Petroleum and Chemical Industry Federation), which impacted employment in petrochemical industry and chemical engineering machine industry. Also, there were cases found where the targeted universities located outside the provincial capital contributed to promotion of local industries such as coal industry in Jiaozuo City (Henan Polytechnic University) and battery industry in Xinxiang City (Henan Normal University) through university-industry collaboration and employment of graduates.

Utilization of the outputs of this project in vocational education and adult education was observed at two target universities. For example, there was a case where the equipment developed by this project was used for education of secondary school teachers and skills training for employees of state-owned enterprises (Henan University).

As for dispatch of teachers and doctors to rural areas, some universities said the project indirectly contributed to it in terms of enhancing practical skills of the teachers and doctors who are dispatched under the provincial policy, the graduates who are employed in rural areas and the students who are sent to rural areas for a term. For example, Xinyang Normal University reported that graduates were commended by the provincial Education Bureau for their outstanding achievement in education in rural areas. The university also said that the facilities and equipment developed by this project were useful in the "two-way training", in which students before graduation are sent to rural areas during the period when rural teachers are invited to the university for training.

(ii) Market economy reform support

The number of graduates in the related fields (i.e. economics, law, accounting, finance, etc.) are generally increasing (ranging between 100 and 8,000 persons depending on university). About half of the targeted universities acknowledged the indirect contribution of this project, mainly instruction by teachers who were trained in Japan, to provision of human resources with higher practical skills. Also, there were cases of contribution of some facilities/equipment and

teachers through social services and university-industry collaboration. On the other hand, at one of the targeted universities, this project did not cover the faculties and disciplines related to this issue (Zhengzhou University of Light Industry), and another university commented that while there may have been contribution of teachers trained in Japan, it was difficult to name concrete cases, and that impacts of training in Japan was limited as the duration of training (6 months, etc.) was short (Henan University of Economics and Law).

(iii) Environmental conservation

The number of graduates in the environment-related fields is increasing (ranging between 100 and 3,000 persons depending on university). Most of the targeted universities acknowledged indirect contribution of this project to environmental conservation through providing graduates with higher practical skills. At the same time, those universities all reported concrete cases where research outcomes, university-industry collaboration and social services using the procured equipment and the ideas or methods that teachers learned in Japan contributed to environmental measures. For example, at Henan Agricultural University, an ex-participant in teachers' training in Japan provides technical support to all projects of the Henan Province Forestry Bureau using equipment procured by this project (various analytical instruments) and the viewpoint of research that he learned in Japan. He also said that he opened two training courses related to ecological environmental issues.

3.3.2 Other Impacts

(1) Impacts on the natural environment

No negative impacts were observed. By the time of the appraisal, all targeted universities had completed the necessary domestic procedures of environmental clearance with the environmental impact assessments (EIA) approved by the environmental protection department of the province or the cities where the universities are located. Some noises, vibrations and dusts due to the building construction and foul water due to the use of the constructed facilities had been expected but to a small scale. During the project implementation period as well as after project completion, each school said that it has been taking necessary measures of exhaustion, water discharge and noise control and that it implemented environmental monitoring as planned.

(2) Land acquisition and resettlement

As planned in the appraisal, there was no land acquisition and resettlement associated with this project.

(3) Strengthening of exchanges and cooperation with universities in Japan

Impacts of the project on strengthening of exchanges with universities in Japan were observed. In some cases new relationships were built with universities in Japan, and in other

cases the existing relationships were strengthened after the project. However, there were not many cases of reaching official university-level cooperation, partly because many of the Japanese universities had already concluded agreements with other universities in China. Therefore, most of the exchanges seemed to be at the teacher (individual) or faculty levels, including invitation of teachers from Japan for lectures, sending students to Japan for study and joint research.

The outcomes of individual cases of exchange are described in Table 7. Overall, almost all of the interviewed ex-participants in the teachers' training under this project said that they had been strongly impressed by the elaborateness of teaching and research activities at universities in Japan and seriousness of the Japanese people, and had come to feel more familiar with Japan. Generally, western countries tend to be more preferred as the place to visit, but many teachers who participated in this project said that they talked about their research and life in Japan to their colleagues and students, who then gained a better understanding of Japan. For example, according to Henan University of Science and Technology, a specialized subject titled "Japanese Culture" was newly opened, and teachers trained in Japan under this project took turns providing lectures.

Further, an impact on international exchanges beyond those with Japan was observed: in recognition of the good human resource development outcomes of the teachers' training in Japan, Zhengzhou University of Light Industry is planning to start a program to send more than 15 teachers abroad for training every year. According to the university, the foundation of exchanges with foreign countries has been established, based on which visiting research and degree programs may be developed.

This project has largely achieved its objectives, therefore its effectiveness and impact is evaluated to be high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The actual production of the outputs is summarized in "Comparison of the Original and Actual Scope of the Project" on the final page of this report (the floor area of the buildings constructed for each university is in Table 3). The hardware outputs were developed mostly as planned with some differences in location of the buildings, construction materials to be procured under this project, and content and location of education/research equipment to be procured. Henan University of Economics and Law changed the location of a library to be constructed from the old campus to the new campus. Following this change, the



Data server room in the library. Security and hygiene are strictly controlled. An ex-participant in teachers' training in Japan undertook the optimization design. (Henan University of Science and Technology)

construction work was delayed and the building had not been completed at the time of ex-post evaluation. Nevertheless, the portion under this project - the procurement of steel for the foundation of the building – had been completed, and so was the construction of the foundation. Besides, Zhengzhou University, Henan University and Henan Polytechnic University cancelled some equipment as production of those equipment stopped while the project was delayed.

As for the software outputs, the actual number of participants in the teachers’ training in Japan significantly increased reflecting the high demand. Invitation of experts from Japan was cancelled as sending Chinese teachers to Japan was given higher priority.



Multimedia system. Though already old (made in 2006), it is still used after upgrading.
(Henan University of Economics and Law)



Basketball goal of international standard and electric scoreboard.
(Xinyang Normal University)



High performance liquid chromatograph (HPLC). As it was useful, the university purchased another one on their own.
(Henan Agricultural University)

3.4.2 Project Inputs

3.4.2.1 Project Cost

As shown in the table below, the total project cost was 8,489 million yen (of which the Japanese ODA loan was 4,556 million yen), which was within the plan (ratio against the plan: 99%).

Table 9: Planned and actual project costs

Unit: million yen

	Plan (appraisal)			Actual		
	Foreign currency	Local currency	Total	Foreign currency	Local currency	Total
1. Building construction	903	2,791	3,694	885	2,990	3,875
2. Equipment	3,263	786	4,049	3,364	893	4,258
3. Training	217	65	282	300	48	349
4. Price contingency	92	11	103	0	0	0
5. Physical contingency	224	183	407	0	0	0
Total	4,699	3,836	8,535	4,550	3,933	8,483

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

Notes: As the actual amount in the table does not include the disbursement charges, the total amount is different from the amount mentioned in the main text. Also, due to rounding down of the fractions smaller than 1 million yen, the breakdown and total amounts may not match. The exchange rates applied were: (planned) 1 yuan=15 yen; (actual) 1 yuan=13.8 yen.

3.4.2.2 Project Period

As shown in Table 10, the actual project period was more than 128 months, which was significantly longer than the planned 36 months (ratio against the plan: beyond 356%) due to the following reasons:

- Building construction: the process was delayed due to the adjustments of locations of new campuses (Henan Agricultural University, Henan University of Economics and Law).
- Equipment: the start of the procurement process was delayed for 24 months due to the outbreak of severe acute respiratory syndrome (SARS); in that period the models and specifications of the equipment that had been planned in 2003 changed, and thus reconsideration of them became necessary; a rise in the yuan exchange rate versus the Japanese yen in 2007 was beyond the exchange rate risk bearing capacity of the suppliers; the (Inland) Higher Education Projects were implemented in 22 provinces almost simultaneously, which caused concentration of procurement into limited routes; due to the prolonged procurement process for these reasons, it took time for re-contract on the equipment whose production stopped and for the customs exemption procedures.
- Training: the process was significantly delayed following the delayed start due to SARS (6 months) and the increase in the number of teachers to be sent to Japan.

Table 10: Planned and actual project periods (as of October 2013)

	Plan (appraisal)	Actual
Signing on Loan Agreement	March 2003	March 2003
Building construction	December 2004	Not completed yet
Procurement of equipment	December 2005	December 2010
Training	March 2006	July 2011
Project completion (lengths of months)	March 2006 (36 months)	Not completed yet (beyond 128 months)

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

3.4.3 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 was not possible.

Although the project cost was within the plan, the project period significantly exceeded the planned period, and therefore efficiency of the project is evaluated to be fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

As planned during the appraisal, the facilities and equipment developed under this project are operated and maintained by each targeted university, and the Education Bureau of Henan

Province, the executing agency, oversees them. All targeted universities added the developed facilities and the equipment to the universities' fixed assets, and established the operation and maintenance system with clearly defined responsibilities and procedures through establishing 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. The division of responsibilities among related organizations is clear, and there are no issues recognized with respect to the number of staff in charge of operation and maintenance.

3.5.2 Technical Aspects of Operation and Maintenance

No problem was observed in the technical aspects as all targeted universities regularly carry out maintenance and inspection of the facilities and equipment, and outsource repair works to contractors such as suppliers when necessary. To secure the skills necessary to operate and maintain large or sensitive laboratory 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. Also, it was reported that teachers in charge of sensitive equipment receive technical training regularly from the manufacturers.

3.5.3 Financial Aspects of Operation and Maintenance

The targeted universities are all overseen by the provincial government. Their budgets consist of subsidies from the state or province and own income such as tuitions and fees. Although the financial data were only partially available, the budgets of the province and individual universities are generally stable or in an increasing trend (Tables 11 and 12). Based on the interviews, it can be said that the necessary budget for operation and maintenance is ensured in the university budget²⁰. None of the main facilities and equipment developed under this project were found unused due to lack of budget for operations and repairs.

Table 11: Financial expenditure of Henan Province

Unit: million yuan

	2010	2011	2012
Total expenditure	341,614	424,882	500,640
of which education sector	60,937	85,714	110,651

Source: Prepared based on statistics from provincial Education Bureau.

Table 12: Operation and maintenance expenses of targeted universities

Unit: thousand yuan

	2010	2011	2012
Henan Normal Univ.	1,000	1,200	1,500
Henan Agricultural Univ.	650	650	850
Henan Univ. of Science and Technology	198	214	226
Henan Polytechnic Univ.	7,090	6,580	6,050
Henan Univ. of Traditional Chinese Medicine	200	200	200
Xinyang Normal Univ.	1,060	1,060	1,060
Shangqiu Normal Univ.	766	894	1,222

Source: responses to the questionnaire from target universities.

²⁰ Although the data were not available, all universities said that they use income from testing services and other services using equipment for maintenance of the equipment.

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. Based on observation and review of usage or inspection records, it was confirmed that the equipment were mostly in good condition. A user of equipment must record the usage as well as the conditions of the equipment every time they use it. In all universities, breakdowns and other troubles are handled either by repairing by themselves or by outsourcing (sending the equipment to manufacturers or having repair persons visit the laboratory). It was also reported that there were no major problems in purchasing and keeping stock of consumables. All universities said that there is no problem in purchase and stock of spare parts that are produced.



Single-crystal X-ray diffraction spectrometer. Operating for almost 24 hours a day. Kept in good conditions with maintenance by a teacher and a graduate student. (Henan University)

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to improve teaching and research at eleven major universities in Henan Province through the development of their facilities and equipment as well as providing training for teachers. Relevance of the project was evaluated to be high, as it was in line with (i) the higher education policies of China and Henan Province, (ii) development needs for quantitative and qualitative enhancement of the universities, and (iii) Japan's assistance policies. Effectiveness/impact was also high, based on the observations that the project satisfied such needs, improved education activities by enabling more experiments, and improved research activities through outcomes achieved from advanced equipment and training, and thereby contributed to the promotion of the key industries as well as environmental conservation. Efficiency of the project was evaluated to be fair on the whole: although the project cost was within the plan, the project period significantly exceeded the planned period due to factors such as delays in the building construction following changes in location. Sustainability was evaluated to be high, with no problem observed in institutional, technical and financial aspects, and due to the good status of operation and maintenance of the facilities and equipment developed by 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) The targeted universities are recommended to continue the proper use of the facilities and equipment developed under this project in teaching and research, as well as to extend the knowledge that has been gained from exchanges with Japan.
- (2) Construction of the unfinished building should be completed as soon as possible.

4.2.2 Recommendations to JICA

The higher education human resources who were developed by this project and who have gained a good understanding of Japan (i.e. teachers of the targeted universities) should be regarded as resource persons for future cooperation projects with China. Therefore, information on those human resources should be maintained. Utilization of the (Inland) Higher Education Projects web site, which is currently operated for the provinces where the Projects are still being implemented, could be considered. Possible ways to utilize the website for the provinces where the (Inland) Higher Education Projects have been completed could include updating of the information on, and encouraging posting from, those “completed” provinces.

4.3 Lessons Learned

(1) Planning of teachers’ training that is effective

In order to send as many teachers as possible to Japan, the most common duration of the teachers’ training under this project was around six months, which was, however, too short to deepen the participants’ research work. Therefore, a vision of how to make best use of the training should be elaborated from the project planning stage. Possible ways may include: reducing the number of teachers to be sent to Japan, but allowing them to stay longer such as for more than one year; setting the training or research themes with which the outcome is expected to be obtained in the short-term (i.e. during the six-month stay in Japan); removing the language barrier by sending teachers to the universities where there are Chinese advisors; selecting the teachers who have a will to pursue their research by extending their stay or visiting Japan again using other funds or even their own money; preparing a system to develop the contacts with Japanese advisors/universities that teachers could bring back from Japan into organization-level exchanges; preparing a JICA’s support to construct a system of re-visiting by ex-trainees to Japan and visits by Japanese advisors to China (e.g. approach the host universities in Japan and provide information and opportunities, etc.). This project eventually realized some of those ways, but the outcomes could be further maximized if future projects plan teachers’ training with a clearer strategic intent from the planning stage.

(2) Identifying effects of this project among many other ongoing development projects

Large scale universities often implement many development projects simultaneously. From

an evaluation perspective, it is hard to identify the outcomes of a certain cooperation project even if there is a high need for that project. When setting the expected outcomes of the project at appraisal, consideration should be given on how to assess the effects of the project, for example, whether looking at the aggregated (combined) effects of all projects or narrowing down the expected outcome (e.g. developing laboratories of a certain faculty) based on needs of the country and the type of project, and concentrating the inputs for the specific outcome²¹.

²¹ This ex-post evaluation eventually combined both ways of looking at project outcomes. However, as the appraisal did not seem to have paid attention to how to assess the effects of this project separately from other projects, the plan-actual comparison was possible only to a limited extent.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	Target: 11 universities in Henan Province	Target: same as planned
(a) Hardware		
i) Building construction	8 buildings such as teaching building for 4 universities; total floor area of 167,000m ²	Completed: 6 buildings such as teaching building for 3 universities; total floor area of 195,753m ²
ii) Procurement of educational equipment	Physics, chemistry, biology, environmental engineering, electrical engineering, physical chemistry, chemical engineering, traditional Chinese medicine, geology, education engineering, multimedia, campus net, etc.	Areas of education: same as planned Total 1,050 items 9,539 pieces
(b) Software		
Teachers' training in Japan or acceptance of experts from Japan	Total 232 persons (including 16 experts from Japan)	Total 318 persons sent to 82 Japanese universities or institutions (experts from Japan: none)
2. Project Period	March 2003 – March 2006 (36 months)	March 2003 - not completed as of October 2013 (more than 128 months)
3. Project Cost		
Amount paid in Foreign currency	4,699 million yen	4,556 million yen
Amount paid in Local currency	3,836 million yen (258 million yuan)	3,933 million yen (285 million yuan)
Total	8,535 million yen	8,489 million yen
Japanese ODA loan portion	4,699 million yen	4,556 million yen
Exchange rate	1 yuan = 15 yen (As of September 2002)	1 yuan=13.8yen (average during 2004-2011)