

People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan

Gansu Higher Education Project

External Evaluator: Takako Haraguchi, OPMAC Corporation

## 0. Summary

This project aimed to improve teaching and research at eight major universities in Gansu 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 Gansu 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 production of teachers for rural areas. 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 delays in the determination of training host universities in Japan, delays in procurement of some equipment, as well as external factors such as severe acute respiratory syndrome (SARS). 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



Equipment procured funded by ODA loan in the building constructed using local funds under this project (Lanzhou University of Finance and Economics)

## 1.1 Background<sup>1</sup>

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.

Gansu Province (total population of 25,570,000 persons in 2000; total area of approx. 454,000 km<sup>2</sup>, facing Ocher Plateau, Mongolian Plateau and Tibetan Plateau) achieved high economic growth with an average annual gross domestic product (GDP) increase rate of 9.2% in the years 1996-2000, during the 9<sup>th</sup> 5-year Plan. However, per capita GDP (3,836 yuan in 2000) still remained at 54% of the national average (7,078 yuan). Aiming towards promotion of a market economy and further economic development in the 10<sup>th</sup> 5-year Plan in Gansu Province, the provincial government planned to increase the number of students in higher education to around 210,000 persons and the enrollment ratio to 10% 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 18 institutions in 2000) had to be addressed.

## 1.2 Project Outline

The objective of this project was to quantitatively and qualitatively enhance higher education at eight major universities in Gansu Province (Lanzhou University of Technology (LUT), Lanzhou Jiaotong (traffic) University (LZJTU), Northwest Normal University (NWNLU), Lanzhou University of Finance and Economics (LUFEB), Lanzhou University (LZU), Gansu Agricultural University (GAU), Gansu College of Traditional Chinese Medicine (GCTCM), Tianshui Normal University (TSNC))<sup>2</sup> 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 the market-oriented economic

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

<sup>2</sup> The names of the universities are those as of today. The following universities had different names at the time of the ex-ante evaluation of this project:

- Lanzhou University of Technology: formerly known as Lanzhou Institute of Technology (renamed in 2003)
- Lanzhou Jiaotong University: formerly known as Lanzhou Railway University (renamed and expanded in 2003)
- Lanzhou University: merged with Lanzhou Medical School (target school of this project) in 2004.

reform in Gansu Province and reduction of disparity with coastal areas<sup>3</sup>.

Loan Approved Amount/ Disbursed Amount	4,665 million yen / 4,280 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2002 / March 2002
Terms and Conditions	Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Bilateral tied
Borrower / Executing Agency	The government of People's Republic of China / Gansu Provincial People's Government (Education Bureau)
Final Disbursement Date	July, 2009
Main Contractor (Over 1 billion yen)	None
Main Consultant (Over 100 million yen)	None
Feasibility Studies, etc.	<ul style="list-style-type: none"> <li>- "Feasibility Study Report: Talent Training Program of Higher Education in Gansu Province with the Loan from Japan", Engineering Consulting Center of Gansu Province, 2001.</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>

## 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 2012 – September 2013

Duration of the Field Study: March 17 – April 10, 2013 and May 26 – June 3, 2013<sup>4</sup>

<sup>3</sup> At the time of the ex-ante evaluation, the direct targeted outcome of the project was "to improve quantitatively and qualitatively higher education in Gansu Province", and the indirect targeted outcome (impact) was "to contribute to the market-oriented economic reform in China and reduction of disparity". However, since the targeted universities were only part of the HEIs in the province, the target area was lowered by one level for this ex-post evaluation.

<sup>4</sup> The field study period included the periods for ex-post evaluation of the Chongqing Higher Education Project and the Sichuan Higher Education Project.

### 3. Results of the Evaluation (Overall Rating: A<sup>5</sup>)

#### 3.1 Relevance (Rating: ③<sup>6</sup>)

##### 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 and the Western Development Project, which all aim at quantitative and qualitative development of higher education both at the times of ex-ante and ex-post evaluations of this project (Table 1).

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

	At the time of ex-ante evaluation	At the time of ex-post evaluation
National level development plan	<u>The 10<sup>th</sup> 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 12<sup>th</sup> 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 10<sup>th</sup> 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; to strengthen support to fostering of teachers.	<u>The 12<sup>th</sup> 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 inland area with special focus on development of departments that are competitive and fostering of teachers.
Provincial level development plan	<u>The 10<sup>th</sup> 5-year Plan for Economic and Social Development in Gansu Province (2001-2005):</u> To achieve annual economic growth rate of 8% by 2005; develop the key industries including petro-chemistry, metallurgy, mechanical electronics pharmaceutical chemicals, light spinning and food, pharmaceuticals and construction materials.	<u>The 12<sup>th</sup> 5-year Plan for Economic and Social Development in Gansu Province (2011-2015):</u> To achieve annual economic growth rate of 12% by 2015; to develop the key industries including new energy, manufacturing using new energy, new materials, new pharmaceuticals and bio-based industries and information technology.
Provincial level education sector plan	<u>The 10<sup>th</sup> 5-year Plan for Education in Gansu Province (2001-2015)</u> To increase higher education enrollment ratio from 7.9% in 2001 to 10.0% in 2005; to increase student enrollment in HEIs to around 210,000 (including around 140,000 in regular HEIs <sup>7</sup> ).	<u>The 12<sup>th</sup> 5-year Plan for Education in Gansu Province (2011-2015)</u> To increase higher education enrollment ratio from 23% in 2011 to 32% in 2015.

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

<sup>5</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>6</sup> ③: High, ②: Fair, ①: Low

<sup>7</sup> 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. In this report, “universities” include both universities and colleges that grant undergraduate or higher academic degrees unless otherwise mentioned.

While there were no large policy changes between the ex-ante and ex-post stages, in recent years more importance has been given to higher education development. Also, the key industries of Gansu Province have shifted to those that require higher technologies.

### 3.1.2 Relevance to the Development Needs of China

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

At the time of the ex-ante evaluation, 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 Gansu Province (school intake rates in 1999 were 99.1% for primary education and 94.4% for secondary education). It was forecasted that the number of new entrants in HEIs would increase from 60,000 in 2000 to 80,000 in 2005. There were 18 regular HEIs in Gansu Province, among which the eight targeted universities were the leading provincial universities<sup>8</sup>. They were expected to further expand their roles of producing human resources for the above-mentioned key industrial sectors and teachers for rural areas, but financial resources for developing the hardware (facilities and equipment) and software (teachers’ training) aspects were limited. Also, there were few opportunities provided for the teachers to visit overseas.

At the time of the ex-post evaluation, although economic growth remained high at an annual average of 10.9% for the years 2000-2011, the need for narrowing the economic gap still exists in Gansu Province: provincial per capita GDP is 19,595 yuan in 2011, which is 50% of the national average 39,442 yuan. The number of new entrants to HEIs in the province continued to increase from 100,000 in 2007 to more than 120,000 in 2011, and the need for quantitative and qualitative enhancement of HEIs remains high. On the other hand, the need for hardware development seemed to have been more satisfied compared to the time of the ex-ante evaluation, due to increased financial injection to provincial universities following the above-mentioned higher education development policies. The Education Bureau of Gansu 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.

### 3.1.3 Relevance to Japan’s ODA Policy

At the time of the ex-ante evaluation, Japan’s Official Development Assistance (ODA) Charter (1992) placed emphasis on Asian regional support and human resources development

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<sup>8</sup> National and public universities in China are under the jurisdiction of the state (Ministry of Education or other state government organizations) or local (sub-national) governments. In Gansu Province, Lanzhou University (which merged with Lanzhou Medical School, a targeted school of this project) is under the jurisdiction of the state (i.e. overseen by Ministry of Education), and listed in the “Project 211” (1996-), a national project to intensively support approx. 100 key universities to enhance their research capabilities by the 21<sup>st</sup> century.

support. Additionally, the Country Assistance Policy for China and the Medium-term Strategy for Overseas Economic Cooperation Operations and 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 mid-western region in China from the aspect of narrowing the economic gap. The project objective was consistent with such aid policies of Japan.

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

The objective of the project, "quantitative and qualitative enhancement of higher education of the targeted universities", has been achieved based on the performance of quantitative indicators as well as qualitative information that are presented in the following sections.

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

##### (1) Quantitative expansion of teaching and research<sup>10</sup>

The hardware outputs of this project increased the aggregated floor area of school buildings and the monetary value of educational equipment. With respect to the aggregate floor area of school buildings, the ex-ante evaluation set out the target values for individual universities, and those were mostly achieved (Table 2 and Figure 1). The utilization rates of the facilities and equipment developed by this project are high at 100% (for facilities) and more than 80% (for equipment)<sup>11</sup> at all universities. Therefore, it can be said that the project well responded to the needs for quantitative expansion of higher education (i.e. constant increase in the number of students as shown in Figure 2).

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

<sup>10</sup> In the ex-ante evaluation, the target year for evaluating the quantitative indicators was set at 2005, which was after the planned project completion date. However, due to the delays in project implementation (see "3.3 Efficiency"), the ex-post evaluation set the actual comparison year as follows: the targets related to the building construction component (completed in 2004) were compared with the actual performance in 2005; the targets related to the equipment (procurement) component and the training component (mostly completed in 2008 except one item (for one university) that was delivered in 2009) were compared with the actual performance in 2009; the targets related to more than two components were compared with the actual performance in 2009. When data for 2009 were not available, the comparison was made with the actual performance in 2011. To show the situation at the time of ex-post evaluation, the data of 2011 were mainly used. While the field study was conducted from 2012 to 2013, the data for 2011 are considered to be the latest reliable data that have been checked and compiled.

<sup>11</sup> The utilization rates are based on responses to questionnaires provided by each targeted university. The definition of utilization rates at the time of ex-ante evaluation was "actual usage hours divided by planned usage hours". However, the actual usage could not be compared with the target values based on that definition, since, according to the targeted universities, it was impossible to actually calculate the rates in such manner because planned usage hours varied depending on the types of equipment. According to the interviews with them, the figures provided seemed to represent "the number of equipment that is currently used (i.e. in operation) divided by the total number of equipment procured". Yet, the results of the visits to each university, observation of the facilities/equipment, and review of some usage records are consistent with the figures provided, and thus imply that the questionnaire responses more or less reflect the actual usage of the outputs of the project.

The facilities and equipment related outputs of this project accounted for on average only 3% of the total facilities (in terms of floor area) and 20% of the total educational equipment (in terms of monetary value) of the targeted universities as of 2009 after the project completion. Nevertheless, they played an important role of establishing a foundation on which later development works by the Chinese side took place. More specifically, (i) the project took a strategy to concentrate its resources to the development of key teaching/research areas that required to be strengthened, and (ii) the facilities and equipment developed under this project were highly valued and therefore became the decisive factor in determining the areas that were worth investing in further, which brought in other development funds. In particular in around 2002 when it was difficult for the targeted universities to make large scale facility investments on their own, the effective role played by this project was larger than the actual percentages indicate.

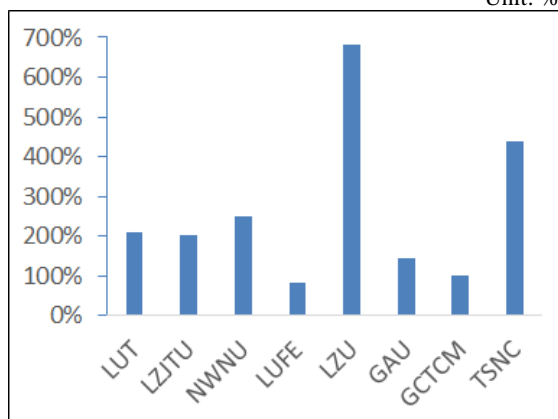
Table 2: School building area

Unit: m<sup>2</sup>

	Actual value 2000	Planned value		Actual value		Actual value 2011
		2005	Portion under this project	2005	Portion under this project	
LUT	268,684	564,000	30,000	694,201	37,455	1,557,000
LZJTU	205,439	421,385	20,000	793,477	20,567	949,100
NWNU	312,101	559,493	28,420	685,363	28,420	685,363
LUFE	145,403	482,014	9,700	427,246	9,700	888,000
LZU	153,000	364,980	4,000	1,181,722	4,000	1,248,737
GAU	165,163	327,450	0	362,544	0	422,635
GCTCM	67,460	96,962	13,000	161,055	13,000	153,255
TSNC	109,679	220,000	8,100	306,853	8,100	353,724
Total	1,426,929	3,036,284	113,220	4,612,461	121,242	6,257,814

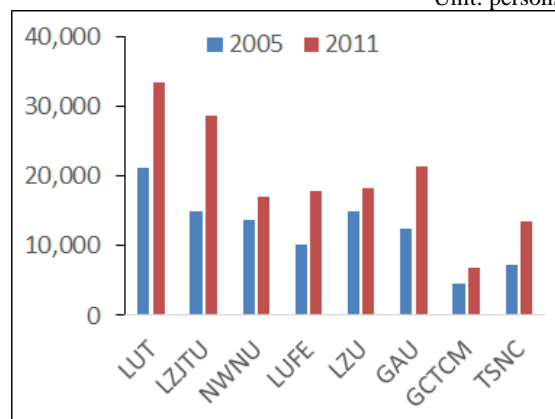
Sources: JICA appraisal documents; responses to the questionnaire

Unit: %



Source: responses to the questionnaire

Unit: persons



Sources: JICA appraisal documents; responses to the questionnaire

Figure 1: Increase rates of monetary values of educational equipment, 2005-2009

Figure 2: Number of students

## (2) Qualitative enhancement

As shown in Table 3, the average school building area per student increased beyond both the target set in the ex-ante evaluation and the national standard, and the monetary value of educational equipment per student satisfied the national standard, implying that the increase in students would not have adversely affected the conditions (quality) of teaching and research at all targeted universities.

Various indicators to measure the achievements of progress in the areas of teaching and research, such as the number of key disciplines and key laboratories<sup>12</sup>, the number of faculties/departments and graduate programs, the number of research projects and social (community) services<sup>13</sup> projects, the number of published research papers, the number of awards, the number of patents granted, etc., showed increasing trends. 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. In particular, the number of provincial or ministerial key laboratories and research papers published in international journals significantly increased comparing before and after the implementation period of this project (Figures 3 and 4), and it was observed in many targeted universities that new key laboratories were approved mainly based on facilities/equipment developed under this project (GCTCM, the Medical School of LZU, TSNC, etc.), and that the training/research in Japan promoted the participating teachers to start publishing articles in international journals (LUT, NWNNU, etc.) For example, Institute of Energy and Power Engineering of LUT have produced 120 research papers related to this project, including more than 30 internationally-published papers listed in the SCI (Science Citation Index).

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<sup>12</sup> 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.

<sup>13</sup> Social (or community) services are research, testing, etc. that are commissioned by external organizations (government, companies, etc.)



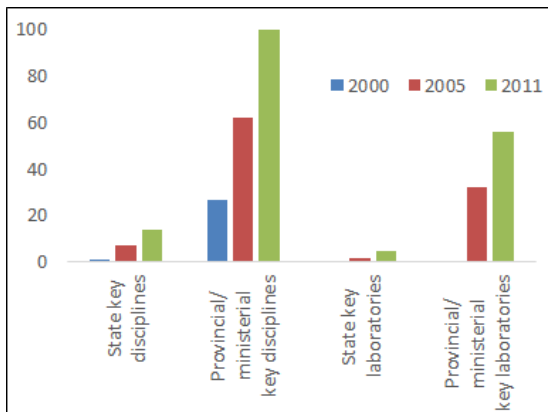
Table 3: School building area per student and monetary value of educational equipment per student

Units: m<sup>2</sup> or yuan

	School building area per student (m <sup>2</sup> )					Value of educational equipment per student (yuan)		
	Actual 2000	Planned 2005		Actual 2005		Actual 2011	Actual 2005	Actual 2011
		Area per student	Increment through this project	Area per student	Increment through this project			
LUT	34	31	0.56	56	2.04	62	6,619	8,670
LZJTU	28	28	0.50	39	1.37	67	6,500	7,600
NWNU	33	36	0.40	29	1.83	35	4,731	9,370
LUFE	30	31	0.70	41	0.61	36	3,700	3,300
LZU	37	46	0.49	87	0.51	78	23,136	45,891
GAU	30	30	0.49	30	0.00	40	5,002	5,210
GCTCM	27	22	0.43	56	2.80	62	6,730	6,027
TSNC	26	29	0.43	39	1.08	67	2,876	6,837
Average	31	31	0.50	47	1.28	56	7,412	11,613

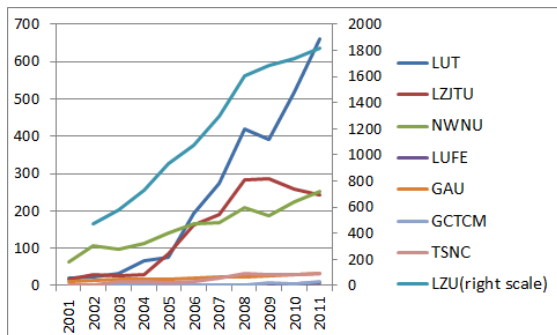
Sources: JICA appraisal documents; responses to the questionnaire

Note: the national standard of school building area per student is “more than 30m<sup>2</sup>”; 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 (Interim Provisions for Establishment of Regular Undergraduate Schools, No.18 [2006]).



Sources: JICA appraisal documents; responses to the questionnaire

Figure 3: Total number of key disciplines and key laboratories of the 8 targeted universities



Source: Responses to the questionnaire

Note: The figures represent the total numbers of research papers included in SCI (Science Citation Index), EI (Engineering Index) and ISTP (Index to Scientific & Technical Proceedings) databases.

Figure 4: Total number of internationally-published research papers by each of the 8 targeted universities

### 3.2.2 Qualitative Effects<sup>14</sup>

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

On the teaching side, all targeted universities said that the facilities and equipment developed under this project improved the conditions for teaching and experiments both quantitatively and qualitatively. Specific comments include: “the lack of experimental facilities was resolved”, “the ratio of classes with experiment increased”, “more creative experiments became possible”, and therefore “comprehensive skills of students improved” and “opening of new courses became possible”. For example, microscopes that GAU had at the beginning of this project had all been produced in the 1970s-80s, and many of them were not in usable condition. Since this project procured basic teaching equipment including microscopes, experiments were introduced to all classes that needed them, which enhanced the students’ practical skills. According to TSNC, immediately prior to the beginning of this project it was upgraded to a university from a tertiary short-cycle (specialized) school, and it faced a need to provide new undergraduate courses (i.e. modern physics). Under this project, 87 sets of equipment were procured for four laboratories, and they are used for 140 course hours of classes every year. Being the only university with undergraduate programs in Tianshui City, the university has become the leading HEI in the city. Also, the equipment procured under this project played an important role in the establishment of a new discipline (Traditional Chinese Medicine at GCTCM) and new graduate programs (LUFU and LUT), though such enhancements were not all attributable to this project alone.

With respect to research and social services, all targeted universities confirmed the improvement of their research activities thanks to the facilities/equipment and teachers’ training provided under this project. For example, at LZJTU, a teacher who attended the training in Japan later took part in national key research projects such as on durability of materials for the Qinghai–Tibet railway using the equipment procured under this project. Those projects received several awards including the State Science and Technology Advancement Award<sup>15</sup>. In case of GCTCM, it had received only 10-20 thousand yuan of scientific research grants every year before the project. With the equipment procured under this project, the university established the Research Center, gradually expanded it using its own funds, and started to be engaged in national projects in the field of traditional Chinese medicine which it “had never imagined

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<sup>14</sup> 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 Education Bureau of Gansu Province (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, 86 persons from the 8 universities (including 34 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 2 of them and contacted several more universities by telephone or e-mail.

<sup>15</sup> The State Science and Technology Advancement Award is one of the science and technology awards granted at the national level.

before the project”. Consequently, the research grants amounted to 40 million yuan by the time of the ex-post evaluation. In addition, there were a number of instances where research and social services activities related to this project benefited the region, such as the development of cold resistant varieties of agricultural products by GAU, the improvement of alkaline soil in the Silk Road region by NWNNU, and the geological analysis for the Maijishan Grottoes (one of the four stone caves in China) by TSNC.

It was pointed out that the training in Japan had effects such that it helped participating teachers have broader views for improving their teaching content and methods, find new research topics, and deepen and improve the quality of research. For example, a teacher of NWNNU continued the joint research on developmental psychology that she started with a teacher of the host university in Japan, and they co-authored a book published in Japan. A teacher of the School of Chemical and Biological Engineering of LZJTU stayed in the host university in Japan for one year<sup>16</sup> in order to conduct research in the field of super-molecular chemistry that was at the top level of the world, and after his return to China, he presented more than 100 research papers in many academic journals including the Journal of Organic Chemistry (the United States), a leading journal in the field.

The 40-day training courses in university management were highly appreciated by most of the teachers interviewed for this ex-post evaluation: specific merits that many of them mentioned included the smooth proceeding of the training programs based on careful preparation, diversified and specialized programs and contents, and the discussions held on the issues that China is also facing, such as how to cope with the declining birth rate and job shortage. For both specialized fields and university management training, many targeted universities sent candidates for executive positions, which contributed to the university-wide expansion of the effects of training outcomes. For example, the training under this project was the first opportunity for a vice president of GCTCM to visit a university overseas. He said he was deeply shocked by the concepts of university management that he learned in the training program, and after his return to China, he provided suggestions about the concept of “professionally managing a university” to the university authorities, and applied what he learned to various improvement activities such as building disciplines, human resource development, opening an innovation course and developing the management system for the Research Center. In another example, a teacher of TSNC established, based on what he learned in Japan, a graduates’ association that facilitated graduates to make donations and provide opportunities for receiving practical training in companies. He also said that he changed his way of teaching based on ideas to enhance practical skills of students. One of the changes was to have a 5-minute question and answer session at the end of each class.

Table 4 below summarizes notable effects of the project on teaching and research at each

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<sup>16</sup> The training period varied from less than one month to one year.

targeted university.

Table 4: Qualitative effects on each targeted university

<p>Lanzhou University of Technology (LUT)</p>	<ul style="list-style-type: none"> <li>· The ratio of classes with experiments became 100% by using the equipment procured under this project.</li> <li>· Before the project, the postgraduate programs had consisted only of master's programs, and few research papers had been internationally published. The equipment procured under this project served as the main equipment in setting up doctoral programs and increased the number of internationally-published papers every year.</li> <li>· The relationship that had existed from before this project between the School of Civil Engineering and universities in Japan in the field of structural engineering (antiseismic and seismic isolation technologies) was strengthened after the training provided in Japan under this project. After the Great Sichuan Earthquake, the teacher who had communicated with the Japanese side and attended the training program under this project played a central role in evaluating the seismic capacity of building structures and designs of earthquake-resistant or base-isolated buildings in Gansu Province.</li> <li>· The School of Fluid Power and Control Engineering used the equipment procured under this project as the main equipment at the testing center for hydraulic pumps and the fluid pressure laboratory that it newly established. Their research outcomes, such as a petroleum pump developed through technical assistance to a company, received awards from Gansu Province and Lanzhou City. Also, academic exchanges with Japanese universities started from the training in Japan, and as part of such exchanges the university hosted a national level forum for enhancing exchanges among researchers in fluid power in China and Japan in 2008.</li> </ul>
<p>Lanzhou Jiaotong University (LZJTU)</p>	<ul style="list-style-type: none"> <li>· Shortage of experimental equipment was solved through the procurement, updating and replacement of basic equipment for teaching.</li> <li>· The facilities and equipment were used for practical education and promotion of innovation. In recent years, students are actively entering competitions and winning prizes.</li> <li>· The School of Civil Engineering took part in national key research projects using the equipment procured under this project (e.g. study of durability of materials for the Qinghai-Tibet railways and development of the Lanzhou-Chongqing railways) and won prizes. The training in Japan also contributed to such research.</li> <li>· A teacher at the School of Chemical and Biological Engineering was engaged in research in the field of super-molecular chemistry for one year in Japan, and after his return to LZJTU produced more than 100 research papers, one of which was published in the Journal of Organic Chemistry of the United States. He is continuing the academic exchange with the host university in Japan.</li> </ul>
<p>Northwest Normal University (NWNNU)</p>	<ul style="list-style-type: none"> <li>· NWNNU had generated ethnic minority teachers from before this project. In 2004, it established the Research Center for the Educational Development of Minorities, and used the equipment procured under this project to train students to be teachers.</li> <li>· Currently, the ratio of students for teacher training to those for non-teacher training is set at 1:1 and research is being promoted. The equipment procured by the College of Chemistry and Chemical Engineering played a role in setting-up new laboratories such as the key laboratory of Ministry of Education in the field of polymer chemistry. Some research or social service outcomes have already been put to practical use (e.g. improvement of alkaline soil in the Silk Road region and technical transfer to companies in Fujian Province.)</li> <li>· In the training component, all teachers stayed in Japan for one year in order to be deeply involved in research. The consequent research outcomes include the increasing number of SCI-cited research papers that had been very few before the project, involvement in key national research projects and obtaining patents, in such fields as chemical engineering and life science. A teacher of the College of Psychology conducted a joint research with her counterpart in the host university in Japan, and they co-authored a book published in Japan. They are continuing their academic exchange.</li> </ul>
<p>Lanzhou University of Finance and Economics (LUFEE)</p>	<ul style="list-style-type: none"> <li>· The ratio of classes with experiments increased to 97% using the basic teaching equipment procured under this project.</li> <li>· Many graduates are employed by leading companies in Gansu Province (mostly in the finance and banking sectors) and contribute to the promotion of a market economy.</li> <li>· Teachers are engaged in research in the fields that they studied in Japan after their return to LUFEE (School of Information Engineering, School of Accounting). A teacher at the School of Business Media extended his stay in Japan at his own expense. He studied production of animations and gained an understanding of Japanese culture.</li> <li>· Many of the equipment procured under this project (e.g. PCs) became obsolete quickly and some</li> </ul>

	<p>of them have already been replaced using the university's own funds. After replacement, old machines are disassembled by students studying information engineering in order to obtain hardware skills. In such manner, all equipment are utilized until the very end of their useful lives.</p>
Lanzhou University (LZU) (Medical School)	<ul style="list-style-type: none"> <li>· The Medical School established the Key Laboratory of Preclinical Study for New Drugs in Gansu Province using the equipment procured under this project such as analytical instruments in the field of molecular biology and electron microscopes, and has expanded the laboratory using the university's own funds. Consequently, development of new drugs was promoted and new patents were granted.</li> <li>· It also established the Research Center to share a transmission electron microscope (JEM) and a scanning electron microscope (JSM). Consequently, the equipment are frequently used.</li> </ul>
Gansu Agricultural University (GAU)	<ul style="list-style-type: none"> <li>· The GAU's microscopes had been procured in the 1970s-80s, and many of them had become usable before the project. The project added microscopes and resolved the shortage, and the ratio of classes with experiments rose to 97% by the time of project completion. The ratio reached 100% after the project.</li> <li>· GAU is preparing to share the equipment procured under this project within the entire university through the development of an equipment management network.</li> <li>· Although not fully attributed to this project which procured basic equipment for teaching, some research outcomes that used such equipment have already been put into practical use (e.g. cold-resistant varieties of field mustard and improved varieties of corn are cultivated by farmers).</li> <li>· The majority of graduates are active as agricultural technologists in project units<sup>17</sup> in townships and villages.</li> </ul>
Gansu College of Traditional Chinese Medicine (GCTCM)	<ul style="list-style-type: none"> <li>· With a comprehensive set of equipment procured under the project, the Animal Laboratory started to provide SPF (specific pathogen-free) animals to the northwestern region.</li> <li>· The teaching and research environment greatly improved comparing before and after the project. Teachers had never imagined before the project that GCTCM would take part in national research projects. The Research Center developed by the project was designated as a key laboratory by Ministry of Education and the Education Board of Gansu Province.</li> <li>· A vice president who attended the university management course applied, after his return, many things he learned for improvement of university management.</li> <li>· GCTCM contributes to development of new drugs through producing graduates who are employed by pharmaceutical companies in the province.</li> </ul>
Tianshui Normal University (TSNC)	<ul style="list-style-type: none"> <li>· TSMC was upgraded to a university from a tertiary short-cycle school just before this project, and faced the need to provide the modern physics course. The project developed the necessary facilities and equipment, and TSMC has become the only university with undergraduate programs in Tianshui City.</li> <li>· The College of Life Science established the Key Laboratory for New Molecule Materials Design and Function, partly using the equipment procured under this project. Besides teaching, the laboratory conducts testing services for external clients such as testing or the geological analysis of the Maijishan Grottoes.</li> <li>· Most graduates have become teachers in rural areas. As 30% of teachers in basic education in Tianshui City are graduates from TSNC, it has contributed to the upgrading of basic education in the city.</li> <li>· Having been enlightened by the concept of focusing on practice, a teacher who attended the university management course established a graduates' association to facilitate graduates to make donations and provide opportunities for practical training in companies. Also, he started to conclude his classes with a 5-minute question and answer sessions.</li> </ul>

Sources: JICA, "The Supervision Survey Report on JICA Loaned Higher Education Project", 2010; responses to the questionnaire and interviews; websites; etc.

<sup>17</sup> A project unit is similar to an incorporated administrative agency or a government-affiliated corporation in Japan.



Ethnic minority students conducting experiment. They will become teachers in rural areas. (NWNNU)



A scanning electron microscope. The researcher explained that it was very frequently used. (Medical School, LZU)



Usage and inspection records of an instrument at the Modern Physics Laboratory. There seemed to be data entry (i.e. usage) every day. (TSNC)

## (2) Use of the procured equipment

By the time of the ex-post evaluation, nearly seven years had passed since majority of the equipment procured under this project was installed. Therefore, some PCs and monitors have passed their useful lives and have already been disposed of in accordance with the university regulations. However, it was confirmed from the visits to and interviews with the targeted universities that most of the other major teaching/research equipment was still used in good conditions and effective at the time of the ex-post evaluation.

Moreover, the stance to fully utilize the equipment until the very end of their lifetime was observed in several universities. For example, teachers and students exercised their ingenuity in using equipment for which components were no longer in production, which became a part of the educational process (e.g. microwave interferometer of LZJTU). In another example, PCs that were procured by this project but then later became obsolete and replaced by new ones were disassembled by students in information engineering classes in order to obtain hardware skills (LUFU).

## 3.3 Impact

### 3.3.1 Intended Impacts

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

Table 5 shows selected higher education indicators at the provincial level. Improvement is seen in the indicators for quantitative expansion such as the number of students and enrollment ratios, to which this project is partly involved through the expansion of the facilities and equipment at the eight targeted universities.

On the other hand, school building area per student which represents qualitative improvement does not show an increasing trend in the province taken as a whole. Although the same indicator at the targeted universities were above the provincial average both before and after the project and showed an increasing trend, its effects on improvement of the figure in the entire province, where there are 37 HEIs (including 14 universities), was limited, and there is a possibility that past investments may have been concentrated on the targeted universities of this

project. Nevertheless, given the fact that the targeted universities are all leading universities in Gansu Province, the upgrading of teaching and research level at these universities as shown in Table 4 could be considered as the upgrading of teaching and research level of the entire province.

Table 5: Higher education indicators of Gansu Province

	Actual 2000	Planned 2005	Actual 2005	Actual 2009	Actual 2011
Number of HEIs	18	30	33	39	37 (of which universities with undergraduate programs: 14)
Number of students enrolled in HEIs	1313,600	210,000	222,605	356,201	405,306
Enrollment rate in HEIs	6.7%	10.0%	N.A.	21% (national average: 24.2%)	23% (national average: 26.9%)
School building area per student (m <sup>2</sup> /person)	27.7 (average of targeted universities: 31.0)	32.0	N.A.	N.A.	12.0 (average of targeted universities: 56.0)

Sources: JICA appraisal documents; JICA, “The Supervision Survey Report on JICA Loaned Higher Education Project”, 2010; China Statistical Yearbook 2011; Educational Statistical Yearbook of China 2011; Gansu Province Statistical Yearbook 2011

(2) Contribution to promotion of market-oriented economic reform, reduction of disparity, development of rural areas and reform of state-owned enterprises

The titled impacts were expected in the ex-ante evaluation. Although the information was limited to the results of the interviews with the executing agency and individual targeted universities and observations, they are considered to have been achieved to a certain extent through production of graduates in the key industries, promotion of research and development (R&D), fostering of teachers for rural areas, and training for laid-off workers.

1. Promotion of market-oriented economic reform: the number of graduates in the fields of accounting, law and financial management increased by between 100 and 500 persons in all targeted universities except GCTCM (whose area of specialization is not very relevant to this subject). Only TSNC confirmed the direct relationship between those graduates and this project, but LUFÉ seems to play a role in this respect as well through use of the facilities and equipment developed and teachers’ training in Japan under this project.
2. Reduction of disparity: among the targeted universities, only LUT and TSNC said that the project directly contributed to human resource development in the key industrial sectors designated by the 10<sup>th</sup> 5-year Plan (see “3.1 Relevance”). LUT fosters human

resources in petrochemical industry, metallurgy, mechanical and electronic industry, light spinning and food, and construction materials, and TSNC does so in the mechanical and electronic industry. Apart from these two universities, other targeted universities that installed educational facilities/equipment in relevant schools/disciplines and which confirmed the enhancement of students' practical skills as a result of this project, such as the Medical School of LZU and GCTCM that produced graduates who then took jobs at drug manufacturers in the province, may also have made a similar level of contribution. In each targeted university, the job placement rate remained around 70-90% in both 2005 (during project implementation) and 2011 (after project completion). Also, it was observed in several targeted universities that the research outcomes involving the outputs of this project were put into practical use in some key industries<sup>18</sup>.

3. Development of rural areas: in NWNNU and TSNC, graduates who received the upgraded education through better experimental conditions later became teachers in rural areas (the number of graduates who became rural teachers amounted to: 1,601 persons in 2005 and 1,522 persons in 2009 in NWNNU, and 1,620 persons in 2005 and 2,680 persons in 2009 in TSNC). In addition, many graduates from GAU obtained their jobs related to rural development in townships and villages. The university also contributed to rural areas through research and development activities, namely, in the field of breed improvement technologies of agricultural products such as field mustard, corn and potato that have already been disseminated.
4. Support to reform of state-owned enterprises (addressing the issue of laid-off workers): three targeted universities said they used the facilities constructed under this project to train laid-off workers. The number of laid-off workers trained at these three universities is increasing, though relation to this project is not clear.

### 3.3.2 Other Impacts

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

No negative impacts were observed. By the time of the ex-ante evaluation, 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 Gansu 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. All universities reported that

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<sup>18</sup> As for the issue of disparity, however, it was stated in "3.1.2 Relevance to the Development Needs of China" that the gap in per capita GDP between Gansu Province and the national average has not been narrowed due to the nation-wide economic development.



during the construction phase they controlled the noises, etc. and thus kept the negative effects at a minimum.

### (2) Land acquisition and resettlement

As planned in the ex-ante evaluation, there was no land acquisition and resettlement associated with this project.

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

It was observed in several targeted universities that academic exchanges with universities in Japan have been enhanced through this project. However, in many cases contact was lost in a few years after the training under this project. Around five out of 34 ex-participants in the training interviewed for this ex-post evaluation have somehow maintained the exchanges. Three of them had active exchanges from before this project (School of Civil Engineering of LUT) or further developed the exchanges by extending their stays in Japan with funding by the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labor and Welfare for doctoral degree or continuing research (LZJTU the College of Chemistry and Chemical Engineering of NWNNU). Feedback about difficulties in continuing exchanges includes the language barrier (GAU) and lack of the particular field of study that the potential participating teachers were interested in at such universities that could accept teachers from China (Medical School of LZU).

Basically, it was each targeted university's responsibility to find host universities in Japan and arrange for the training by communicating with them individually. However, many universities could not find their partners in the initial stage of the project. To respond to such situation, JICA provided various support such as holding of workshops to promote exchange with participation by targeted universities of the Higher Education Projects and interested Japanese universities in 2004 and thereafter, opening of the Higher Education Projects website to share information among participants in the Projects from 22 provinces as well as Japanese universities, and setting up of the help desk by hiring consultants. Despite those efforts the number of participants in the training was far below the planned number (see "3.4 Efficiency"). In some cases where the ex-participants said they could not study what they really wanted to, all participants from the same Chinese university studied in the same Japanese university due to the relationship which their university had with that Japanese host university from before the project. These cases indicate the importance and difficulty of matching the fields of study.

The outcomes of individual cases of exchange are described in Table 4. 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 had a better understanding of Japan. There was also a case where an ex-participant sent his students to doctorate programs in Japan.

This project has largely achieved its objectives, therefore its effectiveness 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 2). The hardware outputs (facilities and equipment) were developed mostly as planned with some differences as follows:

- Building construction: floor area increased by 107% compared to the plan mainly due to the increase in demand.
- Procurement of equipment: it is difficult to precisely compare the actually-procured equipment with the original plan prepared in the project appraisal stage, because detailed consideration and final selection took place after the commencement of the project. However, the colleges/disciplines to which equipment were installed and the major equipment items installed were mostly in accordance with the plan.

As for the software outputs (i.e. training of teachers at the targeted universities in Japan or invitation of teachers from Japan), adjustments were made due to financial constraints and difficulties in finalizing host universities in Japan. Accordingly, the actual number of participants were 114 persons compared to the planned 176 persons (65% of the plan), and the actual person months was 415 person months compared to the planned 1,137 person months (36% of the plan).



Teaching Building constructed using funds from the Chinese side (GCTCM)



Fluid experiment system (LUT)



Microscopes for undergraduate students. The necessary number was secured. (GAU)

### 3.4.2 Project Inputs

#### 3.4.2.1 Project Cost

As shown in the table below, the total project cost was 7,347 million yen (of which the Japanese ODA loan was 4,280 million yen), which was within the plan (ratio against the plan: 95%). The major reasons for the increase or decrease in each cost item are as follows:

- Building construction: although the cost increased due to the increase of the floor area and prices of materials, the increase was more or less proportional to the increase in the outputs and thus considered to be appropriate.
- Equipment: the cost (in foreign currency) slightly increased as the contract amount exceeded the estimates made in the appraisal.
- Training: the cost decreased due to the shortening of the training period as mentioned above.

Table 6: Planned and actual project costs

Unit: million yen

	Plan (appraisal)			Actual		
	Foreign currency	Local currency	Total	Foreign currency	Local currency	Total
1. Building construction	0	2,385	2,385	0	2,628	2,628
2. Equipment	4,179	515	4,694	4,180	439	4,619
3. Training	197	0	197	100	0	100
4. Price contingency	67	5	72	0	0	0
6. Physical contingency	222	145	367	0	0	0
Total	4,665	3,050	7,715	4,280	3,067	7,347

Sources: JICA appraisal documents; project completion report; responses to the questionnaire

Note: The exchange rates applied were: (planned) 1 yuan=15 yen; (actual) 1 yuan=14.17 yen.

#### 3.4.2.2 Project Period

As shown in Table 7, the actual project period was 91 months, which was significantly longer than the planned 36 months (ratio against the plan: 253%) due to the following reasons:

- Building construction: although both tender and construction was progressing smoothly, the project activities were suspended during the period from April to September 2003 to avoid the spread of SARS, which caused a delay.
- Equipment: the process was significantly delayed mainly because it took time for adjustments made on the list of equipment to be purchased and the finalization of specifications, and some contract negotiations failed due to factors such as price increase.
- Training: the process was significantly delayed due to difficulties in selecting and contacting host universities as well as SARS.

Table 7: Planned and actual project periods

	<b>Plan (appraisal)</b>	<b>Actual</b>
Signing on Loan Agreement	March 2002	March 2002
Building construction	September 2003	July 2004
Procurement of equipment	December 2004	September 2009
Training	March 2005	December 2008
Project completion (lengths of months)	March 2005 (36 months)	September 2009 (91 months)

Sources: JICA appraisal documents; project completion report; responses to the questionnaire

### 3.4.3 Results of Calculations of Internal Rates of Return (IRR)

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 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 ex-ante evaluation, the facilities and equipment developed under this project are operated and maintained by each targeted university, and the Education Bureau of Gansu 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. 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. Also, some universities such as GCTCM send laboratory staff to training in operation and maintenance in order to maintain the necessary skills level.

### 3.5.3 Financial Aspects of Operation and Maintenance

The targeted universities are all overseen by the government of Gansu Province except

Lanzhou University (that merged Lanzhou Medical School, a targeted school of this project) that is under the Ministry of Education. Their budgets consist of subsidies from the state or province and own income such as tuitions and fees. The provincial budget is generally in an increasing trend, and expenditures to the education sectors are also increasing (Table 8).

In all targeted universities, cost for operation and maintenance of the facilities and equipment is part of the university budget and managed under standardized procedures. Normally, certain amount of the operation and maintenance budget is allocated from such expense items as operating expenses. Also, laboratories spend part of the laboratory operating expenses, research fund and income from social services (e.g. consulting services) for routine maintenance of equipment. Revenues are constantly increasing in all targeted universities, and operation and maintenance expenses are stable (Table 9)<sup>19</sup>. In the interviews for the ex-post evaluation, both management and laboratory-level staff of all targeted universities said that the necessary amounts of operation and maintenance cost were secured.

Table 8: Budget of Gansu Province

	Unit: billion yuan		
	2009	2010	2011
Fiscal revenue	60.40	74.52	93.36
Fiscal expenditures	124.63	146.86	179.11
of which, total expenditures in education	20.64	22.82	28.43
Higher education	N.A.	N.A.	6.09
Higher education expenditure per student (yuan)	N.A.	N.A.	15,026

Source: Gansu Province Statistical Yearbook 2011  
 Note: The revenue only includes provincial fiscal revenue. Deficits are compensated by the central government.

Table 9: Operation and maintenance expenditures related to this project

	Unit: thousand yuan		
	2009	2010	2011
LUT	97	110	121
LZJTU	87	87	87
NWNU	N.A.	N.A.	N.A.
LUFE	88	88	88
LZU	57	98	118
GAU	18	21	22
GCTCM	14.5	17.3	19.6
TSNC	19	18	18

Sources: Responses to the questionnaire; "The Supervision Survey Report on JICA Loaned Higher Education Project", 2010

### 3.5.4 Current Status of Operation and Maintenance

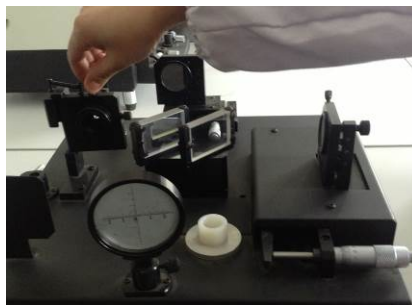
In all targeted universities, the equipment developed by this project are registered in the maintenance and management database. Based on observation and review of usage or inspection records, it was confirmed that the equipment were mostly in good condition. A user of equipment must record the usage as well as the conditions of the equipment every time they use it.

Most of the laboratories which were visited had posted the operational procedures and maintenance plan for each instrument on the wall or in a place easily seen by users, and such procedures seem to be well followed. Also, it was observed that for sensitive equipment, the

<sup>19</sup> The evaluator confirmed, through the data provided through the questionnaire, that the revenues and expenditures of each university were at surplus or balanced in recent years.

environment of the laboratories was managed by recording room temperature and humidity.

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. Spare parts of some equipment are no longer produced, but teachers and students devise ways to utilize it.



A microwave interferometer. Spare parts are not produced anymore, but teachers and students devise ways to utilize the instrument (LZJTU)

No major problems were observed in the operation and maintenance system, and therefore sustainability of the project effect is evaluated to be high.

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

### 4.1 Conclusion

This project aimed to improve teaching and research at eight major universities in Gansu 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 Gansu 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 production of teachers for rural areas. 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 delays in the determination of training host universities in Japan, delays in procurement of some equipment, as well as external factors such as SARS. 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

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.

#### 4.2.2 Recommendations to JICA

To take advantage of the relationship that have been cultivated through this project, it could be effective to update the Higher Education Projects website even with respect to the completed projects as much as possible (e.g. reports on exchange after the project completion), so that it would serve as a focal point for continuing and expanded exchange for universities in China and Japan.

#### 4.3 Lessons Learned

##### (1) Effectiveness of the training component

In the area of assistance in higher education, in addition to assistance in hardware, it is effective to provide software-type assistance (such as teachers' training) in a way that is responsive to existing needs. Past higher education assistance projects have proven effectiveness in training on individual fields of teaching and research, and this was also confirmed in this project. In addition, university management courses such as the ones implemented under this project could be effective even in short training periods, if participants are selected who are candidates for executive positions and have potential to extend the outcomes and based on careful planning by the host universities as was the case in this project.

##### (2) Indicator setting for evaluation

In this project, as well as in other Higher Education Projects in China by Japanese ODA loans, although it was targeted to a limited number of universities (and particular facilities/equipment and teachers of those universities), many effectiveness indicators were ones which measure provincial-level situations (such as aggregated education indicators of the province) or indicators which measure aspects beyond the direct benefits of the project. This ex-post evaluation used those indicators to evaluate Impact. In order to measure the net effect of the project, the ex-ante evaluation should distinguish indicators that measure direct outcomes and indicators that do not measure.

End

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

Item	Original	Actual
1. Project Outputs	Target: 8 universities in Gansu Province	Target: same as planned
(a) Hardware		
i) Building construction	7 buildings such as research building; total floor area of 113,220 m <sup>2</sup>	7 buildings; total floor area of 121,242 m <sup>2</sup>
ii) Procurement of educational equipment	Physics, chemistry, biology, architecture, pharmaceuticals, multimedia, PCs, etc.	Areas of education: same as planned Total 10,576 items
(b) Software		
Teachers' training in Japan or acceptance of experts from Japan	Total 176 persons (including 5 experts from Japan)	Total 114 persons from 42 Japanese universities or institutions (experts from Japan: none)
2. Project Period	March 2002 – March 2005 (36 months)	March 2002 to September 2009 (91 months)
3. Project Cost		
Amount paid in Foreign currency	4,665 million yen	4,380 million yen
Amount paid in Local currency	3,050 million yen (203 million yuan)	3,067 million yen (216 million yuan)
Total	7,715 million yen	7,347 million yen
Japanese ODA loan portion	4,665 million yen	4,380 million yen
Exchange rate	1 yuan = 15 yen (As of September 2001)	1 yuan = 14.17 yen (Average between 2003 and 2009)