People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan

"Inland Higher Education Project (Regional Vitalization, Market Economy Reform Support, and Environmental Conservation)" (Inner Mongolia Autonomous Region)

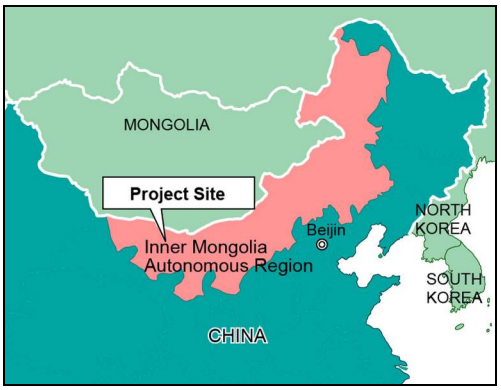
External Evaluator: Naomi Murayama, OPMAC Corporation

0. Summary

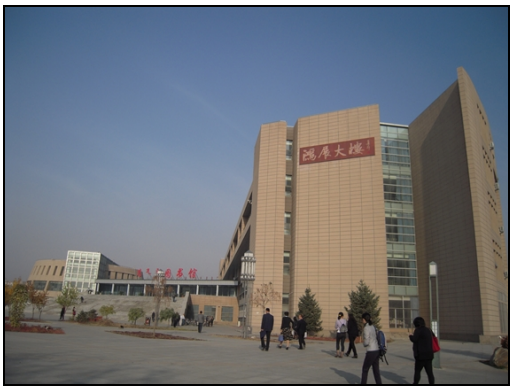
The objective of this project (hereinafter referred to as "the Project") was to improve higher education in the Inner Mongolia Autonomous Region (hereinafter referred to as "IMAR") quantitatively and qualitatively by supporting the construction of buildings, the procurement of equipment and the training of teachers in the target universities. This objective was consistent with China's development plans and development needs at the time of both the appraisal in 2004 and the ex-post evaluation, as well as with Japan's ODA policy at the time of the appraisal; therefore its relevance is high. Although the outputs were essentially completed in line with the initial plans, both the project cost and project period exceeded the plan. Therefore, the efficiency of the Project is fair. The effectiveness and impact of the Project was high because the direct effects of the Project (building areas and monetary value of educational equipment) and the indirect effects of the Project (number of key faculties and laboratories, number of research papers, etc.) have improved. Moreover, there are many cases of good practice in the utilization of buildings, equipment and training supported by the Project. No major problems have been observed in any of the institutional, technical and financial aspects of the operation and maintenance system and its current status is very good; therefore the sustainability of the project effects is high.

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

1. Project Description



Project Location



Library, Inner Mongolia Medical University

1.1 Background

In China, the elementary school net enrollment rate reached 98.7% and the junior high school gross enrollment rate reached 97.9% in 2003. Compulsory education became common and the quantitative needs for higher education have been increasing. In particular, the development of competent human resources able to address development issues such as market economy reform and environmental conservation in inland areas was an urgent issue from the viewpoint of narrowing regional disparities. In the 10th Five-Year Plan for National Economic and Social Development, the Chinese government tackled the quantitative and qualitative enlargement of higher education by aiming at around 15% of the target net enrollment rate in 2005 (13% in 2001).

1.2 Project Outline

The objective of the Project was to upgrade higher education in both quality and quantity for eight important institutes[1] in IMAR by supporting the construction of school buildings, the procurement of educational equipment and the training of teachers in Japan, thereby contributing to regional vitalization, market economy reform and environmental conservation.

Loan Approved Amount/ Disbursed Amount	5,073 million yen / 5,072 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2005 / March, 2005
Terms and Conditions	Interest rate: 1.5% (0.75% for training component) Repayment period: 30 years (40 years for training component) (Grace period: 10 years) Conditions for procurement: General untied
Borrower / Executing Agency	The Government of the People's Republic of China / Inner Mongolia Autonomous Region People's Government

[1] The target universities: 1) Inner Mongolia University, 2) Inner Mongolia University of Nationalities, 3) Inner Mongolia Normal University, 4) Inner Mongolia University of Technology, 5) Inner Mongolia Agricultural University, 6) Inner Mongolia College of Finance and Economy (current Inner Mongolia University of Finance and Economy), 7) Inner Mongolia Medical College (current Inner Mongolia Medical University),and 8) Inner Mongolia University of Science and Technology. Inner Mongolia University of Science and Technology was established in association with Baotou Normal College, Baotou Steel College and Baotou Medical College by approval of the Ministry of Education in June 2003. However, it was fractionalized into three independent corporate statuses, i.e. Inner Mongolia University of Science and Technology, 9) Inner Mongolia University of Science and Technology Baotou Normal College (hereinafter referred to as "Baotou Normal College") and 10) Inner Mongolia University of Science and Technology Baotou Medical College (hereinafter referred to as " Baotou Medical College") at the end of 2004. Therefore, the current target universities consist of ten universities.

Final Disbursement Date	July, 2012
Main Contractor	-
Main Consultant	None
Feasibility Studies, etc.	1. F/S: "Feasibility Study Report" (Inner Mongolia Lianfeng Investment and Loan Consulting Corporation, May 2003) 2. JICA report: 1) "FY 2001 Special Assistance for Project Implementation (SAPI) for a Higher Education Project in China" (August 2003) 2) "Special Assistance for Project Implementation (SAPI) for a Higher Education Project in the People's Republic of China" (March 2004) 3) "SAPI for a Higher Education Project in China" (May 2005) 4) "The Supervision Survey Report on JICA Loaned Higher Education Project" (2010)

2. Outline of the Evaluation Study

2.1 External Evaluator

Naomi Murayama, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: August, 2014- October, 2015

Duration of the Field study: October 19, 2014- November 2,2014

January 13, 2015- January 16, 2015

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

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of China

At the time of the appraisal, China had been admitted to the World Trade Organization (hereinafter referred to as "WTO") in December 2001 and had been aiming at high rates of economic growth and openness and reform through industrial structural adjustment. On the other hand, disparities between coastal and inland areas, and between urban and rural areas, have been issues in China. To address increasing environmental issues, not only government

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

[3] ③: High, ②: Fair, ①: Low

initiatives but also more comprehensive approaches were needed, including human resource development and research on environmental conservation in higher educational institutions. These issues were reflected in the central government and the IMAR government "10th Five-Year Plan for Economic and Social Development" and " the 10th Five-Year Plan for Education" (both from 2001 to 2005). The aims of raising the higher education enrollment rate and the number of higher education students, of addressing industrial structural adjustment (for addressing environmental issues and admission to the WTO) and of strengthening the Western region (including higher education and regional vitalization) were listed in these plans[4].

It was expected that the Project would contribute largely to regional vitalization, market economy reform and environmental conservation by human resource development through supporting tertiary education in one of China's inland areas. The project objectives complied with "the 10th Five-Year Plan for National Economic and Social Development", "the 10th Five-Year Plan for Education", "China Western Development", "the 10th IMAR Five-Year Plan" and "the 10th IMAR Five-Year Plan for Education" at the time of the appraisal.

At the time of the ex-post evaluation, "the 12th Five-Year Plan for National Economic and Social Development" (2011-2015), "the 12th Five-Year Plan for Education", "China Western Development", "the 12th IMAR Five-Year Plan" and "the 12th IMAR Five-Year Plan for Education" have been formulated and have taken over the above mentioned development policies. Moreover, "the National Mid- and Long-Term Reform and Development Plan for the Education Sector (2010-2020)" promoting human development through raising the higher education enrollment ratio have also been formulated by the central government. In line with these plans, China has been promoting human resource development and environmental conservation through higher education institutes for further economic growth, together with further openness and reform.

The focus of higher education policy started shifting from "quantity" to "quality" in these plans. For instance, the IMAR government had aimed at aggressive growth of higher education in the size and development of educational equipment in "the 10th IMAR Five-Year Plan for Education", whereas "the 12th IMAR Five-Year Plan for Education" says that inputs to key faculties and key laboratories have been increased for the enhancement of the content of higher education and the improvement of quality. The project objective has been to improve higher education both quantitatively and qualitatively and reflected China's development policies consistently from the time of the appraisal to the time of the ex-post evaluation.

[4] The "China Western Development" is a development policy of the central government which was formulated in 2000 for enforcement in the western areas.

3.1.2 Relevance to the Development Needs of China

At the time of the appraisal, the quantitative demand for higher education was growing, against a background of an increase in the number of secondary graduates and government policies for an increase in the number of higher education students. In order to address this issue, the enhancement of higher education from the aspects of infrastructure, human resources and finance was needed. The Project supported the enhancement of higher education and therefore it was consistent with the development needs of China.

The number of secondary graduates in IMAR increased from 120.6 thousand at the time of the appraisal (in 2003: baseline = the latest data at the time of the appraisal) to 168.1 thousand in 2011 [5], which exceeds the estimate at the time of the appraisal (growth rate: 39%). In 2013, it was 161.6 thousand (growth rate: -4% in comparison with the figure in 2011) due to sluggish growth in the number of children through the policy of one child per family which was an assumption at the time of the appraisal. On the other hand, the number of tertiary enrollments increased from 94.8 thousand in 2003 to 151.7 thousand in 2011 (growth rate: 60%) and 173.7 thousand in 2013 (growth rate: 83%) over the same period. The growth rates of enrollments in ordinary tertiary institutes[6] (94% in 2011 and 101% in 2013, respectively) are higher than the growth rate of enrollments in tertiary institutes as a whole. This shows that popularization of higher education is progressing in IMAR (Table 1). In light of the above, it can be considered that the demand for tertiary education is still high.

Table 1: Number of Post-secondary Students and Tertiary Enrollments in IMAR

Unit: thousand

year	2003	2005		2008		2011		2013
	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Act.
Post-secondary students	120.6	134.4	136.6	155.1	187.6	162.0	168.1	161.6
Tertiary enrollments	94.8	116.1	105.2	148.2	133.7	158.9	151.7	173.7
Ordinary tertiary enrollments	59.5	73.0	70.9	93.4	107.1	93.4	115.2	119.3

Source: the IMAR Education Department
Notes: Act. = actual, Est. = estimation at the time of the appraisal

The project component and area focused on were also consistent with the development needs of China at the time of the ex-post evaluation. For example, while the enforcement of graduate education has become more and more obvious in China's higher education policies, the educational equipment procured under the Project has been highly utilized, as mentioned later, and met the needs for research and education in graduate schools at the time of the ex-post evaluation. Moreover, environmental conservation, one of the focus areas of the

[5] The comparison was made with the actual in 2011 because the target was set at one year after the completion of building construction at the time of the appraisal.

[6] Higher education institutions (tertiary) include vocational technical schools, short-term higher education, four-year universities, and graduate schools. Ordinary tertiary institutes include only four-year universities and graduate schools. In this report, these indicate institutions excluding graduate schools.

Project, is one of the most important issues in China. Thus, many students want to major in environmental science and the study of environmental science is advantageous for job seekers. The essential idea of the Seminar for Administrators, in which many administrative staff of universities participated through the training component under the Project, meets the needs of the Chinese undergoing education reform, even though the Chinese system is different from the Japanese one.

The target universities are mainly key or unique universities in ethnic education and are universities that have been making efforts to improve the quality of education. As a result, as mentioned later in Effectiveness and Impact, concrete results such as prize-winning research papers have been produced in fields with high development needs such as the environment sector. It can be considered that the selection of the target universities is also relevant.

3.1.3 Relevance to Japan's ODA Policy

Japan's ODA Charter at the time of the appraisal placed importance on assistance in the Asian region and assistance in human resource development; therefore the project objectives were consistent with Japan's ODA policy.

Furthermore, the Country Assistance Program for China, the Medium-Term Strategy for Overseas Economic Cooperation Operations and the Country Assistance Strategy for China at the time of the appraisal placed significance on human resource development from the viewpoint of support for openness and reform (market rules), environmental conservation, and regional vitalization (including progress in Japan-China exchange). The project objectives were therefore also consistent with Japan's aid policies.

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

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The Project included a hard component (the construction of school buildings and the enhancement of educational and research equipment) and a soft component (the training of personnel from the target universities in Japan). The outputs of each component are as follows (Table 2):

Table 2: Comparison of Outputs (planned and actual)

Items	Planned	Actual (achievement rate)
Buildings	6 universities total:192,531 m^2	7 universities total: 166,644 m^2 (87%)
Equipment	7 universities	9 universities: mostly as planned
Training	8 universities total:153 staff	10 universities total: 187 staff (122%)

Source: documents provided by JICA for the planned, responses to the questionnaire for the actual data

The total actual floorage of school building construction was 87% of the planned area as the educational building of Inner Mongolia Medical University was constructed not under the Project but using the University's own funds. The school buildings of the other target universities were constructed mostly as planned although floorage was slightly expanded or decreased depending on the needs of each university.

There is no big difference between the plan and the actual in the other target universities, although the model was changed for some of the digital equipment due to production ending during the process of procurement.

The reason why the school building of Inner Mongolia Medical University was not constructed under the Project, was that there was a need for the development to be completed before the "Undergraduate University Teaching Level Evaluation" [7] conducted by the Ministry of Education of China[8].

As regards the training component, short-term (from three months to half a year) training in specialized fields which mainly suited the project purpose, such as environmental conservation, was expected at the time of the appraisal. In fact, there were many participants not only in the short-term training in specialized fields but also in the Seminar for Administrators (around two weeks). The Education Department of IMAR promoted short-term training from the beginning of the Project since it wanted to have the opportunity to expose as many educational staff as possible to advanced education in Japan. Some teaching staff were forced to give up taking a training course in their specialized fields due to difficulties in contacting host institutions in Japan because of a lack of connections with universities or research institutes in Japan. On the other hand, the actual number of participants in training was 122% of that planned because of participation in the Seminar for Administrators by Kobe University arranged by the Education Department. Although it is difficult to compare the difference between the plan and actual for the number of trainees and content of training, it can be said that the training component was generally implemented as planned.

[7] The evaluation system for higher education introduced by the Ministry of Education of China. Once every five years, school operations and the quality of education are evaluated. The first phase of evaluation was conducted from 2003 to 2008. The results are evaluated on a four-point scale. "Excellent University" is the highest rating.

[8] The Ministry of Education is one of the central government organizations of China, corresponding to the Ministry of Education, Culture, Sports, Science and Technology of Japan. On the other hand, the Department of Education (or Education Department) is one of the provincial government organizations.

3.2.2 Project Inputs

3.2.2.1 Project Cost

Actual project costs amounted to 9,028 million yen (of this, the actual loan disbursement amounted to 5,072 million yen[9]) against the estimated costs of 8,309 million yen (of this, the planned loan amounted to 5,073 million yen). The actual costs were higher than planned (109%). The reasons for this are: 1) the rising costs of labor and building materials due to the construction rush for the Beijing Olympics which came at the same time as school building construction, and 2) exchange rate fluctuations and goods inflation in equipment procurement. Some equipment was updated to the latest models. In the light of this, the scope can be said to have been counterbalanced by increase and decrease. Therefore, the evaluator evaluated the efficiency of the project cost by a simple comparison between the plan and the actual (109%).

3.2.2.2 Project Period

The project period planned at the time of the appraisal was 61 months, or from March 2005 to March 2010. The actual project period was 87 months, or from March 2005 to June 2012, which was longer than planned: equivalent to 143% of the original plan. The reasons for the delays are as follows:

1) The Education Department and target universities were not familiar with the international procurement procedures at the commencement stage of the Project;
2) It was difficult to implement the construction works due to the cold winter weather of Inner Mongolia;
3) In relation to the above 1), it took time to re-arrange the procurement list and to recreate bid documents as some equipment had already been purchased with other funds due to the fact that the procurement procedure was taking too long. It was therefore necessary that a change was made to other necessary equipment; and
4) Acceptance of trainees by host institutions took a certain amount of time, especially just after commencement of the Project, due to the difficulties in contacting them, as candidate trainees, except in some of the target universities, did not have any connections with universities or research institutes in Japan.

Project completion was defined as the completion of three components of the Project at the time of the appraisal. In the case of this project, project completion was June 2012 as university staff participated in the Seminar for Administrators for two weeks in June 2012.

After this delay in the procurement procedure, the Education Department of IMAR succeeded in shortening the procurement period drastically by making the efforts to

[9] According to data provided from the executing agency, this was JPY 5,073 million. This is because of a rounding error.

modify the clarification procedure of the procurement list from individual interviews at each university to short-term group interviews carried out in one place.

3.2.3 Results of Calculations of Internal Rates of Return

Due to the nature of the Project, a quantitative analysis of the internal rate of return was not possible.

In light of the above, both the project cost and project period exceeded the plan. Therefore, the efficiency of the Project is fair.

3.3 Effectiveness[10] (Rating: ③)

In this ex-post evaluation study, the evaluator analyzed the quantitative effects using the indicators directly related to the three project components, i.e. building construction, the provision of educational equipment and training. Specifically, for direct effects, the contribution of the Project in increasing the number of students was evaluated by analyzing the areas of school buildings (floorage), the monetary value of educational equipment and the utilization rate of school buildings and educational equipment. For indirect effects, the educational environment was analyzed by floorage per student and the monetary value per student of educational equipment. The contribution made by the Project to aspects of education and research was then evaluated based on the number of key faculties, key laboratories, research papers and so forth. Moreover, for qualitative effects, cases of outstanding research projects and social services were analyzed.

In the ex-ante evaluation, students in the target universities and the higher education enrollment rate in IMAR were set as Operation and Effect Indicators. The former indicator cannot be said to be an effect indicator as there is no component for increasing students under the Project. However, it is regarded as a precondition in order to consider the project effects since it is one of the essential data for evaluation of the project effects. The latter indicator was not utilized in this ex-post evaluation because the development of universities other than the target universities was conducted through the funds of the Chinese side itself whereas the project scope was limited to a part of school buildings, equipment and educational staff in only some of the universities in IMAR in order to avoid misleading the evaluation.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

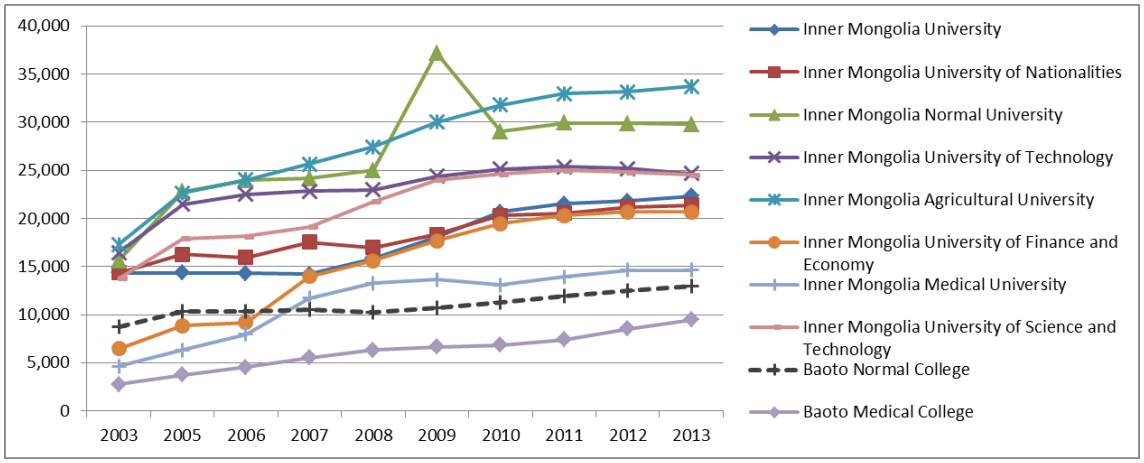
3.3.1.1 Direct Effects

(1) Changes in the number of students

First of all, changes in the number of students are analyzed as a precondition for

[10] The sub-rating for Effectiveness is to be dealt with in consideration of Impact.

considering the direct effects of the Project. In China, the number of higher education institutes and university students has sharply increased since the release of the "Action Plan for Educational Vitalization Facing the 21st Century" in 1998, which aimed at an increase in the university enrollment rate from 9.8% in 1998 to 15.0% in 2010. In the meantime, the number of higher education institutes in IMAR increased from 27 in 2003 to 50 as of 2013. The number of university students also increased, approximately two times, from 260 thousand in 2003 to 520 thousand in 2013. The number of students at the target universities also increased steadily: the growth rate of the student numbers at the target universities was 86% during the same period. The upward trend in student numbers at the target universities can be divided into three phases. The first phase is the phase of intensive development of school buildings and equipment (from 2005 to 2008). The second phase is the phase in which the development was largely completed (from 2008 to 2010). The third phase is the phase of improvement in the quality of education (after 2010). Student numbers increased gradually in the first phase and rapidly grew in the second phase. In the third phase they remained at the status quo (Figure 1). One of the reasons for the rapid growth in the second phase is that universities could receive more students thanks to the development of school buildings and equipment for more students due to the increased budget for higher education allocated by the Project and the Chinese government[11].



Source: Answers to the questionnaire

Figure 1: Trends in student numbers in target universities

When considering cases at each target university, all the universities except for the Inner Mongolia University of Technology had achieved the target[12] as of 2013. The Inner

[11] Explanation of the Chinese side.

[12] The target of each target university is as follows: Inner Mongolia University: 20,020, Inner Mongolia University of Nationalities: 17,925, Inner Mongolia Normal University: 20,280, Inner Mongolia University of Technology:

Mongolia University of Technology explained the reason for failing to achieve the target as follows: The university originally had higher vocational education and undergraduate and graduate education. In 2007, higher vocational education at the Inner Mongolia University of Technology was abolished and the university changed its policy to improve the quality of education by focusing on undergraduate and graduate education. Although the number of students in undergraduate and graduate schools has been steadily rising, the target was not achieved due to the abolition of higher vocational education.

(2) Changes in school building areas

To meet the increase in university students mentioned above (1), each target university constructed teaching and laboratory buildings and so on. The school building areas of most target universities increased drastically. As of 2013, a year after the project completion, most of the target universities had attained the target (Table 3). Since the target of the Inner Mongolia University of Science and Technology includes the building floorage of Baotou Normal College and Baotou Medical College which had been integrated into the Inner Mongolia University of Science and Technology at that time, it seems that the university did not achieve the target. However, the floorage has been increased as much as that of the other target universities. Therefore, the evaluator saw no problem.

Table 3: Changes in school building areas at the target universities

Unit: m^2

	Baseline (2003) 1 Year Before the Appraisal	**Target (2008) 1 Year After Completion**	**Actual (2008)**	**Actual (2013) 1 Year After Completion**	**Growth rate (%) 2003-2013**	**Project area**	**Project share (%)**
Inner Mongolia University	254,019	345,000	254,019	578,882	127.9	0	0
Inner Mongolia University of Nationalities	70,656	138,961	181,475	204,647	189.6	15,161	11.3
Inner Mongolia Normal University	159,316	344,327	481,788	643,208	303.7	18,656	3.9
Inner Mongolia University of Technology	110,017	152,447	265,232	274,712	149.7	31,265	19.0
Inner Mongolia Agricultural University	218,244	284,550	354,554	364,305	66.9	0	0
Inner Mongolia University of Finance and Economy	58,100	101,900	435,717	563,406	869.7	26,359	5.2

25,955, Inner Mongolia Agricultural University: 24,700, Inner Mongolia University of Finance and Economy: 17,830, Inner Mongolia Medical University: 9,946, Inner Mongolia University of Science and Technology: 26,460 (including Baotou Normal College and Baotou Medical College)

	Baseline (2003) 1 Year Before the Appraisal	Target (2008) 1 Year After Completion	Actual (2008)	Actual (2013) 1 Year After Completion	Growth rate (%) 2003-2013	Project area	Project share (%)
Inner Mongolia Medical University	42,144	151,366	172,379	453,591	976.3	23,977	5.8
Inner Mongolia University of Science and Technology	104,050	488,167	213,334	288,348	177.1	25,812	14.0
Baotou Normal College	91,542	191,542	197,346	240,830	163.1	25,414	17.0
Baotou Medical College	46,300	n.a.	200,000	200,000	332.0	0	0

Source: Answers to the questionnaire
Note: Project share＝ the project area of the increased floorage from 2003 to 2013.

The project buildings do not necessarily account for a large share of the building areas of each university. The construction of the school buildings, however, does not only contribute to an honorable appreciation in the Excellent School in Undergraduate University Teaching Level Evaluation to some extent, but also plays an important role in the development of faculties and the enhancement of doctoral programs as the floorage of school buildings and the monetary value of educational equipment are included as part of the criteria of evaluation and accreditation. In each university, for example, in the Inner Mongolia University of Technology, the school building constructed under the Project is the only educational building in its new campus where the students of seven departments out of a total of sixteen departments study and therefore all the students in these seven departments students directly enjoy the project benefits. This shows that the project contribution is higher than the project share (19%) of the building areas.

(3) Changes in the monetary value of educational equipment

The monetary value of educational equipment also increased drastically in most of the target universities (Table 4). The project equipment does not necessarily account for a large share of whole monetary value of educational equipment in each university as is the case with the school building areas. For instance, the growth rate of the monetary value of educational equipment over the last decade in Inner Mongolia University designated as one of the Project 211 [13] is more than 1,000 %. According to Inner Mongolia University,

[13] Project 211 is a national project, named from an abbreviation of “the 21st century” and “approximately 100 universities” respectively. To be designated as Project 211 by the Ministry of Education of the People’s Republic of China means that the university is a at a top level in education, research and management. (Source: Japan Science and Technology Agency China Research Center, 2011, “2010 Current Situation and Trend of Higher Education in China”)

this is attributed to the increase in the national budget to the schools of the Project 211 [14]. However, as mentioned above, in 2007 when the budget for higher education was less sufficient than the current one, the Project contributed to some extent to the granting to all the target universities of the honorable title "Excellent University" in the "Undergraduate University Teaching Level Evaluation". In the "Undergraduate University Teaching Level Evaluation" improvement thanks to equipment procured under the Project in the environment for experiments, students' abilities in experiments the research level were appreciated. Furthermore, the improvement of students' abilities in experiments leads to an improvement in the employment rate of graduates. For example, the Inner Mongolia University of Science and Technology has been accredited as a "National Leading University of the Employment of Graduates".

Table 4: Monetary value of educational equipment

Unit: thousand RMB

	Baseline (2003) 1 Year Before the Appraisal	**Actual (2013) 1 Year After Completion**	**Growth rate (%)**	**Project area**	**Project share (%)**
Inner Mongolia University	32,435.7	445,717.2	1,274.2	36,903.7	8.9
Inner Mongolia University of Nationalities	23,373.6	174,338.6	645.9	23,722.6	15.7
Inner Mongolia Normal University	50,149.7	311,864.5	521.9	19,432.2	7.4
Inner Mongolia University of Technology	82,401.5	246,980.0	199.7	20,799.3	12.6
Inner Mongolia Agricultural University	109,128.9	485,103.7	344.5	35,676.3	9.5
Inner Mongolia University of Finance and Economy	41,362.7	113,119.6	173.5	0	0
Inner Mongolia Medical University	19,650.0	212,152.5	979.7	15,710.3	8.2
Inner Mongolia University of Science and Technology	59,703.7	232,846.7	290.0	14,138.4	8.2
Baotou Normal College	46,130.9	69,549.5	50.8	10,182.5	43.5
Baotou Medical College	11,000.0	87,950.0	699.5	10,300.0	13.4

Source: Answers to the questionnaire

Note: Project share = Project area/(Actual-Baseline). In order to confirm the contribution of the Project to the development after the appraisal.

[14] Refer to the website of Science Portal China for detailed information about the increase in national budget to the schools of the Project 211. Around half of the budget is allocated to the development of school buildings and educational equipment. http://www.spc.jst.go.jp/education/higher_edct/hi_ed_2/2_1/2_1_1.html

(4) Utilization rate of school buildings and educational equipment

As mentioned above, the school building areas and the monetary value of educational equipment increased as each target school quantitatively responded to the increase in students. However, effectiveness cannot be discussed if buildings and equipment are not actually utilized.

According to answers to the questionnaire, the utilization rate of major school buildings has a very high ratio, at 100% in each target university. The utilization rate of major educational equipment is more than 80% in each target university and thus it can be said the educational equipment is sufficiently utilized. In particular, highly utilized equipment in many target universities, such as atomic absorption spectrophotometers, is for both education and research and the utilization rate is 90% to 100%.

One of the reasons for the high utilization rate in the target universities of IMAR is that experts hired for the Project selected equipment which was suitable for research fields and the executing agency procured the latest equipment for those which could be out of date quickly on the bases of the experts' advices..

As considered above, the students, school building areas and monetary value of educational equipment have increased and the utilization rates of school buildings and educational equipment is also high. Moreover, the Project has contributed highly in individual cases. In light of the above, it can be considered that the Project has contributed to direct effects to some extent.

3.3.1.2 Indirect Effects

(1) Floorage and monetary value of educational equipment per student

The Undergraduate University Establishment Standards of China required that the 2006 national standard of floorage per student was $30m^2$ or more[15]. All the target universities except for Inner Mongolia Agricultural University improved from their baselines and have achieved the targets. Although some universities do not achieve the standards of the "Undergraduate University Establishment Standards", these universities have already prepared extension plans. The floorage per student is expected to be improved in the future.

[15] For education and administration buildings at ordinary universities, the floorage per student for departments of science, engineering, agriculture and medicine is $20m^2$ or more, the floorage per student for departments of humanities, social sciences, and management is $15m^2$ or more and the floorage per student for departments of physical education and arts is $30m^2$ or more.

Table 5: Floorage per student

Unit: m^2

	Baseline 2003 Baseline Year	Target 2008	Actual 2012 Completion Year	Actual 2013 1 Year After Completion
Inner Mongolia University	16.2	14.0	26.6	26.0
Inner Mongolia University of Nationalities	4.9	7.7	17.1	17.7
Inner Mongolia Normal University	9.7	15.7	20.2	20.2
Inner Mongolia University of Technology	6.5	5.3	10.7	11.1
Inner Mongolia Agricultural University	12.1	10.5	11.0	10.8
Inner Mongolia University of Finance and Economy	9.0	5.7	29.3	26.8
Inner Mongolia Medical University	8.4	13.9	30.7	30.7
Inner Mongolia University of Science and Technology	7.5	18.1	11.1	11.2
Baotou Normal College	10.5	(19.2)	19.2	18.6
Baotou Medical College	13.2	(28.6)	21.2	19.1

Source: Answers to the questionnaire

Note: The target of the Inner Mongolia University of Science and Technology includes in its figures of Baotou Normal College and Baotou Medical College. The target of Baotou Normal College and Baotou Medical College was set individually after the appraisal.

The above mentioned Undergraduate University Establishment Standards of China has the following requirements: that the monetary value of educational equipment per student for science faculties is not less than RMB 5,000; for literature and social faculties, not less than RMB 3,000; for gymnastic and art faculties, not less than RMB 4,000. Only Inner Mongolia Agricultural University, the Inner Mongolia University of Finance and Economy and Baotou Normal College among the target universities met this requirement before project implementation. After project completion, however, all the target universities met this requirement (Table 6).

Table 6: Monetary value of educational equipment per student

Unit: RMB

	Baseline (2003) Baseline Year	Actual (2008)	Actual (2013) 1 Year After Completion
Inner Mongolia University	2,261.12	8,120.43	19,989.56
Inner Mongolia University of Nationalities	1,629.27	4,241.36	8,162.30
Inner Mongolia Normal University	3,214.00	7,925.00	10,480.00
Inner Mongolia University of Technology	4,594.63	5,348.54	8,829.30
Inner Mongolia Agricultural University	6,142.74	8,478.01	13,795.86
Inner Mongolia University of Finance and Economy	6,417.80	2,940.16	5,374.62
Inner Mongolia Medical University	2,088.87	4,076.88	12,295.27
Inner Mongolia University of Science and Technology	4,334.84	5,939.78	9,491.16

	Baseline (2003) Baseline Year	Actual (2008)	Actual (2013) 1 Year After Completion
Baotou Normal College	5,295.10	5,301.00	5,372.00
Baotou Medical College	n.a.	6,372.00	9,104.00

Source: Answers to the questionnaire

The increase in monetary value of educational equipment per student means not only the increase in educational equipment available for students but also improvements in the quality of educational equipment available for students. More and better equipment contributed to improvement in the quality of education and research to some extent as well as to a wide improvement in the experiment environment for students (Box 1).

In light of the above, it can be said that the educational environment is on the road to being improved.

Box 1: Results of beneficiary survey – beneficiaries of school buildings and equipment -

A questionnaire survey targeting the beneficiaries of the school buildings and equipment developed under the Project was conducted. The respondents were school staff (teaching staff: 39, administrators: 6 and others: 1) and students (99), a total of 144 (male: 83 (58%), female: 61 (42%))[16]. Questionnaires were distributed through the IMAR Education Department to each target university. The answers from the beneficiaries were collected by the universities. The contents consist of questions on sufficiency level, satisfaction level, and effects of school buildings and educational equipment.

The results of this survey show that the satisfaction level of the school buildings and equipment developed under the Project is high and that many beneficiaries note improvements in the quality of education and research.

1. Do you know what the school buildings constructed under the Project are?

More than 70% of the respondents know what the equipment procured under the Project are (the awareness is high.). As for the question whether you know that the equipment was supported by Japan, the respondents of Yes are 79 (57%) and the ones of No are 60 (43%). A considerable number of respondents recognize the support of Japan.

Do you know what the school buildings constructed under the Project are?

	Head-count	%
Yes	103	74
No	37	26
Total	140	100

2. Are you satisfied with the equipment procured under the Project?

Are you satisfied with the equipment procured under the Project?

	Head-count	%
Satisfied very much	27	20
Satisfied	86	63
Neutral	18	13
Not satisfied very much	4	3
Unsatisfied	0	0
Unknown	2	1
Total	137	100

[16] As one of the respondents marked both teaching staff and administrator, these figures add up to 145.

The satisfaction level differs depending on the equipment utilized and the research fields. But the respondents who answered very satisfied and satisfied account for more than 80% of the whole. The major reasons for satisfaction are as follows:

- It basically meets my need in the functional aspect.
- It is easy to use.
- The first computer cluster has been introduced in our university and it enables us to do unprecedented high-performance computation.
- It supports learning. And it is useful to measure and analyze samples.
- It is internationally one of the most advanced pieces of equipment in my research field and the figures measured by the equipment are accurate. Furthermore, the equipment is durable and practical.
- As the resolution of image is high, it is useful for analysis.
- It is sophisticated and durable. (Its failure rate is low.)

The major reasons for not being satisfied very much are as follows:

- It is a little old. It has a relatively large margin of error.
- Performance of some equipment does not reach the required level in experiments.
- Imperative peripherals are not procured. I hope to procure the necessary equipment with more funds.

3. Is the experimental equipment sufficient for students?

Is the experimental equipment sufficient for students?

	Head-count	%
Too much	2	1
Sufficient	74	53
Insufficient	42	30
Not sufficient at all	6	4
Unknown	16	11
Total	140	99

Note: Percentage total is not 100% due to rounding error.

More than half the respondents answered “sufficient” while those answering “insufficient” account for 30%. Many of the reasons for “insufficient” seem to express their expectations of further procurement of equipment by listing equipment they wish for and complaining about equipment being insufficient in comparison with other universities. Meanwhile, some of the respondents point out insufficiency of peripheries and experimental equipment for students.

4. (for students) Do you think the quality of education has been improved by the teaching staff’s utilization of equipment procured under the Project?

Improvement in classes by utilization of equipment procured under the Project

	Head-count	%
Improved very much	21	21
Improved	64	65
Neutral	5	5
Rather deteriorated	0	0
Unknown	9	9
Total	99	100

The respondents of “improved very much” and “improved” account for more than 80%. No one responded “deteriorated”.

5. (for teaching staff) Were your research needs reflected adequately in the selection of the educational equipment?

Reflection of research needs in the selection process of educational equipment

	Head-count	%
As there was a reflecting process of needs, my research needs were reflected.	35	78
Although there was a reflecting process of needs, my research needs were not reflected.	7	16
As there was no reflecting process of needs, my research needs were not reflected.	0	0
Others	3	7
Total	45	101

Note: Percentage total is not 100% due to rounding error.

Seventy eight percent of the respondents answer that their research needs were reflected as there was a reflecting process of their needs. According to their reasons for selecting the answers, it can be considered that the efforts for reflecting their research needs were basically made in one way or another at the selection stage, although one person answered that he did not get involved in the selection process. Although there is some equipment which does not sufficiently meet research needs at this moment, in many cases, research needs could be reelected at the time of selection.

6. Are you satisfied with the school buildings constructed under the Project?

Are you satisfied with the school buildings constructed under the Project?

	Head-count	%
Satisfied very much	25	19
Satisfied	88	66
Neutral	14	11
Not satisfied very much	1	1
Unsatisfied	0	0
Unknown	5	4
Total	133	101

Note: Percentage total is not 100% due to rounding error.

More than 80% of the respondents are satisfied. Some have the opinion that the school buildings constructed under the Project helped to ease the shortage of floorage and so forth. The reason for "not satisfied very much" is not known. In the universities that the respondents of "unknown" belong to, school buildings were not constructed.

(2) Changes in the number of key faculties and key laboratories

In China, since "Some Opinion Concerning the Development of Higher Education Institutions and Key Faculties" was proclaimed by the State Education Commission in 1993, the state or provincial governments have designated faculties and laboratories which closely relate to national development strategies and public welfare. These are labeled key faculties and key laboratories and supporting funds are intensively provided by the government in order to raise education and research to an international level (Table 7, Table 8).

Table 7: Number of key faculties

	Baseline	Target	Actual	
	2003 Baseline Year	2008	2008	2013 1 Year After Completion
Inner Mongolia University	NL: 2 PML: 8	NL: 3 PML: 10	NL: 3 PML: 26	NL: 3 PML: 26
Inner Mongolia University of Nationalities	NL: 0 PML: 3	NL: 0 PML: 4	NL: 0 PML: 9	NL: 0 PML: 12
Inner Mongolia Normal University	NL: 0 PML: 8	NL: 0 PML: 10	NL: 0 PML: 18	NL: 0 PML: 18
Inner Mongolia University of Technology	NL: 0 PML: 5	NL: 0 PML: 7	NL: 0 PML: 9	NL: 0 PML: 9
Inner Mongolia Agricultural University	NL: 1 PML: 8	NL: 2 PML: 9	NL: 1 PML: 22	NL: 1 PML: 22
Inner Mongolia University of Finance and Economy	NL: 0 PML: 0	NL: 0 PML: 7	NL: 0 PML: 7	NL: 0 PML: 7
Inner Mongolia Medical University	NL: 0 PML: 3	NL: 0 PML: 18	NL: 0 PML: 5	NL: 0 PML: 5
Inner Mongolia University of Science and Technology	NL: 0 PML: 0	NL: 2 PML: 10	NL: 0 PML: 7	NL: 0 PML: 10
Baotou Normal College	NL: 0 PML: 0	NL: 0 PML: 0	NL: 0 PML: 0	NL: 0 PML: 0
Baotou Medical College	NL: 0 PML: 1	NL: 0 PML: 0	NL: 0 PML: 7	NL: 0 PML: 9

Source: Answers to the questionnaire
Note: NL (National Level): National key faculty, PML (Provincial or Ministerial Level): Provincial or ministerial key faculty

All of the target universities, except for Inner Mongolia Medical University, could attain the target in both the provincial and ministerial key faculty although Inner Mongolia Agricultural University and the Inner Mongolia University of Science and Technology failed to achieve the target in the designated number in the national key faculty.

For instance, there are a number of cases of good practice related to the Project in Inner Mongolia University. Of the equipment in Inner Mongolia University procured under the Project, equipment in the biological science faculty (20 items, 61 sets) such as a micrograph analysis system, has contributed to an improvement in the education and research level of the National Key Faculty of Zoological Science and the Provincial or Ministerial Key Faculties of Biochemistry and Molecular Biology. In the biological area, research funding for research project “New breeding of genetically modified beef cattle for high production volume” (National Science Technology Special Theme) was obtained in 2011. And in the chemical area, a patent license on “way of blending a kind of super-absorbent polymer” was gained in 2007. In all cases, the equipment procured under the Project is utilized and contributes to research results.

Table 8: Number of key laboratories

	Baseline	Actual	
	2003 Baseline Year	2008	2013 1 Year After Completion
Inner Mongolia University	NL: 0 PML: 6	NL: 0 PML: 17	NL: 0 PML: 31
Inner Mongolia University of Nationalities	NL: 0 PML: 1	NL: 0 PML: 3	NL: 0 PML: 13
Inner Mongolia Normal University	NL: 0 PML: 2	NL: 0 PML: 7	NL: 0 PML: 17
Inner Mongolia University of Technology	NL: 0 PML: 2	NL: 0 PML: 4	NL: 0 PML: 11
Inner Mongolia Agricultural University	NL: 0 PML: 8	NL: 1 PML: 12	NL: 1 PML: 27
Inner Mongolia University of Finance and Economy	NL: 0 PML: 0	NL: 0 PML: 1	NL: 0 PML: 2
Inner Mongolia Medical University	NL: 0 PML: 0	NL: 0 PML: 0	NL: 0 PML: 1
Inner Mongolia University of Science and Technology	NL: 0 PML: 0	NL: 0 PML: 0	NL: 0 PML: 16
Baotou Normal College	NL: 0 PML: 0	NL: 0 PML: 0	NL: 0 PML: 0
Baotou Medical College	NL: 0 PML: 1	NL: 0 PML: 2	NL: 0 PML: 4

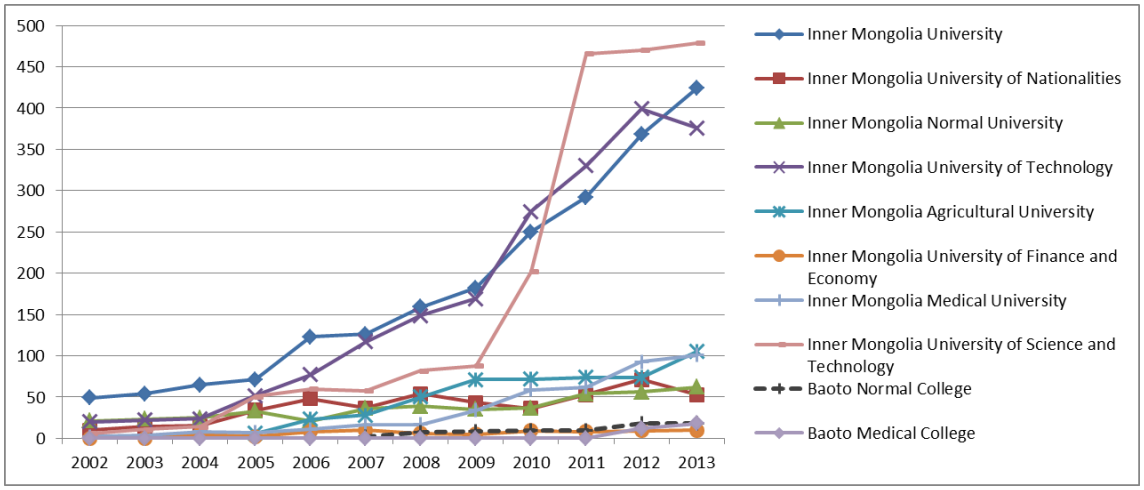
Source: Answers to the questionnaire
Note: NL (National Level): National key faculty, PML (Provincial or Ministerial Level): Provincial or ministerial key faculty

The number of accredited key laboratories increased gradually in many target universities. A number of research results in the key laboratories are related to the Project. In particular, in Inner Mongolia University equipment procured under the Project had a positive effect on the applications for and accreditations of the key laboratories such as the "IMAR key laboratory of coal chemistry (2007)", the "Ministry of Education key laboratory of biotechnology on pasture and unique crops (co-established by the Ministry of Education and the IMAR government in 2007)", the "IMAR key laboratory of semiconductor and solar photovoltaic technology (2009)", the "National Key Laboratory Breeding Base[17] of Mammal reproductive biology and Biotechnology (co-established by the Ministry of Education and the IMAR government in 2009" and the "IMAR Key Laboratory and Key Laboratory Breeding Base of Structural Examination (2009)". Furthermore, to some extent, equipment procured under the Project contributes to research and educational activities at key laboratories which are expected to play an important role in the environmental sector such as the "laboratory on biodiversity protection and sustainable use (IMAR Key Laboratory Breeding Base)" of Inner Mongolia Normal University and the "IMAR Key Laboratory of Bio-production" of Inner Mongolia Agricultural University.

[17] Breeding Base is certified as a laboratory at the preparatory stage for becoming a key laboratory.

(3) Research results such as the number of research papers

The number of research papers published in international scholarly journals listed in such as Science Citation Indicators (SCI) has been basically increasing at the target universities (Figure 2).



Source: Answers to the questionnaire
Note: SCI (Science Citation Indicators), EI (Engineering Index), ISTP (Index to Scientific & Technical Proceedings)

Figure 2: Number of articles in SCI, EI, and ISTP

Although the number was less than fifty at most of the target universities before Project implementation, an increase in articles since 2005 to 2009 has been an outstanding feature. More high-quality research papers have been written thanks to facilities being expanded by the Project and larger research budgets being allocated than before project implementation. An example of research papers listed in SCI (science citation index) database includes “The enhancement effect of phosphor molybdic acid (H3PMo12O40) on Pd/C catalyst for the electro reduction of hydrogen peroxide” (the Inner Mongolia University of Nationalities) and so forth. Equipment procured under the Project is also used for papers. As mentioned before, the Project has had a positive effect on the expansion of facilities and therefore it can be said that the Project has contributed to the increase in research papers to some extent.

As far as direct effect is concerned, the educational environment has improved gradually as floorage and the monetary value of educational equipment per student has been enhanced. The development of school buildings and experimental equipment has contributed to improving the educational environment to some extent. In addition, the Project has an effect on the increase of the designation of key faculties and laboratories. Also, many research papers have used equipment procured under the Project. Therefore, the Project has played a role in improving the quality of education and research.

3.3.2 Qualitative Effect

(1) Effects of building construction and equipment procurement

Effects of building construction and equipment procurement include 1) good results on the "Undergraduate University Teaching Level Evaluation" and 2) improvement of undergraduates' practical skills.

In the "Undergraduate University Teaching Level Evaluation", as mentioned before, the improvement of the experiment execution rate by the enhancement of floorage and monetary value per student was appreciated and all the target universities were highly regarded as "Excellent Schools". In the Inner Mongolia University of Science and Technology, students' practical skills have improved since the university's equipment was enhanced by the Project. In 2013, students were awarded the second prize in the "National Undergraduates Engineering Training General Skills Contest" in which engineering undergraduates compete on their technical capacities.

An outstanding example of the improvement of the quality of education and research as an effect of building construction and equipment procurement is that students of Inner Mongolia Normal University have received a patent. This was a case where students conducted experiments by themselves, under their professor's instruction, using electrical and electron experimental equipment procured under the Project. There are other example of patents gained by teaching staff in Inner Mongolia University and the Inner Mongolia University of Technology using equipment procured under the Project.

(2) Effects of training

There are some examples of improvement in teaching methods as an effect of training in Japan. Many professors who participated in training in specialized fields realized the effects of seminar-type classes that they had never experienced before and these professors adopted it in their own class after they returned. Especially in Japanese language education, some had the opinion that the communication abilities of students were improved by utilizing the teaching methods that the lecturers learned in Japan; e.g. not one-way lectures but interactive classes etc..

The Inner Mongolia Medical University let teaching staff participate in short-term training for learning the utilization methods of equipment in order to sufficiently utilize large-scale facilities procured under the Project. The returning participants provide training to their students on campus and then the students themselves became able to conduct experiments using the equipment[18]. Moreover, similar short-term training in Japan has been conducted continuously since the completion of the Project using the university's own funds and the results are shared among teaching staff and students on campus. By this, it is expected that

[18] In china, sophisticated equipment is usually operated by technicians.

there will be further enlightenment of teaching staff and improvement of students' experimental skills.

Box 2: Results of beneficiary survey – Participants in training in Japan -

At the same time as the questionnaire survey for the beneficiaries of the school buildings and equipment developed under the Project, a questionnaire survey for participants in training in Japan was conducted. The questionnaire was distributed and the answers were collected in the same way as the questionnaire survey for the beneficiaries of the school buildings and equipment (Box 1). The respondents were 84 in total (male: 50, female: 31, and unknown: 3).

The survey results show that many respondents think that the training in Japan met their needs in most cases and that they had expanded their understanding of Japan. On the other hand, there was the opinion that they could not conduct substantial research in such a short training period. Therefore, they could only learn research and educational methods. However, many participants shared their experience or results of training with others in their universities. There are also some cases where collaborative research has been continuously conducted with universities in Japan, too.

1. Reasons for participating in training in Japan (multiple answers allowed)

	Head-count	%
Recommendation or designation from IMAR Education Department	26	24
Recommendation or designation from University superior	45	41
Own request	34	31
Others	4	4
Total	109	100

2. Preparations before training

To take a Japanese course for three months, and/ or to make a training (research) plan.

3. Selection methods of host institutions

In many cases, the participants were recommended or introduced by other teaching staff that had studied in the institution and already returned to China. Others had participated in the Seminar for Administrators through the Education Department. The main methods are as follows:

- Recommendations (faculty, academic supervisor, acquaintance, family)
- Introduction from other teaching staff that had studied at the host institution and already returned to China
- Networks based on existing relationships between participant's university and the university in Japan
- Participation in the Seminar for Administrators through the Education Department
- Direct contact through the internet.

4. Did your host institution and the training contents meet your needs?

Accordance with needs for host institution and the training contents

	Head-count	%
Meet my needs very well	45	55
Roughly meet my needs	35	43
No opinion	2	2
Does not meet my needs very much	0	0
Does not meet my needs at all	0	0
Do not know	0	0
Total	82	100

In most cases, the host institution and the training courses met participants' needs. However, participants often feel that they could not conduct substantial research due to the short training period and that they could only learn research and educational methods. Some participants could only collect information and data for their research during the training period.

However, many participants share their experience or training results with others in their universities. There are some cases where participants keep in touch with their research supervisors in Japan. And there are also some cases where collaborative research has been continuously conducted with universities in Japan.

Regarding the utilization of training results after returning to China, some have the opinion that it is difficult for them to utilize the knowledge gained at the Seminar for Administrators because their circumstances are largely different from those in Japanese universities. On the other hand, some opinions on good practices at their university were heard. For example, individualized instruction systems such as counseling and personality assessment which are conducted in Japanese universities have been introduced as a support system for the employment of students.

5. Do you think that you expanded your understanding of Japan after your training in Japan?

Expansion of participants' understanding of Japan

	Head-count	%
Expanded very much	38	47
Slightly expanded	40	49
No change	2	2
No opinion	1	1
Others	0	0
Total	81	99

Note: Percentage total is not 100% due to rounding error.

Most of the participants answered that they expanded their understanding of Japan. The reasons for the answers of "no change" or "no opinion" have not been verified because the respondents did not write the reasons.

6. What do you think about deepening exchanges with Japanese universities after completing your training in Japan?

Opinions on deepening exchanges with Japanese universities

	Head-count	%
As we can learn a lot, it is necessary to deepen exchanges with Japanese universities.	55	64
It is preferable to have exchanges with Japanese universities for deepening mutual understanding.	29	34
There is no need to have exchange.	2	2
Others	0	0
Total	86	100

Note: Since some respondents chosen multiple answers, the figure in total exceeded the number of respondents (84).

The number of respondents who do not need to have exchange with Japanese universities remained at 2%. Most of the respondents think that it is better to have exchanges.

7. Beneficiaries' opinion on the Project

Beneficiaries generally have positive opinions. Typical opinions are as follows:

- It is no wonder that this project has great significance. Many people who visited and experienced Japan have revised their view on Japan. It has a larger influence on the next generation through education when researchers and lecturers in universities have such experiences.
- The Project is good. But the training period should be longer in order to achieve the training purposes even if a smaller number people are dispatched.
- As the Project is good, it is better that returning participants enhance this project and continuously promote further academic exchanges and the development of science technologies for both countries.

3.4 Impact

3.4.1 Intended Impacts

Outstanding research projects and social services for Market Economy Reform Support, Environmental Conservation, and Regional Vitalization, and cases of mutual understanding or collaboration between Japan and China are evaluated as impacts. There were many research projects and social services related to the Project reported from each target university other than those mentioned in this section.

(1) Research Projects

In Inner Mongolia Agricultural University, “Research on Advanced Production Technology of Fiberboard from Bushes Growing in Good Sandy Soil (2010–2013)” was conducted. This research project aimed to prevent desertification, to rehabilitate ecology and to improve the income of local habitants who work in fiberboard production. Teaching staff who participated in training under the Project are engaged on this research project and equipment procured under the Project is also used. This research project supported IMAR’s development of economy and society by suggesting new materials and technologies for fiberboard production and by providing the necessary staff training.

In the Inner Mongolia University of Science and Technology, the IMAR Science Research Project, “Research on Rational Development of Mineral Resources and Ecosystem Conservation in the Bayan Obo Deposit (2014–2016)”, is under implementation. This research project is conducted by teaching staff who participated in training on the environment in Japan. The teaching staff have guided students and implement research projects on the development and utilization of natural resources. Measures on the general use of mineral resources and environmental conservation in the Bayan Obo Deposit are taken in this research project.

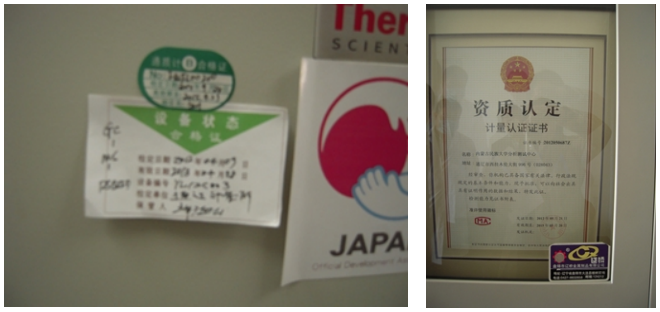
Furthermore, two research projects funded by the National Science Foundation, “Research and Design of Residences in the Settlement of Nomads in the Inner Mongolia Steppe (2009–2010)” and “ Research and Design of Residences in the Settlement of Nomads for Environmental Conservation in the Inner Mongolia Steppe (2012-2014)”, were conducted. The former promoted the improvement of the domiciliary environment of nomads and conservation of the ecological system in the steppe. The latter helped to utilize the steppe resources, to conserve ecological systems and improve the living conditions of local residents.

Many of the research projects, in which equipment procured under the Project is utilized or teaching staff who participated in the training under the Project are active, are in the fields of regional vitalization and environmental conservation. The research projects not only produce research results at the target universities, but they widely contribute to society in ways such as the development of economy and society in IMAR and the improvement of

living conditions of local residents.

(2) Social Services[19]

The Project has contributed in the field of social services. There are good practices of social services in the Inner Mongolia University of Nationalities and Baotou Normal College where there is assay for the melamine level mixed into desiccated milk at the request of the dairy industry by using equipment procured under the Project (high-performance liquid chromatography) in reaction to a Melamine-contamination event[20] in 2008. The Center for Analysis and Measurement of the Inner Mongolia University of Nationalities[21] is accredited by the Quality Supervision Administration of Tongliao, where the Inner Mongolia University of Nationalities is located, and has a good track record of social services such as the inspection and analysis of food and fertilizers at the request of companies, using equipment procured under the Project.



Center for Analysis and Measurement,
Inner Mongolia University of Nationalities
Certified Seal (left) and Certification (right)

(3) Mutual understanding and collaboration between Japan and China

There are some cases of the conclusion of academic cooperation agreements and collaborative research with Japanese universities.

Inner Mongolia University, mainly School of Life Science, has had an exchange, including lectures and symposiums, with Okayama University since 2006. After some teaching staff of Inner Mongolia University underwent training in Okayama University under the Project, a faculty-level exchange agreement between Okayama University, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences and Inner Mongolia University, School of Life Science was concluded in July 2010. Since then, student exchange has been conducted continuously. This developed into an inter-university exchange agreement in January 2012.

As far as collaborative research is concerned, eleven of eighty four respondents of the

[19] One of the so-called “university’s three missions” (education, research and social service). The definition of social services is in accordance with the Higher Education Law in China (passed by the 4th meeting of the 9th Standing Committee of the National People's Congress, on August 29, 1998).

[20] It became known that a toxic substance, melamine, had been mixed into desiccated milk produced and sold by the Sanlu Group located in Shijiazhuang, Hebei Province (bankrupted after the event). Damage spread throughout China. Abnormality of the urinary system such as hepato-calculous was revealed in 296 thousand infants, of which six died.

[21] One-third of the equipment procured under the project was installed in the Center for Analysis and Measurement of the Inner Mongolia University of Nationalities.

beneficiary survey (Box 2) answered that they had conducted collaborative research with Japanese institutions as their host institutions. Although most of the trainees participated in short-term training, there are a considerable number of cases of collaborative research.

The cases of collaborative research have the following in common:

1) The trainee's research theme is the same as that of the professor or research team in the host institution;
2) Collaborative research offers mutual benefits;
3) There is no problem with academic communication in Japanese or English; and
4) It is possible to share or analyze data jointly.

For example, the following cases are examples of the above. A researcher in Japan has a research theme on China and a researcher in China has a research theme on Japan, or researchers both in Japan and in China feel there are mutual benefits in sharing referable research methods. In addition, researchers in a Japanese university and trainees from China can communicate in English, Japanese or Chinese for research.

On the other hand, despite the above features, occasionally collaborative researches cannot be conducted due to various reasons such as no research budget.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

The Environmental Impact Assessment (hereinafter referred to as "EIA") was conducted prior to project implementation in accordance with Chinese regulations. Implementation of "Three-Stage Simultaneous" (i.e. the regulation that environmental protection facilities should be designed, constructed and put into production simultaneously with the main construction structures) was envisioned. Based on this regulation, noise-abatement measures such as consideration of construction hours and particulate measures by using anti-particulate sheets were conducted by each university during the implementation period.

At the time of the ex-post evaluation, no negative impact on the environment was observed, according to responses by the universities to the questionnaire, to interviews with the those in charge, and by visual confirmation at the sites by the evaluator.

After project completion, there have been few emissions that have had an impact on the environment at most of target universities. Flue gas and sewage from experiments in some of the universities are released after treatment based on the instructions of the Department of Environmental Conservation. Therefore, there is no negative environmental impact.

(2) Land Acquisition and Resettlement

The Project was carried out on existing university properties, and thus there was no land acquisition or relocation of residents.

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The hard assets such as buildings constructed and equipment procured under the Project are managed by each target university. Although the department name and operation and maintenance (herein after referred to as "O&M") framework are slightly different depending on the university, generally, in the case of equipment, a chief administrator for O&M is assigned in each laboratory where the equipment is used and each laboratory operates and maintains equipment daily. Daily O&M is managed comprehensively by the State-owned Assets Supervision and Administration Office in each university, which administrates and supervises based on O&M rules decided by each university. These rules of each university are in accordance with the State-owned Assets Supervision and Administration Provision. The IMAR Education Department is in a position to supervise O&M activities in each university.

Since the repayment period for the Project is long as 30 years (or 40 years for the training component), the IMAR Education Department compiled the "Inner Mongolia Autonomous Region Japanese ODA Loan Human Recourse Development Project Reference Book" as written material to be used in the case of taking over before full payment. This was based on the idea of the former chief of the Finance Bureau of Education Department. This reference book covers the whole process of the Project from request, appraisal, government permits and approvals, implementation, tender, settlement and application for funds. It also and includes guidelines on Japanese ODA loans, basic references such as implementation manuals, and the sub-loan agreements with each target university. This reference book is also a collection of lists of school buildings constructed and all the educational equipment procured under the Project and pictures of the school buildings and the major educational equipment have been shared with each university and research institution and are available to the public. The Education Department distributed eight reference books per target university. The reference books are maintained in related departments and are referred to as necessary.

3.5.2 Technical Aspects of Operation and Maintenance

Each university periodically conducts a routine maintenance check. O&M manuals are prepared for equipment. Posters including the user policies and operation procedures are put on the walls near equipment and utilized effectively.

Repair staff trained on the O&M of each type of equipment are allocated to each university department and these staff regularly conduct a routine maintenance check. Although the detailed O&M institutional frameworks are different depending on universities,

in the case of malfunctions that cannot be fixed by these staff, reports are made to a laboratory and facility service center and repair is outsourced following a review of the report. In particular, precision apparatus is not repaired within the university but the university asks manufacturers to perform maintenance for it. Although the detailed O&M institutional frameworks are different depending on universities, the external evaluator was assured that daily maintenance at each laboratory is conducted without any problems.

3.5.3 Financial Aspects of Operation and Maintenance

The necessary O&M costs at the target universities are allocated by each university. The O&M costs accounting for the total expenditures are not large. Therefore the O&M costs do not have a large impact on universities' balance of payments. Rehabilitations of school buildings and replacement of equipment are taken in turn including those for buildings and equipment other than those developed under the Project. It is not expected that extensive repair works are conducted at one time. Also, there is no evidence that equipment lies neglected without maintenance and therefore, it is thought that the necessary resources for O&M are being provided.

Table 9: Income and expenditure at each target university (annual)

Unit: thousand RMB

	2011	**2012**	**2013**
Inner Mongolia University	Income:1,025,892.1 Expenditure:1,068,074.1 (O&M:1,971.5)	Income:731,780.9 Expenditure:606,934.2 (O&M:1,192.0)	Income:820,694.2 Expenditure:874,860.6 (O&M:5,657.6)
Inner Mongolia University of Nationalities	Income:435,420.0 Expenditure:407,540.0 (O&M:1,500.0)	Income:626,710.0 Expenditure:508,240.0 (O&M:1,580.0)	Income:462,790.0 Expenditure:607,950.0 (O&M:1,570,0)
Inner Mongolia Normal University	Income:761,852.0 Expenditure:718,818.0 (O&M:24,381.0)	Income:903,955.0 Expenditure:732,332.0 (O&M:37,388.0)	Income:929,152.0 Expenditure:936,262.0 (O&M:23,309.0)
Inner Mongolia University of Technology	Income:787,306.2 Expenditure:809,429.9 (O&M:19,225.0)	Income:713,167.6 Expenditure:569,152.6 (O&M:37,190.8)	Income:709,110.7 Expenditure:778,831.5 (O&M:37,363.2)
Inner Mongolia Agricultural University	Income:743,688.4 Expenditure:608,372.6 (O&M:1,055.5)	Income:874,252.8 Expenditure:889,898.7 (O&M:1,609.9)	Income:891,723.3 Expenditure:902,689.3 (O&M:1,996.2)
Inner Mongolia University of Finance and Economy	Income:483,738.3 Expenditure:494,739.2 (O&M:33,421.4)	Income:536,059.2 Expenditure:557,918.6 (O&M:11,896.8)	Income:502,364.0 Expenditure:496,073.8 (O&M:11,644.8)
Inner Mongolia Medical University	Income:745,592.7 Expenditure:740,697.8 (O&M:5,460.0)	Income:489,376.3 Expenditure:440,076.5 (O&M:6,285.0)	Income:431,773.3 Expenditure:536,914.4 (O&M:6,757.0)
Inner Mongolia University of Science and Technology	Income:564,750.3 Expenditure:550,154.1 (O&M:8,232.5)	Income:566,615.1 Expenditure:530,735.1 (O&M:19,881.6)	Income:650,242.1 Expenditure:653,108.9 (O&M:28,681.4)
Baotou Normal College	Income:227,320.0 Expenditure:173,180.0 (O&M:200.0)	Income:288,820.0 Expenditure:240,280.0 (O&M:170.0)	Income:233,670.0 Expenditure:293,040.0 (O&M:230.0)

	2011	2012	2013
Baotou Medical College	Income:212,490.0 Expenditure:190,500.0 (O&M:45.0)	Income:220,320.0 Expenditure:268,690.0 (O&M:201.0)	Income:165,030.0 Expenditure:146,830.0 (O&M:230.0)

Source: Answers to the questionnaire
Note: Expenses exceed income in some years and in some universities. However, the shortages are covered by balance brought forward. Each university does not necessarily run a loss which needs to be compensated by the Education Department.

3.5.4 Current Status of Operation and Maintenance

At all the target universities, the buildings and equipment developed under the Project are well maintained. All the universities have inventory books and maintenance logs for major equipment and keep them.

Some of the equipment procured at the beginning of the Project implementation stage, such as scanners and PCs for industrial use, has already reached its end-of-life and was waiting to be scrapped at the time of the ex-post evaluation[22]. Although some other equipment had already been repaired, it is in good operation at the time of the ex-post evaluation.

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

The objective of the Project was to improve higher education in IMAR quantitatively and qualitatively by supporting the construction of buildings, the procurement of equipment and the training of teachers in the target universities. This objective was consistent with China's development plans and development needs at the time of both the appraisal in 2004 and the ex-post evaluation as well as with Japan's ODA policy at the time of the appraisal; therefore its relevance is high. Although the outputs were essentially completed in line with the initial plans, both the project cost and project period exceeded the plan. Therefore, efficiency of the Project is fair. The effectiveness and impact of the Project was high because the direct effects of the Project (building areas and monetary value of educational equipment) and the indirect effects of the Project (number of key faculties and laboratories, number of research papers, etc.) have improved. Moreover, there are many cases of good practice in the utilization of buildings, equipment and training supported by the Project. No major problems have been observed in any of the institutional, technical and financial aspects of the operation and maintenance system and its current status is very good; therefore the sustainability of the project effects is high.

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

[22] New equipment has been already installed instead of this equipment.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

[Establishment of system needed when records are taken over during implementation]

In IMAR, detail information on Project implementation is available in the “Inner Mongolia Autonomous Region Japanese ODA Loan Human Recourse Development Project Reference Book”, written material provided in the case of taking over before full payment, which includes all of the official documents, equipment lists, trainees’ numbers and pictures. When it is necessary to clarify something related to the Project at the time of the ex-post evaluation or on other occasions during the repayment period, even if there is no staff who know the Project, somebody can deal with the issues by referring to the book. In the case of projects where nothing visible or tangible is left and where information has been scattered and lost as time has passed after the project completion, such as a project for the procurement of equipment of which the durable life period is less than 30 years, or a human development project composed of training or studying abroad, a reference book that shows everything is useful for the executing agency and JICA as it facilitates project supervisions.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	8 target universities	10 target universities
1) school buildings	6 universities 11 buildings such as libraries 192,531 m^2	7 universities 7 buildings such as libraries 166,644 m^2
2) equipment	7 target universities Equipment of Center for Analysis and Measurement, electric engineering etc.	9 target universities As planned
3) training	153 staff from 8 target universities	187 staff from 10 target universities
2. Project Period	March, 2005 – March, 2010 (61 months)	March, 2005 – June, 2012 (87 months)
3. Project Cost		
Amount paid in foreign currency	5,073 million yen	5,072 million yen
Amount paid in local currency	3,237 million yen (243.4 million RMB)	3,955 million yen (320.2 million RMB)
Total	8,309 million yen	9,028 million yen
Japanese ODA loan portion	5,073 million yen	5,072 million yen
Exchange rate	1 RMB = 13.3 yen (As of September 2004)	1 RMB = 12.35 yen (average between April, 2005 and July, 2012 [23])

[23] Average exchange rate for the duration of actual disbursements