Ex-Post Project Evaluation 2014: Package II-2
(Kazakhustan, China, Malaysia, Pakistan)

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Republic of Kazakhstan

Ex-Post Evaluation of Japanese ODA Loan

"Astana Water Supply and Sewerage Project"

External Evaluator: Nobuyuki Kobayashi, OPMAC Corporation

0. Summary

The objective of this project was to ensure a wider coverage of water supply and sewage services and to improve the quality of the water supply through the development of water supply and sewerage infrastructures in Astana City which has seen a remarkable increase in its population. As the project objective is consistent with the priorities of the development policy (both at the time of the project appraisal and the ex-post evaluation) and given the increase in demand for water supply and sewerage service, the relevancy of this project is high. The efficiency of the project is low. The project cost was substantially exceeded mainly because a construction boom caused an inrease in construction and labour costs in Astana. In addition, the project period was prolonged due to a delay in both procurement and civil works. In terms of water supply service, the volume of water supply and the water leakage rate achieved their target. Water supply volume per capita has decreased due to the diffusion of water flow meters as well as better awareness of water saving, both of which were brought about by this project. In terms of sewage service, although the quality has not been improved as much as projected, due to the population growth, the quality of discharged water satisfies both the discharge standard based on domestic regulations in Kazakhstan and the standard activated-sludge method in Japan. Approximately 70% of beneficiaries did not experience a suspension of water supply and sewerage services, and approximately 20-30% replied that the suspension of these services was not frequent. From this point of view, the effectiveness and impact of this project is considered high. As for the sustainability of the project, given the tariff level at the time of the ex-post valuation, it will be difficult to recover the investment costs and secure capital costs for any major repairs that become necessary. In terms of the current status of operation and maintenance, no definite plan on the final disposal of sludge from the sewerage treatment plant has yet to be worked out. Therefore, sustainability of the project effects is fair.

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

1. Project Description

Project Location

Water Intake Facility Constructed by the Project

1.1 Background

In December 1997 the Republic of Kazakhstan moved the capital from Almaty in the southeast part of the country to Astana City, which is located in the middle part of Kazakhstan. At the time of the capital's transfer, it was expected that the population would expand from 280,000 people to approximately 500,000 by 2010. Despite this population growth forecast, rehabilitation and renovation had not been undertaken since the facilities were installed at the time of the former Soviet Union. It was anticipated, therefore, that Astana City's existing water supply and sewage facilities would have difficulty in providing stable and qualitative public service in the future.

With regard to the water supply facilities, in addition to insufficient treatment capacity at one of the water treatment plants, aging water intake pumps at the Vyacheslavsky Reservoir and water leakage from old distribution pipes had reduced the water supply capacity. Moreover, because water flow meters were not installed on every house the water tariff was set at a fixed rate. This resulted in wasteful water usage since the principle of users responsibility did not work. With regards to the sewer facilities, equipment in the sewage treatment plant was remarkably obsolete and in pressing need of rehabilitation. Replacement of the old sewer pipes was also delayed and the pumps frequently broke down.

In response to the request from the government of Kazakhstan in regards to the development of the new capital, in 2001, JICA conducted the urban design model study for the development of the City of Astana and simultaneously conducted a feasibility study on the development of water supply and sewerage system. Based on this feasibility study, the project implemented the construction of a water treatment plant, the installation of water flow meters, the rehabilitation of the sewage treatment plant, and the replacement and installation of water distribution and sewer pipes.

1.2 Project Outline

The objective of this project is to reduce the leakage rate, control water supply per capita, and improve water quality by the rehabilitation and improvement of Astana City's water supply and sewerage systems, including installation of water flow meters, and thereby contributing to a wider coverage and better quality of water supply and sewerage services.

Loan Approved Amount/ Disbursed Amount	21,361 million yen / 21,253 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2002 / July 2003
Terms and Conditions	Interest Rate 2.2% (Consulting Service: 0.75%) Repayment Period 30 years (Consulting Service: 40 years) (Grace Period 10 years) Conditions for Procurement: General untied (Bilateral tide for consultants)
Borrower / Executing Agency	Government of the Republic of Kazakhstan / Astana City
Final Disbursement Date	January 2013
Main Contractor (Over 1 billion yen)	Ebara Corporation (Japan) / Alsim Alarko San. Tes. ve Tic. A.S. (Turkey)
Main Consultant (Over 100 million yen)	JV Nihon Suido Consultants Co., Ltd (Japan) / NJS Consultants Co., Ltd (Japan) / Consult Co., Ltd (Kazakhstan)
Feasibility Studies, etc.	"The urban design model study for the development of the City of Astana (F/S on Water Supply and Sewerage in the City of Astana)", JICA, 2001 / "Special Assistance for Project Implementation for Astana Water Supply and Sewerage Project" JBIC, 2005
Related Projects	Development Study "The detailed design study of the water supply and sewerage system for Astana City" 2002-2003

2. Outline of the Evaluation Study

2.1 External Evaluator

Nobuyuki Kobayashi, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: August 2014 – October 2015

Duration of the Field Study: October 11, 2014 – October 24, 2014

February 21, 2015 – February 27, 2015

2.3 Constraints during the Evaluation Study

The project's sustainability rating is based on indirect evidence such as salary payments and staff member hiring trends because financial information could not be obtained from Astana Su Arnasy (ASA), which is the government agency responsible for the project's operation and maintenance.

3. Results of the Evaluation (Overall Rating: C[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of Kazakhstan

The national development plan at the time of the appraisal entitled "the Strategy for the Development of the Republic of Kazakhstan until the Year 2010" (2001), emphasized the improvement of the water supply service for maintaining people's health conditions as a part of the strategy of health care sector. Improving water quality and ensuring sufficient drinking water volumes were targeted as the main objectives of water resource management. In addition, at the time of the appraisal, the "Master Plan for the Development of the City of Astana" had been formulated and the development of water supply and sewerage infrastructure was included in a part of the mid-term plan until the year 2010. In this plan, the greatest importance was attached to (1) the installation of reliable water supply and sewerage facilities, and (2) the decrease in water leakage and wasteful water usage for the efficient use of water resources.

"The Strategy for Development of the Republic of Kazakhstan until the year 2020" (2010), which was the national development plan at the time of the ex-post evaluation, requires relevant government agencies to bear the responsibility for providing public services (water, electricity, gas, and heat) in accordance with regularory standards. Policy goals also include the, decrease of distribution loss for water, electricity, gas, and heat and the improvement in user satisfaction with each service. Moreover, in the "Regional Development Program to the

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

[2] ③: High, ②: Fair, ①: Low

Year 2020", the construction and rehabilitation of 212 km of distribution pipes and 128 km of sewer pipes are projected during the planned period between 2015 and 2019. This program has targeted 100 percent of the provision of water supply and sewage services by 2019.

From the time of the appraisal through the time of the ex-post evaluation, the national development plan's priority areas have been expanded from ensuring adequate quality of drinking water to the effective use of water resources. During this period, the greatest importance has been attached to the development of Astana City's water supply and sewerage infrastructures. This project regards the development of water supply and sewerage infrastructure as its outputs and also includes a countermeasure against water leakage and efficient water usage as a part of the project outcomes. Thus, the project objectives are consistent with priority areas of the policies both at the time of the appraisal and the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Kazakhstan

The population of Astana City was 300,000 people in 1999, and at the time of appraisal, the population was forecasted to reach 490,000 people by 2010 [3]. Given such a substantial increase in population was expected, it was obvious that the capacity of water supply and sewage treatment would become insufficient. Astana City's, water resource is surface water and the water supply system had been established in the 1960's. The feasibility study of this project ("The urban design model study for the development of the City of Astana (F/S on Water Supply and Sewerage in the City of Astana)", JICA, 2001), anticipated that pumps of the water intake facility could not be operated by 2010 and that the existing water treatment plant would also not be operable by 2020. It was also pointed out that water leakage from distribution pipes was salient. Moreover, excessive use of water was an issue to be solved. As water flow meters were not equipped, it was difficult to measure the volume of water usage. At the time of the appraisal, water supply surpassed 400 liters/capita/day in Astana city. As the amount was larger than those in other cities, wasteful usage of water needed to be corrected[4]. In addition, the capacity of the sewage treatment plant, which was completed in the 1970's, had been lowered because of aging facilities and insufficient maintenance work.

In July 2014, the population of Astana City reached approximately 840,000 people. The rapid increase was not expected at the time of the appraisal. The City of Astana has become the second most populous city in the country after Almaty City. In order to accommodate the

[3] The population of Astana City reached approximately 700,000 people in 2010. This population was far larger than the forecast at the time of the appraisal.

[4] At the time of the appraisal, the amounts of water supply/capita/day were in 341 liters in London, 229 liters in Paris, and 206 liters in Singapore.

pronounced population growth, the water supply and sewerage system infrastructures have continued to be developed. The old water treatment plant, which was in operation before the project implementation, has been rehabilitated and a new sewer treatment plant (118,000 m^3/day) has been under construction.

At the time of the appraisal and the ex-post evaluation, it was concluded that there is strong demand for the facilities rehabilitated or enhanced by the project. Given a steep rise of population, it is ovious that there is strong demand for water supply and sewage services.

3.1.3 Relevance to Japan's ODA Policy

At the time of the appraisal, Country Assistance Program for the Republic of Kazakhstan had not been prepared. However, policy dialog on economic cooperation between Kazakhstan and Japan had been conducted, and great importance was attached to the development of economic and social infrastructures in the development assistance to Kazakhstan. In "Japan's ODA White Paper 2003" issued by Ministry of Foreign Affairs of Japan, a priority for development assistance to the Central Asian Region was placed on "development of economic and social infrastructures that is a foundation of self-supporting economic and social development". In the "ODA Data Book by Country 2002" issued by the Ministry of Foreign Affairs of Japan, infrastructure development was also mentioned as one of the priority areas for devlopment assistance to the Republic of Kazakhstan because "aging of economic and social infrastructures" was regarded as a development issue of the country.

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

3.2 Efficiency (Rating: ①)

3.2.1 Project Outputs

The project implemented construction and rehabilitation works for the water intake facility, a water treatment plant, and a sewage treatment plant (see Figure 1). Major differences between the initial plan and actual outputs are shorter lengths of transmission pipes, distribution pipes, and sewer pipes, decrease in the number of installation of water flow meters, and change of some specifications of the sewage treatment plant (see Table 1). As for the water treatment facilities of the plant, the scope of the project was maintained mostly as planned. As the cancelled parts of the project scope were handled by Astana Su Arnasy (ASA) with the government budget, it does not affect the incidence of the project effects. The number of installation of water flow meters was reduced because users have begun to install the meters on their own since the water rates based on a measured rate system was cheaper than the rates based on a flat rate system.

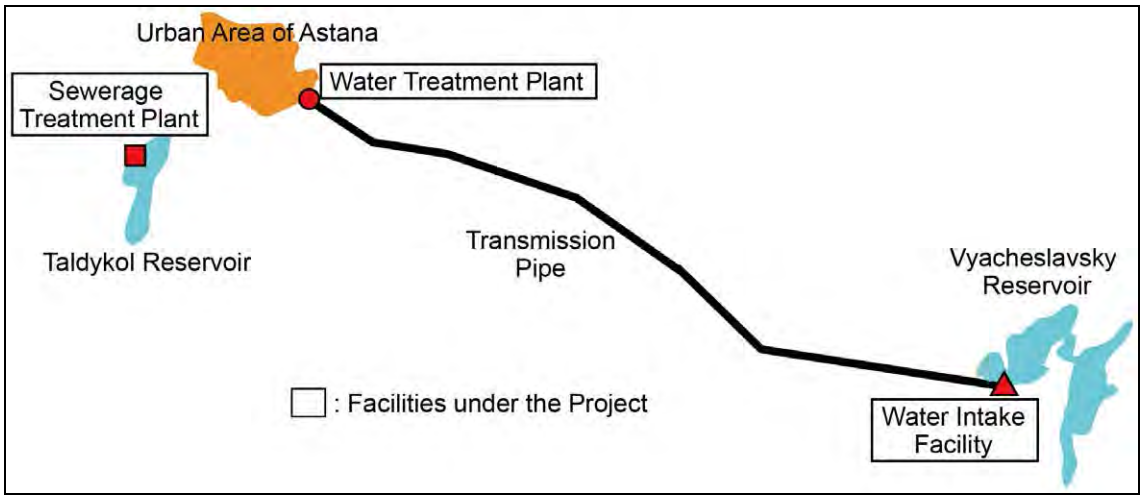


Figure 1: Project Site

Table 1: Project Outputs

Plan	Actual
Civil Works: • Construction of water intake facility (5 pumps) • Construction of a water treatment plant (capacity of water purification 100,000m^2/day) • Renewal (approx.99km) and new installation in the new city (15km) of distribution pipes • Installation of water flow meters (153,900) • Rehabilitation of sewage treatment plant • Renewal of sewer pipes (approx.21km, 44 pumps) • Introducing of sewage treatment machinery	Civil Works: • Construction of water intake facility (6 pumps) • Construction of a water treatment plant (capacity of water purification 105,000m^2/day) • Renewal (approx.98km) and new installation in the new city (approx.6km) of distribution pipes • Installation of water flow meters (85,333) • Rehabilitation of sewage treatment plant (repair works with concrete of aeration tank is out of the scope of the project) • Renewal of sewer pipes (approx.15km, 54 pumps) • Introducing of sewage treatment machinery (changed the construction of digester to rehabilitation)
Consulting Service: Overseas 207M/M Domestic 558M/M	Consulting Service: Overseas 442M/M Domestic 1,623M/M

Source: documents provided by JICA, the executing agency

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost is significantly higher than planned (194% of planned costs). The actual project cost was 55,329 million yen whereas the planned project cost was 28,481 million yen. During the period from the time of cost estimation for the project (January 2002) to the commencement of the construction (November 2006), both materials costs (steel materials, PVC pipes) and labour costs had steeply risen due to a construction boom in Astana City. The price escalation was the main cause of the increase in the project cost. During the project implementation, the project cost was amended in accordance with a price adjustment clause in the civil works contract.

3.2.2.2 Project Period

Project period is significantly longer than planned (184% longer than planned). The actual project period was 103 months whereas the planned period was 56 months (see Table 2). The commencement of consulting service was delayed by five months from the original plan and the commencement of civil works was delayed by 26 months. The major causes for taking a longer period to conclude a civil works contract were a delay in the preparation of tender documents, and prolonged contract negotiation due to the increase in the project cost. The actual period of civil works was 63 months compared to the planned period of 42 months. Major causes for a delay in civil works were: (1) civil works were sometimes halted due to the lack of budget in the executing agency, and (2) the sewage treatment plant needed to be rehabilitated at the site where existing facilities were installed and handing over of the site was often delayed.

Table 2: Project Period

	Planned Period	**Actual Period**
L/A Signing	July 2003	July 2003
Consulting of Construction Supervision	December 2003 - February 2008	May 2004 - January 2012
Civil works	September 2004 - February 2008	November 2006 – January 2012
Project Completion (Project Period)	February 2008 (56 months)	January 2012 (103 months)

Source: documents provided by JICA

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

With regard to calculating the Financial Internal Rate of Return (FIRR), the actual data of FIRR was 0.2% whereas the planned FIRR was 2.6% (see Table 3 for preconditions for the calculation). FIRR fell short of the planned rate mainly due to an increase in the construction cost and a delay of revising the water rates. When calculating FIRR at the time of the appraisal, the water rate for households was estimated to double the tariff level in real terms and the rate of industrial water to become four times higher. However, the actual rate has not reached these levels. In terms of calculating the project's Economic Internal Rate of Return (EIRR), the actual data of EIRR was 16.0% whereas the planned EIRR was 15.7%. The actual EIRR was almost equal to the planned EIRR because the increase in construction costs was offset by an increase in demand for water supply. At the time of the appraisal, it was anticipated that after 2020, 40% of household water supply demand would be purchased from other sources and avoiding this cost was considered a benefit of the project.

Table 3: Calculating Conditions of Internal Rate of Return

	FIRR	EIRR
Costs	Construction cost, O&M cost	Construction Cost, O&M cost
Benefits	Water Rate Revenue	Decreases of investment and O&M cost for existing facilities, reduction of water purchasing cost, that of labor of drawing water, and that of sewage treatment cost
Project Period	40 years after the completion	40 years after the completion
Preconditions	• O&M cost in the presumption at the appraisal reflected an increase in project cost. • Used actual data for water rate revenue and construction cost. • Demands for water supply and sewage service were on the presumption of 0.56% growth per year during the project period (in accordance with "UN Population Prospect 2012 revision") • The rates for both water supply and sewage services are estimated double from the current level by the year 2024. • Calculated in real terms.	• O&M cost was on the same presumption as FIRR. • Used presumptions at the appraisal for the items which sufficient data was not available (decreases in investment in existing facilities and O&M cost, decrease in labour of drawing water, decrease in sewage treatment cost). • As for the decrease in water purchasing cost, only the volume was updated and other presumption at the appraisal for benefit unit were used. • The conversion factor was 0.8 times. • Demand forecast was on the same presumption as FIRR. • Calculated in real terms.

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

3.3 Effectiveness[5] (Rating: ③)

On an intervention theory of this project, it was expected that the project outputs, such as the development of water supply and sewage facilities and the installation of water flow meters, would bring about outcomes, such as an increase in the volume of water supply, a decrease in the volume of water usage per person, and the betterment of water quality. It was assumed that those outcomes would ultimately contribute to the incidence of impacts, such as accommodating a growing population and the betterment of the quality of the service.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) Water Supply Service

The volume of water supply two years after the project completion was higher than the target (see Table 4). It was forecasted that the capacity of water supply in the old water treatment plant would decrease to 82,000 m^3/day in 2010. Therefore it would have been difficult to ensure the current volume of water supply without this project, and it should be noted that this project played a significant role in increasing the volume of water supply. Also, the volume of water supply per person has decreased and achieved the target. Water flow meters were not widely installed at the time of appraisal. A water tariff incorporating a

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

user-pays principle was adopted after the installation of water flow meters and, as a result, wasteful water usage has been curbed. The water leakage rate has achieved the target and has continued to decrease in the period for which data was available (after 2009). As shown above, the incidence of the project effects is obvious in water supply service.

Photo 1: Inside of Water Treatment Plant

Photo 2: Control Room of Water Treatment Plant

Table 4: Operational and Effect Indicators for Water Supply Service

	Baseline	Target	Actual		
	1999 F/S Implementation	2000 2 Years After Completion	2012 Completion Year	2013 1 Year After Completion	2014 2 Years After Completion
Volume of Water Supply (m^3/day)	131,000	144,000	165,923	164,641	179,156
Volume of Water Supply by Person (litres/person/day)	436	294	214	208	215
Rate of Water Leak (%)	26.0%	20.0%	19.0%	19.9%	NA

Source: documents provided by JICA and ASA
Notes: the amount of water supply is the total supply amount from the existing plant (not assisted by yen loan) and newly installed plant (assisted by yen loan)

(2) Sewage Service

The amount of sewage surpassed the capacity of the sewage treatment plat (136,000 m^3/day) due to an unexpectedly high population growth. For this reason, the BOD5 of the outlet waste water from the sewage treatment plant has not achieved its target (6.0mg/litre) (see Table 5). The BOD5 of the outlet waste water is below the concentration level permitted for the plant (10.65mg/litre) in accordance with Kazakhstan regulations. Given the sewage treatment plant rehabilitated by the project uses activated-sludge method, its BOD5 of the waste water is within a permissible level in accordance with the standard in Japan (BOD5 of outlet waste water is 10-15mg/litre for standard activated-sludge method) and the EU standard (BOD5 of outlet waste water is below 25mg/litre for a sewage treatment plant in

urban area)[6]. Although the target has not been achieved, the BOD5 of outlet waste water is below the concentration level permitted for the plant, which is stipulated in Kazakhstan regulations, and within a permissible level in accordance with the standards of other countries. It is concluded, therefore, that sewage service has a middle level of effect by the project.

Table 5: Operational and Effect Indicators for Sewage Service

	Baseline	Target	Actual		
	1999 F/S Implementation	2000 2 Years After Completion	2012 Completion Year	2013 1 Year After Completion	2014 2 Years After Completion
Volume of Sewage Treatment (m^3/day)	NA	NA	149,822	168,701	161,572
BOD5 of outlet waste water (mg /litre) of Sewage Treatment Plant	8.3	6.0	8.4	9.5	8.7

Source: documents provided by JICA and ASA
Notes: Although the volume of sewage treatment was not set as an operational and effect indicator at the appraisal, it is stated as it is important for evaluation.

3.3.2 Qualitative Effects (Other Effects)

(1) Diffusion of Water Flow Meters and Better Awareness of Water Saving

Between 2000 and 2014, water flow meter coverage has increased from 9% to 76%. This project provided approximately 20% of the installed meters during this period. ASA continuously conducts campaigns for the installation of water flow meters. In tandem with an increase in the coverage of water flow meters, since August 2010, ASA has introduced a two-stage progressive rate system based on the volume of water usage. In this ex-post evaluation, a questionnaire survey was implemented in the Sary Arka District in Astana City. The residents and entrepreneurs who installed water flow meters in assistance with the project were interviewed (the number of valid responses was 181)[7].

[6] It is difficult for biological treatment (such as activated-sludge method) to achieve the target for BOD5 of outlet waste water. Value judgement reflected this difficulty and is based on an appropriate target for the same type of waste water treatment method.

[7] The Sary Arka District was chosen because this project installed the largest number of flow meters in the district.

Table 6: Better Awareness of Water Saving in the Sary Arka District

		Yes, very much	Yes, to some extent	No, not much	Not at all	Total
Do you consider your volume of water usage after the installation of a water meter?	Number of responds	98	40	31	12	181
	%	54.1%	22.1%	17.1%	6.6%	100.0%
Do you think a water meter makes you conserve energy?	Number of responds	75	47	42	17	181
	%	41.4%	26.0%	23.2%	9.4%	100.0%
Do you think that a water meter makes you save payment for water?	Number of responds	66	48	43	24	181
	%	36.5%	26.5%	23.8%	13.3%	100.0%

Source: Beneficiary Survey

The study showed that, after water flow meters were installed, approximately 80% of respondents (total of "Yes, very much" and "Yes, to some extent") have become conscious of the volume of water usage, approximately 70% (total of "Yes, very much" and "Yes, to some extent") have saved water usage, and 60% (total of "Yes, very much" and "Yes, to some extent") have saved the water rate (see Table 6). The project has contributed to a wider coverage of water flow meters and the introduction of a water rate system that put the brakes on wasteful water usage, and has brought about an increase in the awareness of saving water in the target area.

(2) Introduction of Advanced Monitoring Flow Meter

In many cases, individual users read a water flow meter and declare the volume of water usage by themselves. Occasionally users intentionally declare a low usage amount which prevents an appropriate charge for water usage. In addition, in some cases involving individual flow meters, meters have been artificially manipulated to reduce payment for water. The project installed 3,500 advanced monitoring flow meters on a trial basis in addition to the usual water flow meters (80,325 meters for individual users, 1,508 bulk flow meters). Since the advanced monitoring flow meter automatically sends volume usage data, ASA is able to accurately measure water usage. For the introduction of the advanced monitoring flow meters, the project provided training to five ASA staff in charge, and one of them had training out of the country. The small number of staff (five employees) could precisely measure water usage in 3,500 locations with the installation of the advanced flow meters. Since there are few places where advanced monitoring flow meters are introduced in the country, the project provided some advanced assistance for determining an appropriate water usage charge.

3.4 Impacts

3.4.1 Intended Impacts

(1) Increase in Population for Water Supply

In 2014 the population of Astana City was approximately 840,000 people. The increased volume of water supply between and "before" and "after" the project implementation was 48,156m^3, which is equivalent to the volume of water supply for 224,000 people (approximately 30% of the total population) based on the volume of water supply per person in 2014 (215 litres/person/day). This project has played an indispensable role in providing water supply service in the City which has seen its population grow rapidly.

(2) Stability of Water Supply and Sewage Services and Residents' Satisfaction

In the aforementioned survey of the beneficiaries, people were asked their opinions about the stability of water supply and sewage services. At the time of the ex-post evaluation, approximately 70% of respondents answered that there was no suspension of water supply and sewage services and approximately 20-30% replied that the suspension was not frequent (see Table 7). With regard to suspension of water supply service, approximately 50% of respondents answered "No change" compared to 5 years ago, and the total answers of "Less frequent" and "Much less frequent" exceeded 40%. Additionally in regards to the suspension of sewage service, more than 50% of respondents answered "No change" compared to 5 years ago, and total answers of "Less frequent" and "Much less frequent" slightly exceeded 40% (see Table 8)[8]. While the number of respondents who replied that the stability of the services worsened is relatively small, the result generally suggests an improvement of service stability after the project implementation.

Table 7: Stability of Water Supply and Sewage Services in the Sary Arka District

		Very frequent	Frequent	Not frequent	Never	Total
Suspension of Water Supply Service	Number of responds	1	9	52	119	181
	%	0.6%	5.0%	28.7%	65.7%	100.0%
Suspension of Sewage Service	Number of responds	7	10	40	124	181
	%	3.9%	5.5%	22.1%	68.5%	100.0%

Source: Beneficiary Survey

[8] In Astana City, more than half of the residents have resettled in the last 10 years. It was difficult to obtain sufficient samples for the questions to compare "after" with "before" the project implementation. Thus, the study assessed the quality of water supply and sewage service in comparison with 5 years ago, taking into consideration of the January 2012 project completion date.

Table 8: Stability of Water Supply and Sewage Service in the Sary Arka District Compared to 5 Years Ago

		Much more frequent	More frequent	No change	Less frequent	Much less frequent	Total
Suspension of Water Supply Service	Number of responds	1	9	92	50	29	181
	%	0.6%	5.0%	50.8%	27.6%	16.0%	100.0%
Suspension of Sewage Service	Number of responds	2	5	99	54	21	181
	%	1.1%	2.8%	54.7%	29.8%	11.6%	100.0%

Source: Beneficiary Survey

In this questionnaire survey, the users were also asked about the degree of satisfaction of water supply and sewage services and installation of water flow meters. In response to the betterment of services, the total of "Very satisfied" and "Satisfied" exceeds 80% of all responses (see Table 9).

Table 9: Satisfaction of Water Supply and Sewage Services and Installment of Water Meters in the Sary Arka District

		Very satisfied	Satisfied	Unsatisfied	Very unsatisfied	Total
Water Supply Service	Number of responds	71	89	12	9	181
	%	39.2%	49.2%	6.6%	5.0%	100.0%
Sewage Service	Number of responds	48	96	27	10	181
	%	26.5%	53.0%	14.9%	5.5%	100.0%
Installation of a water meter	Number of responds	62	85	30	4	181
	%	34.3%	47.0%	16.6%	2.2%	100.0%

Source: Beneficiary Survey

(3) Water Quality of Tardykol Reservoir

The sewage treatment plant rehabilitated by this project discharges the treated water into the Taldykol Reservoir. BOD5 of outlet waste water of the Reservoir has increased from 6.0mg/litre in 1999 to 9.0mg/litre in 2014. The quality of water has become worse as the capacity of sewage treatment is not sufficient due to the growing population. However, the pooled water in the Reservoir has not been used, so that deterioration of water quality does not affect water usage.

At the time of ex-post evaluation, a new sewage treatment plant and a waterway was under construction to accommodate a rise in the water level of Taldykol Reservoir, and it is planned that the treated water will be discharged directly into the Ishim River after evaporation of the Reservoir in 2017. At the time of ex-post evaluation, ASA has monitored

the water level of Taldykol Reservoir since drainage into the Reservoir has continued.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

A water treatment plant, a sewage treatment plant, and a pump station had been constructed at the sites owned by ASA, and transmission pipes, distribution pipes, and sewer pipes have been buried under the ground. As civil works have been implemented at the sites where existing facilities were installed and the instalation of new pipes is replacememt of exisiting pipes in most of the sections, it is concluded that civil works' impacts on natural environment are insignificant. When civil works start, explanatory meetings had been held and the residents were informed of the contact address to file complaints in meetings and through radio broadcasts and residents meeting. On the other hand, dried sludge has been stored in the sewage treatment plant, and thus, an odor issue still remains and needs to be tackled.

As shown in "3.3.1 (2) Sewage Service", the BOD5 of outlet waste water is below the concentration level permitted for the plant in accordance with Kazakhstan regulations.

(2) Land Acquisition and Resettlement

As mentioned above, since civil works have been implemented at the sites where existing facilities were installed, both land acquisition and resettlement of residents did not occur at the time of the project implementation.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

On the operation and maintenance of this project, Astana City was in charge of project implementation, and the ASA has been in charge of the operation and maintenance since project completion. ASA is a public enterprise fully funded by the City of Astana, and important managerial decisions (such as, the investment plan, the number of staff members, and setting salaries) are under the supervision of Astana City. The Agency for the Regulation of Natural Monopolies approves the water tariff. Both at the appraisal and the ex-post evaluation, A Deputy General Manager directly responsible for the management of water supply and sewage facilities has been assigned and has supervised the operation and maintenance of the facilities constructed by the project.

In 2014, the number of ASA staff was 1,536 persons (81 managrial and adminstrarive staff, 280 engineers, and others are operational staff) and the number has increased since the

time of appraisal (902 persons in 2001). The increase of staff members is due to the capacity expansion of water supply and sewage system to cope with the population growth.

The responsibility for operation and maintenance of the facilities constructed by the project was apparent, and the personnel required for the operation of the facilities was ensured. Thus, no problem which could impair the sustainability of the project was found.

3.5.2 Technical Aspects of Operation and Maintenance

On the employment of ASA engineers, it is a prerequisite that they have a degree in the relevant field or operating experience of a similar plant. For instance, an engineer in charge of SCADA has a degree in telecommunications and also has an experience of SCADA operation at a plant using steam. Engineers participate in seminars in relevant fields, and employees posted to the plant have EHS training, i.e. environment, health, and safety. Training for the machine operation is mainly implemented through OJT at a work place.

Manuals for machineries procured by the project and training materials were prepared in Russian and a three-month-training by the contractor was set at the water treatment plant and at the sewage treatment plant. In an interview with the contractor, it was pointed out that a three-month training period was not a sufficient period to change the attitudes of the operational staff. Whereas ASA staff has the sufficient operational experience and the technical knowledge required for the daily operation of water supply and sewage facilities, they are reluctant to change their old operating procedures even after the installation of new machnary.

Since the training period was not long enough to affect ASA staff's attitude in regards to appropriate operation, ASA staff tend not to change existing procedures. Nevertheless, ASA staff members possessed the basic operational ability for water supply and sewage facilities, and when employing engineers, technical knowledge and operating ability is taken into consideration. Therefore, no issue which could impair the project sustainability was found in the technical aspects of operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of ex-post evaluation, ASA is financially self-sustainable without a subsidy from Astana City for operation and maintenance. For both water supply and sewage systems, the tariff revenue can be directly allocated to operation and maintenance. In the tariff adjustment process, ASA has to file an application of water tariff to the Agency for Regulation of Natural Monopolies and to obtain an approval on a new tariff. When filing an application, a 5-year investment plan is submitted together with the application.

Regarding ASA's sales of water supply and sewerage services for the last five years, an increase in revenue has exceeded the consumer price index (see Table 10). According to the ASA, despite an increase in the number of the employees, there has been no delay of salary

payments. Also, malfunctioning facilities have been fixed or replaced at the plants. Although data on expenditure items for operation and maintenance was not available, it is assumed that expenses required for routine operation and maintenance are ensured taking into consideration the timely salary payment and proper repairs to facilities.

Table 10: Sales of ASA in Water Supply and Sewage Services

	2009	2010	2011	2012	2013
Sales (Tenge)	1,504,482,981	2,019,317,020	3,148,965,050	4,665,042,349	5,483,380,760
Rate of increase compared to the previous year	-	34.2%	55.9%	48.1%	17.5%
CPI(2010=100)	79.9	100.0	127.2	131.7	131.3
Rate of increase compared to the previous year	-	25.2%	27.2%	3.5%	-0.3%

Source: ASA

Since 2010, a water tariff reform has progressed in Astana City. On the water supply service, the same rate was applied to all users before 2010, but differant rates have been applied to individual users, government organizations/state-owned enterprises, and private corporations since 2010 (see Table 11). Moreover, a progressive rate system has been introduced for individual users since 2011, in which the rates are classified into three categories water usage volume, i.e. "Below 3 m^3/month", "Above 3 m^3/month", and "No meter".

Table 11: Trend of the Water Rates

Unit: Tenge/m^3

Service	Classification	5/2004-6/2006	10/2009-8/2010	9/2010-8/2011	9/2011-8/2012	9/2012-8/2013	9/2013-4/2015
Water Supply	Individual Users (below 3m^3/month)	20.14	22.59	22.59	27.11	31.17	35.85
	Individual Users (above 3m^3/month)				32.53	37.41	43.02
	Individual Users (no meter)				39.04	46.84	53.78
	Government organizations/ State-owned enterprises			35.71	62.49	93.74	97.49
	Private corporation			56.48	90.00	111.95	112.59
Sewage Treatment	Individual Users	14.48	16.35	16.35	18.80	21.62	24.87
	Government organizations/ State-owned enterprises			35.2	84.48	92.93	102.22
	Private corporation			40.9	89.14	101.24	107.80

Source: ASA

The rate in May 2004 was 20.14 Tenge/m^3 for water supply service and 14.48 Tenge/m^3 for sewage treatment service. In September 2013, the rate for water supply service was 35.85 Tenge/m^3 (178% compared to 2004) for individual users of "Below 3 m^3/month", 43.02 Tenge/m^3 (214% compared to 2004) for individual users of "Above 3 m^3/month", 112.59 Tenge/m^3 (559% compared to 2004) for private corporations, and the rate of sewage treatment service was 24.87 Tenge/m^3 (172% compared to 2004) for individual users and 107.8 Tenge/m^3 (774% compared to 2004) for corporate users. The inflation rate during that period was approximately 200% and the rate of water supply and sewage treatment services for individual users remained at a similar level in real terms. Although water tariff reform has been underway, it can be assumed that the current tariff has not recovered the investment cost.

While the current water tariff covers daily operational costs, it does not seem to be enough to handle a major repair and reinvestment. It is concluded, therefore, that there is a minor problem in the financial aspects of operation and maintenance.

3.5.4 Current Status of Operation and Maintenance

With regard to spare parts, the timing of inspections is scheduled and the inspections are implemented based on a record of operation time. Repair and replacement are also carried out based on its necessity. During the project implementation, the lists of spare parts and inter-changeable equipment produced by other companies were made. From hearings with ASA staff members, there seems to be no spare part that is difficult to be obtained. Poor functioning was observed for some installed facilities at the time of the ex-post evaluation. The major malfunctions reported by ASA are as follows:

- Distribution Pipes Valves: It was reported that there were problems in the valves made in Thailand due to a breakdown of gears. ASA has already replaced these valves with Russian-made valves.
- Grit Separator: The facility has been clogged often due to unremoved garbage. The grit separator currently has not been used but ASA has coped with this problem by using the grit channel which has been used before the rehabilitation. ASA staff find garbage in the grit channel by visual inspection and dispose of it.
- Walls of the Building: Some walls were encroached as ice clogged the gutter and rainwater could not be drained. ASA has repaired the walls and the roofs.
- Digester: The digester needs to obtain heat from a boiler when it decreases the quantity of sludge and makes it safe. The digester malfunctioned at the time of the ex-post evaluation, and it has not been used. The sludge was being stored in the sewage treatment plant at the time of the ex-post evaluation. The storage capacity will

reach its limit in the medium- and long-term since there was no plan for the final disposal of the sludge.

- SCADA: In the water treatment plant, the monitoring function of a sand filter has ceased. In the sewage treatment plant, since a meter for polymers at the sludge treatment plant has not been monitored by SCADA, ASA has directly checked the meter and a manual operation has been on-going.

It is concluded that there are minor problems in operation and maintenance. The digester was not used, and the storage capacity will reach its limit in the medium- and long-term. However, there is no definite plan to cope with this issue.

Some minor problems have been observed in terms of the financial aspects and the current status of operation and maintenance. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to ensure a wider coverage of water supply and sewage services and to improve the quality of the water supply through the development of water supply and sewerage infrastructures in Astana City which has seen a remarkable increase in its population. As the project objective is consistent with the priorities of the development policy (both at the time of the project appraisal and the ex-post evaluation) and given the increase in demand for water supply and sewerage service, the relevancy of this project is high. The efficiency of the project is low. The project cost was substantially exceeded mainly because a construction boom caused an increase in construction and labour costs in Astana. In addition, the project period was prolonged due to a delay in both procurement and civil works. In terms of water supply service, the volume of water supply and the water leakage rate achieved their target. Water supply volume per capita has decreased due to the diffusion of water flow meters as well as better awareness of water saving, both of which were brought about by this project. In terms of sewage service, although the quality has not been improved as much as projected, due to the population growth, the quality of discharged water satisfies both the discharge standard based on domestic regulations in Kazakhstan and the standard activated-sludge method in Japan. Approximately 70% of beneficiaries did not experience a suspension of water supply and sewerage services, and approximately 20-30% replied that the suspension of these services was not frequent. From this point of view, the effectiveness and impact of this project is considered high. As for the sustainability of the project, given the tariff level at the time of the ex-post valuation, it will be difficult to recover the investment costs and secure capital costs for any major repairs that become necessary. In terms of the current status of operation and maintenance, no definite plan on the final disposal of sludge from the sewerage treatment plant has yet to be

worked out. Therefore, sustainability of the project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

ASA stored dried sludge in the sewerage treatment plant. This shows that a countermeasure for odor needs to be enhanced and that the final disposal of the sludge will face a storage capacity limitation in the sewage treatment plant in the medium- and long-term. It is desirable for ASA to formulate an environmentally-sustainable program to cope with dried sludge at the earliest opportunity.

4.2.2 Recommendations to JICA

It is desirable for JICA to monitor two or three times a year, the disposal of dried sludge, encourage ASA to take appropriate actions, and continuously provide technological advice to the government of Astana City, if needed.

4.3 Lessons Learned

Public Awareness Campaign in Grey Water

The population growth was much greater than initially forecasted. The unexpected population growth resulted in an increase of grey water and, eventually, an excessive load on the sewage treatment plant. For this reason, the target for the improvement of water quality was not achieved. It was infeasible to flexibly change the capacity of the sewage treatment along with the increase in population. Nevertheless, a reduction of pollutants with the cooperation of the residents was an option worth considering. For examples, these options are to stop discharging waste oil into a sewage system and to use biodegradable detergents. It is worth assessing a campaign to reduce grey water as a contingency plan for an unexpected population growth in a project that rehabilitated and constructed a sewage treatment plant.

Longer Training Period

This project set a three-month training period for using the new equipment. Although the operators obtained sufficient knowledge of the machineries in the water treatment plant and the sewage treatment plant, they continued with their existing operating procedures. It takes time to understand the benefits of new technologies fully and to practice new procedures whenever that new technology involves a radical change in operational procedures. In such cases, it is desirable to carefully plan a project period to accommodate at least one year training period.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	Civil Works: • Construction of water intake facility (5 pumps) • Renewal of transmission pipes (approx.15km) • Construction of a water treatment plant (capacity of water purification 100,000m^2/day) • Renewal (approx.99km)and new installation in the new city (15km) of distribution pipes • Installation of water flow meters (153,900) • Rehabilitation of sewage treatment plant • Renewal of sewer pipes (approx.21km, 44 pumps) • Introducing of sewage treatment machinery(Sludge belt- thickener, replacement of sludge pumps) Consulting Service: Overseas 207M/M Domestic 558M/M	Civil Works: • Construction of water intake facility (6 pumps) • Construction of a water treatment plant(capacity of water purification 105,000m^2/day) • Renewal (approx.98km) and new installation in the new city (approx.6km) of distribution pipes • Installation of water flow meters (85,333) • Rehabilitation of sewage treatment plant (repair works with concrete of aeration tank is out of the scope of the project) • Renewal of sewer pipes (approx.15km, 54 pumps) • Introducing of sewage treatment machinery (changed the construction of digester to rehabilitation) Consulting Service: Overseas 442M/M Domestic 1,623M/M
2. Project Period	July 2003 – February 2008 (56 months)	July 2003 – January 2012 (103 months)
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 19,109 million yen 9,372 million yen (10,530 million KZT) 28,481 million yen 21,361 million yen 1KZT = 0.89 yen (As of January 2002)	 23,432 million yen 31,897 million yen (39,998 million KZT) 55,329 million yen 21,253 million yen 1KZT = 0.80 yen (Average between January 2003 and December 2011)

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

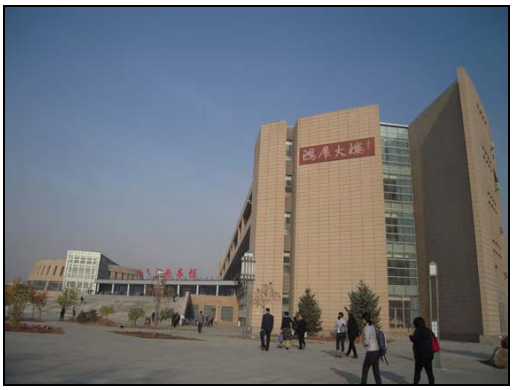
0. Summary

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)

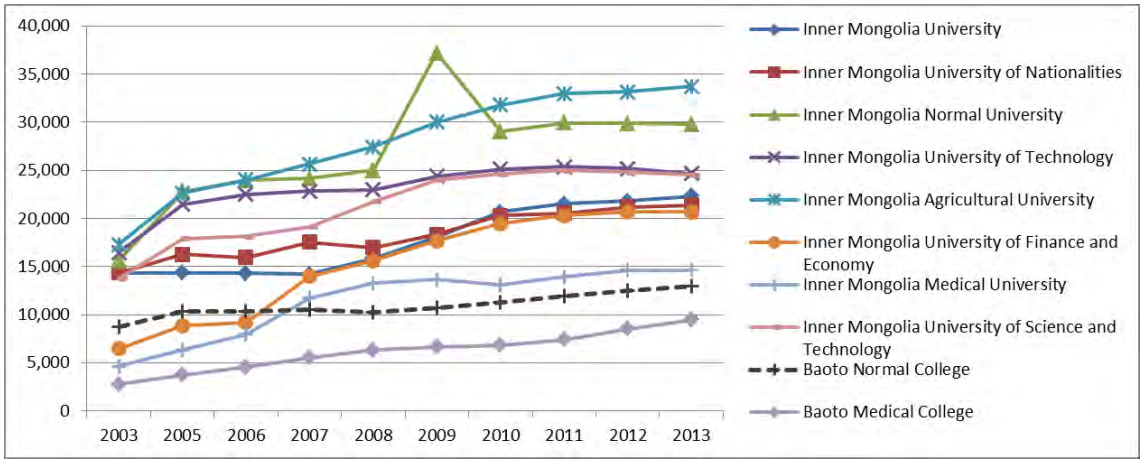
3.3.1.1 Direct Effects

(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

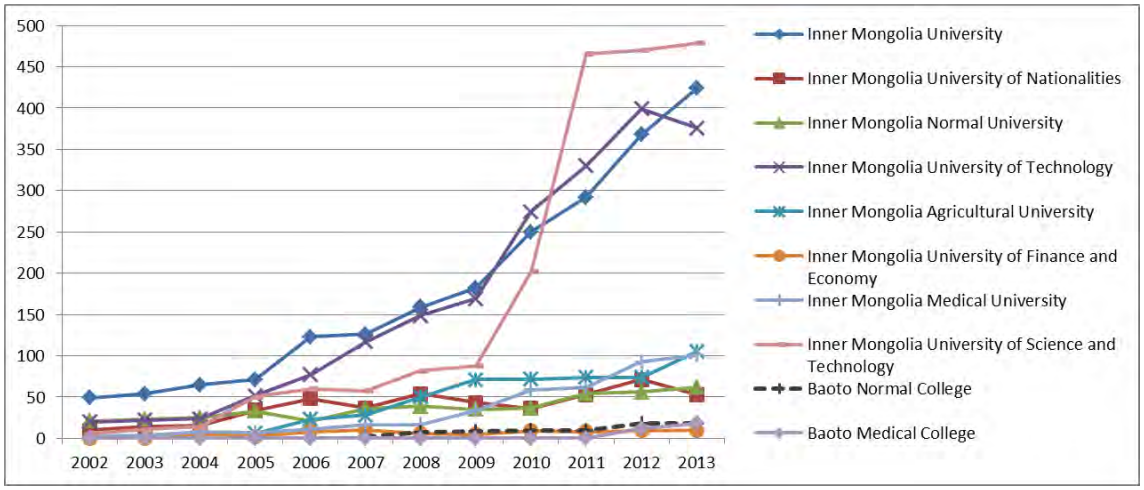
Source: Answers to the questionnaire
Note: NL (National Level): National key faculty, PML (Provincial or Ministerial Level): Provincial or ministerial key faculty

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

Malaysia

Ex-Post Evaluation of Japanese ODA Loan Project

"Higher Education Loan Fund Project (II)"

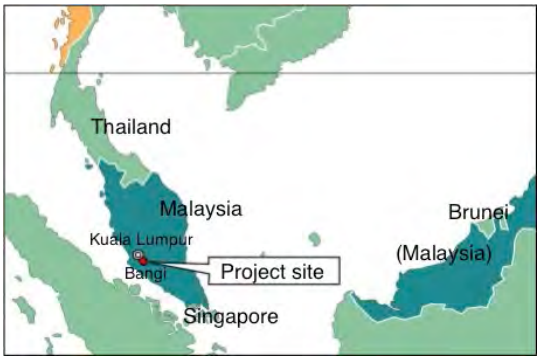
External Evaluator: Takako Haraguchi, International Development Associates, Ltd.

0. Summary

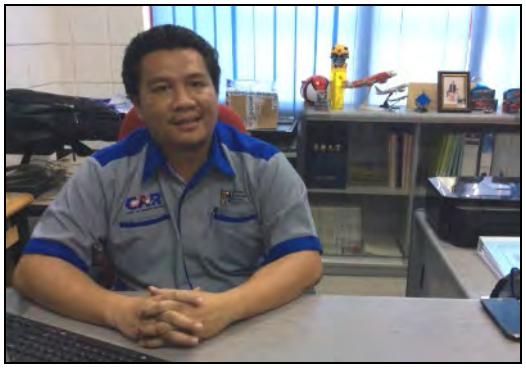
This project is the second phase of a series of projects titled "Higher Education Loan Fund Project (HELP)" that aims at human resource development in science and technology by providing support to Malaysian students for study at universities in Japan. Under this project, a total of 270 undergraduate and 79 graduate students obtained the bachelor's and master's degrees, respectively, in Japan. Relevance of the implementation of this project is high mainly because its objective is consistent with Malaysia's development policies and needs related to (i) promotion of knowledge- and technology-intensive economy through development of high-level human resources and (ii) in doing so, learning from Far East Asia including Japan. Efficiency is evaluated to be fair mainly as the project sent a smaller number of students to Japan than planned, while the project cost was within the plan. Effectiveness and impact are high since most students completed their programs with good grades and are active as engineers, lecturers, etc. using what they had learned in Japan such as work ethics of Japan and knowledge and skills in specialized fields. The undergraduate program of this project is characterized by "twinning," with which part of undergraduate education is provided in Malaysia, and students transfer to universities in Japan in the middle of the program. The introduction of twining made an impact on reduction of cost of study in Japan that had been said to be high as well as improvement of twinning in the next HELP that led to the improved efficiency and effectiveness of study in Japan. As for sustainability, no problem was seen in terms of both follow-ups for graduates produced under this project and continuation of overseas study programs by the executing agency.

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

1. Project Description



Project Location



A graduate who became a lecturer of Faculty of Engineering and Built Environment, National University of Malaysia

1.1 Background

Malaysia had been aiming for establishment of the economy and society based on high technologies (an advanced nation) by the year 2020 according to "The Way Forward (Vision 2020)" announced in 1991. Among others, development of human resources in science and technology including engineers was essential to increase the value added and strengthen competitiveness of the Malaysian industry such as manufacturing. However, the deployed efforts to enhance quantity and quality of domestic education institutions could not fully meet the human resource development needs. In particular, those who wanted to learn advanced knowledge had to study abroad.

On the other hand, Malaysia had promoted the Look East Policy since 1982. The Look East Policy, introduced by the then Prime Minister Mahathir, aimed to build a nation in a unique way by proactively learning from Far East Asian countries such as Japan and Korea. In 1983, Japan had started to provide assistance to support the Look East Policy in such a way as dispatch of teachers for a pre-matriculation program in Malaysia, and since 1984 it had continuously accepted Malaysian students to study in Japanese universities. In 1993, a Japanese ODA Loan project, "Higher Education Loan Fund Project" (preceding phase of this project; hereafter called "HELP1" when it refers to the first phase of HELP[1]) was launched with Yayasan Pelajaran MARA (MARA Education Foundation) (YPM) as the executing agency. Under HELP1, a total of 310 Malaysian students were supported in their study in Japan such as through provision of a pre-matriculation program and scholarships[2]. However, there was an issue that study in Japan was more expensive than study in the United States or European countries. In response to this issue, it was decided to introduce a system called "twinning" under this project (HELP2). With this system, students transfer to Japanese universities in the middle of their undergraduate education instead of entering Japanese universities from the first grade. Malaysia had had experiences of twinning with universities of the United States, the United Kingdom, Australia, etc., and this project was to introduce twinning with Japanese universities as well for continuous support for study-in-Japan programs.

1.2 Project Outline

The objective of this project is to develop qualified engineers by providing support to Malaysian students for their study in undergraduate or postgraduate programs in science and engineering in Japanese universities, thereby contributing to Malaysia's economic development through promotion of science and technology.

[1] The three-phased ODA Loan projects, "Higher Education Loan Fund Project," "Higher Education Loan Fund Project (II)" and "Higher Education Loan Fund Project (III)" are called "HELP1," "HELP2" and "HELP3," respectively. This project is HELP2. In addition, a Malaysian domestic project "Malaysia Japan Higher Education Program (MJHEP)," which is implemented by YPM (without external financial assistance) by means of a twinning system developed under HELP and with Japanese universities that participated in HELP, is sometimes called "HELP4."

[2] HELP1 originally planned to send 240 students to Japan. Out of the 310 students who were actually supported under HELP1, 279 students finally got the degrees.

Loan Approved Amount/ Disbursed Amount	5,285 million yen / 4,984 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	April, 1999 / April, 1999
Terms and Conditions	Interest Rate: 0.75% Repayment Period: 40 years (Grace Period): (10 years) Conditions for Procurement: General Untied
Borrower / Executing Agency	Malaysia / Yayasan Pelajaran MARA (MARA Education Foundation) (YPM)
Final Disbursement Date	June, 2009
Main Contractor (Over 1 billion yen)	None
Main Consultant (Over 100 million yen)	Registered Non-Profit Organization Asia SEED
Feasibility Studies, etc.	"Special Assistance for Project Implementation (SAPI) for Higher Education Loan Fund Project (II)" Japan International Cooperation Agency (JICA), 2001.
Related Projects	・ "Higher Education Loan Fund Project (HELP1)" (Japanese ODA Loan project, 1992-2002) ・ "Higher Education Loan Fund Project (HELP3)" (Japanese ODA Loan project, 2006-2015) ・ Dispatch of experts (teaching staff) (Technical Cooperation, 2000-2003) ・ Cultural Grant Aid to MARA Education Foundation (Grant Aid project, 2001) ・ Dispatch of teaching staff to MARA Education Foundation by the Japan Foundation (1999-2001) ・ "Malaysia Japan Higher Education Program (MJHEP)" (Domestically-funded project of Malaysia, 2011-)

Table 1 outlines the HELP-related projects that have been planned and implemented by the time of this ex-post evaluation.

Table 1: Outlines of HELP1-HELP3 and MJHEP (HELP4)

	HELP1	HELP2 (This project)	HELP3	MJHEP (HELP4)
Scheme (Loan Agreement)	Japanese ODA Loan project (May 1992)	Japanese ODA Loan project (April 1999)	Japanese ODA Loan project (March 2005)	Malaysian domestic project (-)
Executing Agency	YPM	YPM	YPM	YPM
Project Period	1993-2004	1999-2009	2005-2015	2011-2020
Program	Undergraduate - 2 year study in Malaysia (pre-matriculation) - 4 year study in Japan (enrollment to the 1st grade)	Undergraduate - 2 year study in Malaysia (1 year pre-matriculation and 1 year undergraduate education for the 1st grade) - 3 year study in Japan (transfer to the 2nd grade) Master's - 2 year study in Japan	Undergraduate - 3 year study in Malaysia (1 year pre-matriculation and 2 year undergraduate education for the 1st and 2nd grades) - 2 year study in Japan (transfer to the 3rd grade) Master's - 2 year study in Japan Doctor's - 3 year study in Japan	Same as HELP3
Planned number of students by category	Undergraduate: 240	Undergraduate: 400 Master: 140	Undergraduate: 242 Master: 55 Doctor: 25	Undergraduate: 1,500 Master: 240 Doctor: 50

Sources: Prepared based on JICA documents and response from the executing agency.

2. Outline of the Evaluation Study

2.1 External Evaluator

Takako Haraguchi, International Development Associates, Ltd.

2.2 Duration of Evaluation Study

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

Duration of the Field Study: November 5-14, 2014, January 25-30, 2015

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

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of Malaysia

This project is consistent with the development policies at the times of both appraisal and ex-post evaluation. First, regarding general development policies, Vision 2020 and the Look East Policy mentioned in "1.1 Background" are still effective at the time of ex-post evaluation[5]. Also, the Seventh Malaysia Plan (1996-2000) at the time of appraisal and the Tenth Malaysia Plan (2011-2015) at the time of ex-post evaluation both set an objective of contributing to economic development through development of high-level human resources in science and technology.

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

[4] ③: High, ②: Fair, ①: Low

[5] In 2012, the 30th anniversary of the Look East Policy, implementation of the Second Wave of the Look East Policy in the six priority areas including advanced technology was announced (statement of Prime Minister Najib on December 13, 2012).

Second, regarding science and technology promotion policies, the Ministry of Science, Technology and Innovation (MOSTI) places human resource development at the head of the list of nine strategic objectives to achieve Vision 2020 and the Tenth Malaysia Plan[6].

Third, as for higher education development policies, the National Higher Education Strategic Plan (2007-2020) states that economic development requires establishment of a knowledge-based economy and creation of innovation through development of human resources with first-rate intelligence. To achieve this, the plan places priority policies such as promotion of research and innovation, strengthening of higher education institutions and internationalization of universities, and sets the targets such as increasing the number of researchers, scientists and engineers to 100 per 10,000 workforce[7].

3.1.2 Relevance to the Development Needs of Malaysia

Due to the situation described in "1.1 Background," the objective of this project is highly consistent with development needs at the time of appraisal. At the time of ex-post evaluation, it is considered to be mostly consistent with development needs based on the following findings (relevant indicators are shown in Table 2). First, needs for engineers seem to have been filled as the number of registered engineers and research and development (R&D) personnel increased faster than the number of the workforce, and the number of scientists, researchers and engineers per workforce significantly increased. However, a number of documents including the Tenth Malaysia Plan point out, as an issue of the Malaysian labor market, the dependence on unskilled foreign labor that has hindered transition to high value added industry and the consequent drain of high-level human resources abroad. This shows the continuing needs for high-level human resources.

Second, regarding needs for higher education, development of higher education institutions in Malaysia have progressed compared to those at the time of appraisal. However, the development should be continued following the increase in the number of students. The ratio of students in science and technology has remained a little under 40% of students enrolled in higher education. From this, necessity to enhance science and technology education, the target area of this project, is confirmed.

Third, the number of students studying abroad was stagnant (data on the exact number were not available) at the time of appraisal due to the economic crisis in 1997, but it turned to an increasing trend at the latest in the middle of the 2000s. The major designations of Malaysian students for study include Australia, the United States and the United Kingdom, while the number of students studying in Japan only slightly increased. According to persons related to Malaysian students' study in Japan, students have not increased much due to the limited number of institutions that provide pre-matriculation programs for study in Japan. It was also reported that the number of applicants to pre-matriculation programs has been decreasing since 2011 partly due to the Great East Japan

[6] MOSTI website.
[7] "Review of the National Higher Education Strategic Plan" Ministry of Education, 2013.

Earthquake. Nevertheless, YPM, the executing agency of this project, and the Public Service Department of Malaysia that supervises study-in-Japan programs under the Look East Policy emphasized the high needs for learning advanced knowledge and technologies from Japan.

Besides sending students abroad, internationalization of education has progressed in Malaysia such as through establishment of satellite schools of foreign universities and cooperation between Malaysian universities and foreign universities (twinning, credit transfer and double degree[8]). Accordingly, the domestic higher education system has been developed so that students could receive high quality education in Malaysia without having to study abroad. In this way, it can be said that studying in Japan with twinning that this project supported is still significant as one of the diversifying higher education opportunities.

Table 2: Indicators on Supply of Human Resources in Science and Technology and Higher Education

	1998 Year of Appraisal	2002	2006	2010 1 year after project completion	2011	2012	2013	Annual average growth rate
Indicators on supply of human resources in science and technology								
Total workforce (thousand persons) [a]	8,884	9,543	10,276	11,777	12,284	12,723	13,210	3%
Of which, manufacturing (thousand persons) [a]	1,908	2,069	2,083	1,972	2,222	2,228	2,215	1%
Number of newly registered engineers (person) [b]	1,773	N.A.	3,253	5,235	7,266	6,543	7,922	10%
Number of R&D personnel (person) [c]	6,656	10,731	13,416	50,484	57,405	N.A.	N.A.	18%
Number of researchers, scientists and engineers per 10,000 workforce (person) [d]	7.0	18.0	17.9	55.4	58.1	57.5	N.A.	16%
Indicators on higher education								
Number of public higher education institutions (universities) [aef]	11	N.A.	20	20	20	20	20	4%
Number of polytechnics [e]	9	14	18	25	28	30	32	9%
Number of community colleges [e]	0	22	45	76	79	84	86	13%
Number of private higher education institutions [aef]	N.A.	N.A.	515	476	500	437	418	-3%
Gross enrollment ratio to higher education (%) [c]	22.7*	25.74	28.58	37.13	35.97	N.A.	N.A.	4%
Number of students enrolled in higher education (thousand persons) [c]	473*	632	737	1,061	1,036	N.A.	1,156	6%
Ratio of science and technology students (%) [c]	N.A.	40.1	37.8	34.2	34.9	34.8	N.A.	-1%
Number of students studying abroad (person) [c]	N.A.	N.A.	53,924	77,623	89,580	81,282	78,936	6%
Of which, studying in Japan (person) [g]	N.A.	1,885	2,156	2,465	2,417	N.A.	N.A.	3%

Sources: a) Yearbooks of Statistics Malaysia; b) Board of Engineers Malaysia; c) United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute of Statistics; d) Malaysian Science and Technology Information Centre, MOSTI; e) Ministry of Higher Education of Malaysia; f) National Educational Statistics; g) Japan Student Services Organization.
Notes: 1) A polytechnic (professional technical school) and a community college (junior college) are higher education institutions that do not award undergraduate or higher degrees.
2) The data with asterisk "*" in the column of year 1998 are as of 1999.

3.1.3 Relevance to Japan's ODA Policy

This project is consistent with Japan's ODA policy at the time of appraisal. Based on the policy dialogues with the Malaysian side and studies in the economic cooperation mission in March 1993 and policy discussions thereafter, the priority areas of Japan's assistance for Malaysia were set as

[8] Under a double degree program, a student can receive degrees from both the Malaysian universities that s/he belongs to and the cooperating foreign university at one time.

environmental conservation, poverty eradication and regional development, and development of human resources and small and medium enterprises. The priority area "human resource development" includes assistance in higher education and capacity development in high value-added industry, as well as in the Look East Program[9].

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

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The outputs of this project consisted of (1) implementation of an overseas study program for undergraduate degree (provision of scholarships for pre-matriculation education in Malaysia and undergraduate education in Japan, etc.), (2) implementation of an overseas study program for postgraduate (master's) degree (provision of scholarships for post graduate education in Japan, etc.), (3) procurement of equipment for education in Malaysia, (4) dispatch of teaching staff from Japan for education in Malaysia, and (5) consulting services. The total number of students and the number of teaching staff dispatched were smaller than the numbers originally planned at the appraisal, while the other outputs were produced as planned. The number of students decreased as the project revised the planned number downward[10] in 2002 (after the commencement of the project), and aligned the number of students to recruit, educate and send to Japan to the revised plan. It is considered that the decrease in the number of teaching staff was due to the reduction of the number of students and thus reasonable. In this way, the actual outputs were compared to the plan at the appraisal, not the revised plan, in accordance with the principle of ex-post evaluation of Japanese ODA Loan projects.

(1) Overseas study program for undergraduate degree (undergraduate program)

In the undergraduate program, it was planned that students would receive pre-matriculation education for one year and a part of undergraduate education in Malaysia (the Japan Associate Degree Program (JAD Program)), transfer to Japanese universities with credits earned from the JAD Program and recognized by the Japanese universities, receive the rest of undergraduate education required for graduation, and obtain the undergraduate degrees from the Japanese universities. Regarding twinning, the project planned (i) to apply the "2+3" system, in which students would spend two years in Malaysia (pre-matriculation education for one year and undergraduate education for the 1st grade) and transfer to Japanese universities at the 2nd grade for

[9] "*Kunibetsu Enjo Jisseki 1991 nen – 1998 nen no Jisseki* (results of country-specific assistance in 1991-1998)," Ministry of Foreign Affairs of Japan.

[10] In February 2002, the executing agency and JICA agreed to revise the planned number of students to be sent to Japan from 400 persons (plan at appraisal) to "at least 280 persons" for the undergraduate program, and from 140 persons (ditto) to "at least 52 persons" for the postgraduate program. This downward revision was made to cope with the likelihood of increase in cost of education per student following the changes in the situations surrounding the project (also see "3.2.2.1 Project Cost").

three-year education up to graduation, for students of the first two batches out of the total five batches, and then (ii) to shift to the "3+2" system from the third batch, where students would spend three years in Malaysia (pre-matriculation education for one year and undergraduate education for the 1st and 2nd grades) and transfer to Japanese universities at the 3rd grade.

Table 3 shows the actual result: a total of 285 students in five batches were enrolled at the JAD Program, 280 of them (68% of the plan at appraisal) transferred to Japanese universities, and 270 students obtained the degrees and graduated.

Table 3: Plan and Actual Result of the Overseas Study Program for Undergraduate Degree

(Unit: person)

Batch	Education in Malaysia (JAD)				Education in Japan					
	Plan at appraisal (set in 1999)	Revised plan (set in 2002)	No. of entrants (Actual)	No. of completed students (Actual)	No. of students transferred (Actual)	No. of students awarded bachelor's degrees (Actual)				No. of dropouts (Actual)
						Total	In standard time period	After 1-year repeating	After self-funded extension	
1	60	53	53	52	52	51	44	6	1	1
2	60	53	53	49	49	47	43	3	1	2
3	80	69	69	69	69	68	59	4	5	1
4	100	60	60	54	54	50	39	8	3	4
5	100	45	50	56	56	54	42	11	1	2
Total	**400**	**280**	**285**	**280**	**280**	**270**	**227**	**32**	**11**	**10**

Sources: Prepared based on JICA documents and responses from the executing agency.
Notes: Reason for dropouts from the JAD Program (5 persons) was academic performance. Reasons for dropouts from Japanese universities (10 persons) were health (1 person) and academic performance (9 persons, of which 1 students was expelled due to arrears with tuition during self-funded extension period). There was a rule that a student can receive the scholarship for one-year repeating, and all expenses for the stay longer than that must be funded by her/himself.

The venue of the JAD Program was YPM College Bangi (Selangor State), which was same as planned. In Japan, 13 private universities (as planned) and 19 national universities accepted the HELP2 students. In the initial stage of project implementation, the 13 private universities, which had participated in HELP1, formed a consortium[11] and developed the common syllabuses for the 1st grade of undergraduate education and the credit transfer criteria. At later stages, a total of 19 national universities accepted students. Introduction of the "3+2" twinning system was cancelled under this project, and all of the five batches applied the "2+3" system. This was because a JICA study[12] after the project commencement found that the cost saving effect of shifting the system from "2+3" to "3+2" in the middle of the project would not be high.

(2) Overseas study program for postgraduate (master's) degree (postgraduate program)

The postgraduate program provided support to students of the undergraduate program of HELP1 and the Batch 1-3 of this project who wished to continue to study in Japan.

Table 4 shows the actual number of students supported. A total of 79 persons (56% of the plan

[11] The project consultant participated in the consortium, too.
[12] "Special Assistance for Project Implementation (SAPI) for Higher Education Loan Fund Project (II)" Japan International Cooperation Agency (JICA), 2001.

at appraisal) in eight batches enrolled to graduate school, and all of them obtained their master's degrees in two years, the standard period of time. The number of students increased from the revised plan as the remainder of the loan fund after adjustment of fluctuation of unit cost for study was used to support an additional number of students (see "3.2.2.1 Project Cost").

Table 4: Plan and Actual Result of the Overseas Study Program for Postgraduate Degree

(Unit: person)

Batch	Plan at appraisal (set in 1999)	Revised plan (set in 2002)	Number of students enrolled (Actual)			Number of students awarded master's degree (Actual)	
			Total	Obtained bachelor's degrees under HELP1	Obtained bachelor's degrees under HELP2	Total	In standard time period
1	5	3	3	3	0	3	3
2	15	11	11	11	0	11	11
3	20	13	13	13	0	13	13
4	20	15	12	12	0	12	12
5	20	10	13	13	0	13	13
6	20	-	1	1	0	1	1
7	20	-	6	1	5	6	6
8	20	-	20	3	17	20	20
Total	**140**	**52**	**79**	**57**	**22**	**79**	**79**

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

(3) Procurement of equipment

This project planned to procure computers and laboratory equipment for the subjects of mechanical and material engineering, electric, electronic and system engineering and chemical and environment engineering in the JAD Program, and to install them to the computer laboratory and the engineering laboratory. The detailed information on the planned items and quantity was not available, and as for the actual result, a total of 722 pieces of educational and laboratory equipment were procured and installed to the above-mentioned laboratories. In addition to them, 142 pieces of computers and laboratory equipment were procured and installed under the Cultural Grant Aid project (2001).

(4) Dispatch of teaching staff

Lecturers in science and engineering subjects, general education subjects and Japanese language necessary for the JAD Program were selected and dispatched from the universities participating in the consortium (mostly from Takushoku University and Shibaura Institute of Technology). The number of lecturers was determined according to the number of students in each year. The actual work volume of lecturers amounted to 1,332 man-months compared to 1,738 man-months planned at appraisal. This work volume includes that of experts dispatched from JICA and the Japan Foundation (as grant assistance). While information on the planned work volume of those experts under grant assistance was not available[13], the actual volume was 60 man-months

[13] The amount was 199 million yen.

from JICA and 36 man-months from the Japan Foundation.

(5) Consulting services

The scope of work of the consultant was (a) assisting the executing agency in education in Malaysia, (b) discussions and coordination with Japanese universities on twinning, (c) monitoring of students, (d) assisting the concerned parties in taking necessary procedures for education in Japan, and (e) reference to and promotion of internship, which were all implemented as planned. The work volume of consultants was 146 man-months in terms of both plan and actual record.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost was 5,846 million yen (of which the Japanese ODA Loan was 4,984 million yen). Although the project cost was lower than planned, it can be said that the project cost exceeded the plan if taking into consideration of the decrease in the outputs, i.e., downward revision of the planned number of students, with the project cost unchanged[14]. The breakdown of the project cost is shown in Table 5.

Table 5: Planned and Actual Project Costs

(Unit: million yen)

	Plan (appraisal)						Actual					
	Foreign currency		Local currency		Total		Foreign currency		Local currency		Total	
		ODA Loan		ODA Loan		ODA Loan		ODA Loan		ODA Loan		ODA Loan
Undergraduate and graduate programs	3,733	3,733	576	0	4,309	3,733	3,439	3,439	411	0	3,850	3,439
Procurement of equipment	113	113	0	0	113	113	0	0	146	104	146	104
Dispatch of teaching staff	1,108	909	40	0	1,148	909	909	909	29	0	938	909
Administration cost	0	0	50	0	50	0	0	0	323	0	323	0
Consulting services	530	530	40	0	570	530	526	526	58	0	584	526
Total	5,484	5,285	706	0	6,190	5,285	4,874	4,874	966	104	5,840	4,978
Total (including disbursement charges)	5,484	5,285	706	0	6,190	5,285	4,880	4,880	966	104	5,846	4,984

Sources: Prepared based on JICA documents and responses from the executing agency.
Notes: 1) Due to rounding down of the fractions smaller than 1 million yen, the breakdown and total amounts may not match. 2) The actual cost for procurement of equipment includes 41 million yen of the Cultural Grant Aid project. 3) The planned cost for dispatch of teaching staff includes 199 million yen of the grant assistance (dispatch of experts from JICA and the Japan Foundation), but the actual cost corresponding to it was not available. 4) The exchange rates applied were: (planned) 1 ringgit=31.9 yen; (actual) 1 ringgit=30.5 yen.

The downward revision of the planned number of students was made in order to cope with the increase in the unit cost for education in Japan within the limits of the project budget. It is

[14] It was roughly calculated that if the initial estimation of the project cost in 1999 had used the number of students equivalent to the number after the downward revision in 2002, the “planned” cost would have been estimated to be 5,025 million yen, and the actual cost of 5,846 million yen would have been 116% of such a “planned” cost.

reported that such an increase took place mainly due to the following factors: (a) the Malaysian government increased the cost of overseas education per student by 15% (since January 2000); (b) in the undergraduate program, expenditures for scholarships for repeating students were added (the rule was to continue scholarships up to one-year repeating); and (c) in the undergraduate program, expenditures for travel to and stay in Japan for taking exams for transfer admission were added. This project was planned during the period when the Malaysian government was suspending or downscaling overseas education programs following the currency crisis in 1997, and the estimated unit cost was cut to minimum. Therefore, it is considered that the project had little choice but to reduce the number of students in response to the cost rise during the implementation period. In re-estimating the unit cost, the project tried to avoid underestimation by assuming that all students would enroll to private universities in the area where living cost is high. As it turned out that a certain number of students enrolled to national universities and national or private universities in the areas where living cost was lower, the number of students sent to Japan was finally larger than the revised plan.

3.2.2.2 Project Period

The project period was longer than planned (111% of the plan with details shown in Table 6) as some students repeated a year.

Table 6: Planned and Actual Project Periods

	Plan (appraisal)	Actual
Signing on Loan Agreement	April 1999	April 1999
Undergraduate program	March 2008	March 2009
Postgraduate program	March 2008	March 2008
Procurement of equipment	April 2002	November 2002
Project completion (duration)	March 2008 (9 years)	March 2009 (10 years)

Sources: Prepared based on JICA documents and responses from the executing agency.
Note: Project completion was defined as graduation of students in the last batch from undergraduate and postgraduate programs.

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

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

As stated above, although the project cost was within the plan, it did not match the decrease in the outputs. Also, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[15] (Rating: ③)

Most students completed their programs with good grades, and got jobs related to science and technology such as engineers and lecturers. Therefore, it can be said that the graduates obtained high-level knowledge and skills, and became ready to be "qualified engineers" as expected in the project objective. A survey conducted in the ex-post evaluation found that a certain number of graduates were actually developed to be "qualified engineers," and more graduates were either promoted to management or became university lecturers or researchers. It was also found that graduates were satisfied with the overseas education programs of this project.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

Operation and effect indicators were not set at the time of appraisal, nor were the target year for achievement of the project objective. With reference to the operation and effect indicators mentioned in the ex-post evaluation of HELP1 and the ex-ante evaluation of HELP3, this ex-post evaluation used the five indicators shown in Table 7[16]. By the nature of these indicators that can be achieved at the same time or around the same time as graduation of the students, it is considered reasonable to regard the year of project completion as the target year. Only Indicator 5 (status of employment or education after graduation) was assessed based on the situations at the times of both project completion and ex-post evaluation.

Table 7: Operation and Effect Indicators

	Target	Actual	Actual
	2009	2009	2014
	Completion year	Completion year	5 years after completion
(1) Indicators to show attainment of academic degrees (Operation indicators)			
Indicator 1 Number of students who obtained degrees	Bachelor: 400 persons Master: 140 persons	Bachelor: 270 persons Master: 79 persons	Same as 2009
Indicator 2 Percentage of students who obtained degrees (Graduation rate)	(Not set but assumed to be 100%)	Bachelor: 95% of entrants to JAD Program or 96% of students who were sent to Japan Master: 100% of students who were sent to Japan	Same as 2009
(2) Indicators to show academic performance of students (Effect indicators)			
Indicator 3 Grades of graduates (Percentage of students who received "Excellent")	(Not set)	Bachelor: 43% received "Excellent" Master: No data	Same as 2009

[15] Sub-rating for Effectiveness is to be put with consideration of Impact.
In this ex-post evaluation, effectiveness and impact were defined as follows, based on the objective and the logical sequencing of project components seen in the ex-post evaluation of HELP1 and ex-ante evaluation of HELP3.
- Output: Students complete the overseas study programs (graduate).
- Direct outcome (effectiveness): Students graduate and get jobs or continue to study for higher degree with capabilities to be qualified engineers.
- Indirect outcome (impact): Graduates play active roles as qualified engineers as their workplaces.

[16] In the planning stage of this ex-post evaluation, Indicator 6, "Percentage of students who obtained positions in research and development," was set. However, use of this indicator was abandoned as it was found difficult to precisely identify the status of its achievement from the data collected. Nevertheless, having confirmed sufficiently the degree of achievement of the project objective based on the other five indicators, it was judged that the non-use of this indicator would not affect the ex-post evaluation much.

(Table 7 continued)

	Target	Actual	Actual
	2009	2009	2014
	Completion year	Completion year	5 years after completion
Indicator 4 Length of years till graduation (Percentage of students who graduated in the shortest period of time)	(Not set but assumed to be 100%)	Bachelor: 227 persons (85% of graduates) Master: 79 persons (100%)	Same as 2009
(3) Indicator to show the status of employment or education after graduation (Effect indicator)			
Indicator 5 Percentage of students who obtained positions or proceeded to upper-level school in science and technology	Indicator 5 Percentage of students who obtained positions or proceeded to upper-level school in science and technology	Indicator 5 Percentage of students who obtained positions or proceeded to upper-level school in science and technology	Indicator 5 Percentage of students who obtained positions or proceeded to upper-level school in science and technology

Sources: Prepared based on JICA documents, responses from the executing agency and the beneficiary survey.
Notes: 1) Baseline value in the appraisal year was zero for all indicators (as these indicators were related to human resources that would be newly produced by this project). 2) Graduates who were not counted in Indicator 5 were those fall under the job categories that are likely to have little direct relations to science and technology (such as personnel affaires or sales divisions, restaurants and interpreting), those out of employment, those whose jobs were not clear, and those who did not answer the relevant questions in the survey.

(1) Attainment of academic degrees (operation indicators)

The number of students who obtained the degrees (Indicator 1) was below the target due to the decrease in the number of students who were sent to Japan compared to the plan at the appraisal. As the judgment on effectiveness was made based on the degree of achievement of the expected outcome through use of the outputs, this indicator, showing the absolute number of degrees awarded (i.e., primarily measuring the degree of production of the outputs), was not counted as a ground for judgment. On the other hand, percentage of students who obtained the degrees (Indicator 2), an indicator that enables a relativistic judgment based on the actual outputs, showed a high degree of achievement. Therefore, the attainment of academic degrees was judged to be good.

(2) Academic performance of students (effect indicators)

It can be said that the academic performance of students after they enrolled to universities in Japan was mostly good based on the degree of achievement of Indicator 3 and Indicator 4.

Regarding grades of graduates from the undergraduate program, 43% of the students received their average grades of "Excellent" or higher (Indicator 3)[17]. Looking at other relevant indicators, repetition rate was 15% and dropout rate was 3%. The repetition rate was a little higher than the average of all students including Japanese students[18], indicating a variation in grades among HELP2 students. Nonetheless, the rate is considered to be within an acceptable range, as it did not exceed the rough target of 15% set by the executing agency and the graduation rate (Indicator 2)

[17] The average score calculated by giving 3 points to "Very Excellent" and "Excellent," 2 points to "Good" and 1 point to "Fair" was 2.16.
[18] Referring to "*Gakko Kihon Chosa* (basic survey on schools)" of Ministry of Education, Culture, Sports, Science and Technology of Japan, an average repetition rate of universities in Japan was estimated to be around 4% in the academic year 2013.

was high. Also, according to the executing agency, these results except for the repetition rate were better than those of HELP1 even though the period of study in Japan under this project (HELP2) was one year shorter. The project consultant pointed out that it was attributed to the undergraduate education for the 1st grade students in Malaysia, which was made possible by introduction of twinning, and in which detailed instructions by Malaysian and Japanese lecturers were provided to students based on the common syllabuses developed by the consortium of Japanese universities.

Although no information was available on the academic record of students who obtained the master's degrees, it is considered that their academic performance was good since all of them received the degrees within the designated period of time.

(3) Status of employment or education after graduation (effect indicator)

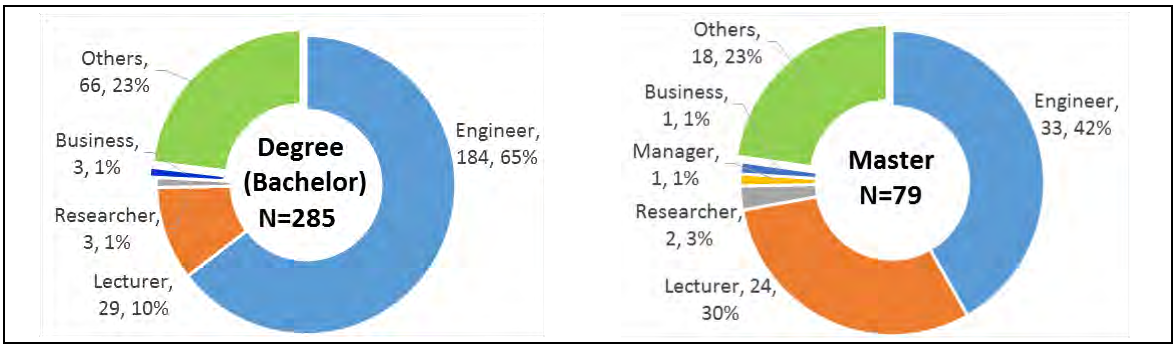
The status of HELP2 graduates' employment or education in science and technology fields after graduation was found satisfactory. The survey conducted by the executing agency to all graduates right after their graduation and the survey conducted in this ex-post evaluation (a total of 96 graduates responded)[19] both showed that most graduates have had jobs related to science and technology (Indicator 5).

The breakdown of the job status of graduates is shown in Figure 1 and Figure 2. According to the survey at the time of ex-post evaluation, the percentage of engineers decreased and that of lecturers increased compared to in the survey right after graduation. The percentages of researchers and managers also increased. The nationality of the organizations where graduates were employed became diversified from the time right after graduation when a majority of graduates had been engineers of Japanese-affiliated companies: according to the survey right after graduation, 34% of graduates from the undergraduate program had joined Malaysian companies or other organizations and 66% had joined Japanese-affiliated companies or enrolled to Japanese universities (as students); the survey at the time of ex-post evaluation found that 71% of respondents (graduates from the undergraduates program) had jobs at Malaysian companies/ organizations, 13% at Japanese-affiliated companies and 16% at companies/ organizations of other nationality. A similar trend of diversification was seen on graduates from the postgraduate program: the survey right after graduation showed that 22 out of 33 engineers had been employed by Japanese-affiliated

[19] The outline of the beneficiary survey conducted for this ex-post evaluation was as follows.

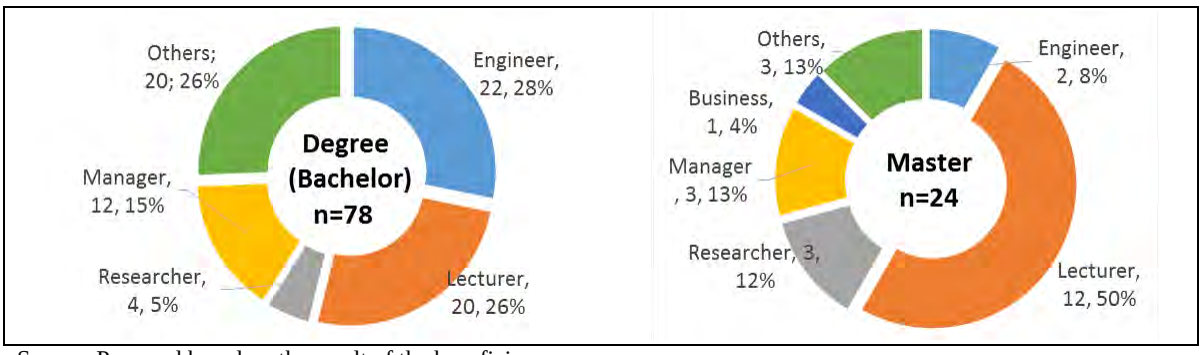
- Respondents: The evaluator delivered the questionnaire to all graduates and collected 96 valid responses (26 females and 70 males). The respondents consisted of 72 graduates from the undergraduate program, 18 from the postgraduate program, and 6 from both programs, and covered all of the five batches of HELP1 and HELP2 (this project), respectively (the respondent graduates from HELP1 were graduates from the postgraduate program of HELP2).
- Methods: Self-administered structured questionnaire delivered and collected by email; interviews with 12 respondents (the questionnaire for them was answered and collected at the time of interviews).
- Main questions: (a) Effectiveness – satisfaction with the overseas study program and career after graduation; (b) impact – use of what they learned from study in Japan.
- Supplementary information was collected from interviews with supervisors of graduates on their jobs (4 persons consisting of 2 from government organizations, 1 (Japanese) from a national university and 1 (Japanese) from a Japanese-affiliated company).

companies (details on nationality of employers in other job categories were not available), while the survey at the time of ex-post evaluation showed that 68% had jobs at Malaysian companies/ organizations, 21% at Japanese-affiliated companies and 11% at multinational enterprises[20]. Regarding the type of business of graduates' places of employment, the survey at the time of ex-post evaluation found that among 85 respondents who had jobs[21], 40 persons belonged to private companies, 4 persons belonged to private education or research institutions, 28 persons belonged to public education or research institutions, 4 persons belonged to other government organizations, 6 persons were self employed, and 3 persons gave other answers than above. No difference was seen in the trend of advancement to graduate school and employment by sex and by batch.



Source: Prepared based on documents provided by the executing agency.
Notes: 1) Students who completed the undergraduate program and continued to the postgraduate program both under this project are counted in both graphs. 2) "Others" includes consultants, interpreters, students, job seekers and those who did not provide answer.

Figure 1: Status of Employment, etc. Right After Graduation
(Survey conducted by the executing agency right after graduation)



Source: Prepared based on the result of the beneficiary survey.
Notes: 1) The six students who completed both undergraduate and postgraduate programs under this project are counted in both graphs. 2) "Others" includes consultants, interpreters, students, job seekers and those who did not provide answer.

Figure 2: Status of Employment, etc. in 5-13 Years After Graduation
(Beneficiary survey conducted at the time of ex-post evaluation)

[20] Among the 96 respondents to the beneficiary survey, 57 persons (59%) proceeded to graduate school. 42 persons of them entered graduate schools in Japan (33 persons of them received scholarships under HELP).
[21] In terms of employment pattern, the 85 respondents with jobs consisted of 78 employees, 1 employer (entrepreneur) and 6 self-employed. Besides 5 students, the number of respondents who did not have jobs was 6 including 4 females (some of them answered they were housewives).

3.3.2 Qualitative Effects

(1) Acquisition of higher level of knowledge and skills as well as Japanese work ethics and human resource development methods

Based on reports of the executing agency and the results of the beneficiary survey conducted at the time of ex-post evaluation (Figure 3), it can be said that graduates acquired scientific knowledge and technology as well as knowledge and skills of Japanese language; therefore "acquisition of higher level of knowledge and skills," an expected effect of this project, was achieved. Although "Japanese work ethics and human resource development methods," another expectation for this project, were also acquired through living and studying in Japan (especially, acquisition of Japanese work ethics was agreed by many respondents as shown in Table 3), some respondents said they acquired them through working with Japanese-affiliated companies after graduation from university.

(2) Graduates' satisfaction

The beneficiary survey results show high degree of satisfaction with this project (Figure 3).

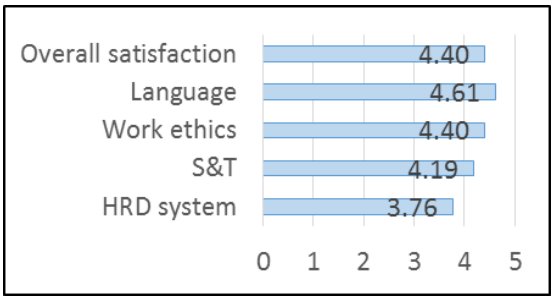


Figure 3: Knowledge and skills that graduates acquired from this project and graduates' satisfaction with the project (n=96)

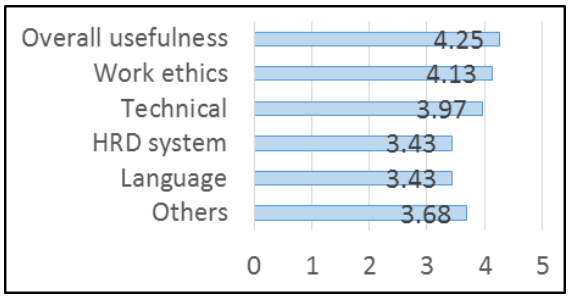


Figure 4: Extent to which graduates use knowledge and skills they acquired from this project in their jobs (n=96)

Source: Both Figure 3 and Figure 4 were prepared based on the results of the beneficiary survey.
Notes: 1) Each score is the average of responses to the question ranging from 1 point ("Strongly Disagree") to 5 points ("Strongly Agree"). 2) "Language" refers to Japanese language. 3) "Work ethics" refers to Japanese work ethics. 4) "S&T" stands for science and technology. 5) "HRD" stands for human resource development. 6) "Others" in Figure 4 includes communication, problem-solving, analytical skills, etc.

3.4 Impacts

3.4.1 Intended Impacts

"Contribution to Malaysia's economic development through promotion of science and technology," the expected impact of this project, was observed.

Science and technology-related industries (e.g. manufacturing, knowledge-intensive service industry, and education to produce human resources for the above-mentioned industries) have continued to play an important role in the Malaysian economy[22]. The beneficiary survey found that

[22] The value-added of the knowledge- and technology- intensive industries (defined as high-tech manufacturing products

graduates produced under this project have actively played their respective roles in such industries and higher education services using what they had learned in Japan. A number of respondents said that Japanese work ethics and specialized expertise were particularly useful. For example, a majority of graduates who were already in a position to instruct their subordinates pointed out discipline and time management that they had learned in Japan helped them instruct their staff or lead their teams. Also, according to some respondents, they were aware that they had gained advanced knowledge and experiences with public money, and thus regarded it important to give such benefits back to the Malaysian society and economy (Figure 4 and Box 1). The interviews with graduates revealed that there are many cases where graduates no longer use the knowledge of the fields they had majored in at Japanese universities or Japanese language due to career change or promotion. Nevertheless, a certain number of respondents acknowledged that their engineering background was still of help.

(such as semiconductors) and knowledge-intensive services (such as financial and communications services) in the MOSTI website) increased, particularly contributed by the growth of the knowledge-intensive services, from 87.1 billion ringgit (approximately 2.5 trillion yen) in 2000 to 141 billion ringgit (approximately 3.8 trillion yen) in 2010. On the other hand, the share of the knowledge- and technology-intensive industries in Malaysia's gross domestic product (GDP) dropped from 25% to 18% during the same period (source: MOSTI statistics). The number of Japanese-affiliated companies in Malaysia was 1,409 as of August 2012, and 52% of them were manufacturing companies such as electric-electronic parts. The new entry of Japanese-affiliated companies to the Malaysian market slowed down in the labor-intensive manufacturing industry, while it increased in the services industry. While the amount of foreign direct investment to Malaysia showed a slight decrease, Japan was the largest investing countries (2.8 billion ringgit (approximately 72.3 billion yen) in 2012) (sources: "Malaysia Handbook 2014," the Japanese Chamber of Trade and Industry, Malaysia (JACTIM) and an interview with JACTIM. The yen values of the figures were calculated using annual exchange rates announced by International Monetary Fund (IMF)).

Box 1: Cases of Status of Graduates

Case 1: University. After obtaining the doctorate degree in Japan, the graduate returned to Malaysia as a lecturer in electronic engineering of Malaysia-Japan International Institute of Technology (MJIIT), to which Japan is providing assistance through an ODA Loan Project[23] aiming to establish a Japanese-style engineering education system. She had achieved a high level of performance such as receiving a prestigious award from an academic society of the United States during her postgraduate period. Her academic advisor in Japan (who was also a lecturer of MJIIT at the time of ex-post evaluation) also highly acknowledged her talent. She commented, "It was attractive to work in Japan (note: she once joined a Japanese semiconductor company after receiving her master's degree), but I wanted to contribute to development of education in Malaysia by using the experiences and knowledge I got in Japan in the Japanese style education of MJIIT."

Case 2: University. The graduate obtained the doctorate degree in Japan and returned to Malaysia. After establishing and running a business, he became a lecturer in automotive engineering of the National University of Malaysia. He commented, "With the money that was spent for my study in Japan, 30-40 students could have studied in Malaysian universities. Therefore, I wanted to bring benefits back to at least that number of students." (Photograph is shown on the first page of this report)

Case 3: Manufacturing company. The graduate is the manager of a paint shop of a Malaysian car manufacturer (with Japanese capital). The manager of a recently built second paint shop is also a HELP2 graduate. They contributed a lot to technology transfer from Japan in terms of both technical knowledge and Japanese language skills. A co-manager dispatched from Japan highly acknowledged their performance and Japanese language abilities. (Upper right photograph)

Case 4: Information Technology (IT) services. The graduate is a manager in the IT support center of one of the biggest multinational IT solution company. She supervises her staff to respond to customers in Asia in Japanese and other languages, and has received recognition and awards for her outstanding performance at the Asian level. (Left photograph)

Case 5: Malaysian governmental organization. The graduate serves in Malaysian Communications and Multimedia Commission (MCMC). His supervisor highly valued his disciplined attitude and time management skills. She commented, "Japanese workplace culture somehow works in a government organization, where there is a clear hierarchy." (Lower right photograph, with the supervisor)

Case 6: Malaysian governmental organization. The graduate serves in Multimedia Development Corporation Sdn. Bhd. (MDEC). Her supervisor highly valued her language abilities and communication skills. Although her current job is promotion of investment (including investment from Japan), her engineering background is an advantage. Also, the attitude of analyzing and examining things in detail and problem-solving approaches she acquired in Japan are useful for her work.

(Source: Beneficiary survey)

[23] "Development Project for Malaysia-Japan International Institute of Technology (MJIIT)" (Loan Agreement signed in 2011).

3.4.2 Other Impacts

No negative impacts were observed. As a positive impact, a way to reduce cost for study in Japan was found by the introduction of twinning to this project. According to a study by JICA Research Institute[24], there was no significant difference between those who graduated from the undergraduate program of this project (i.e. stayed in Japan for three years) and those who completed the "traditional" study-in-Japan program (i.e. stayed in Japan for four years) in terms of their employment status, job ranks, salaries and so forth, and therefore, cost effectiveness of twinning was proven. Also, YPM acquired know-how of twinning through implementation of this project, which led to the realization of the "3+2" system in the subsequent phases of HELP (HELP3 and MJHEP)[25]. In those phases, YPM has gradually replaced Japanese lecturers with Malaysian lecturers for the part of education in Malaysia.

As an impact on Japanese universities, internationalization of universities was promoted[26]. The project consultant commented that particularly for the private universities that had not yet accepted many international students, this project played a pioneering role in promoting their preparation and management to receive international students. Also, based on the consortium of Japanese universities formed for this project, the Registered Non-Profit Organization Japanese University Consortium for Transnational-education (JUCTe) was established in 2006 as an organization to support international students. JUCTe is involved in the implementation of MJHEP that is equivalent to HELP4.

In addition, as Box 1 shows an example, an impact was found on Japanese-affiliated companies such as smooth promotion of shifting of plants and technology transfer as the graduates played their role as bridge engineers (human resources to serve as an intermediary between the partner country and Japan).

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

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[24] Yoshiko Koda and Takako Yuki, "The Labor Market Outcomes of Two Forms of Cross-Border Higher Education Degree Programs between Malaysia and Japan" in "Analysis of Cross-Border Higher Education for Regional Integration and Labor Market in East Asia," JICA RI Working Paper, JICA Research Institute, 2012. The study covered HELP3 graduate as well.

[25] The continuation of twinning-based HELP also led to the authorization of the JAD Program as a diploma-awarding institution. Although the JAD Program had been authorized as a pre-matriculation education institution called the Japan Matriculation Center (JMC) in 1991 (at the time of commencement of HELP1), it had not been allowed to award degrees that are effective in Malaysia. Similarly, the JAD Program under HELP2 (this project) could not certify students who completed it to be eligible to transfer to universities in Malaysia, as HELP2 applied the "2+3" twinning system that provided only one-year undergraduate education in Malaysia, which did not satisfy the requirement for transfer (i.e. two years or longer). Since HELP3 (2008-), with introduction of the "3+2" system, two-year undergraduate education has been provided in Malaysia, and thus awarded the diploma to students who completed the JAD Program. With the diploma, students can transfer to Malaysian universities at their 3rd grade in case they would not go to Japan.

[26] Interviews with stakeholders from the cooperating Japanese universities were not possible, as the key persons had already retired. Instead, information was collected from existing documents and interviews with the project consultant.

3.5 Sustainability (Rating: ③)

On each of the following aspects, sustainability was evaluated in two dimensions: (1) whether sustainability of effects brought about by the graduates under this project is secured (i.e. sustainability of project effects); and (2) whether the executing agency continues programs to support overseas study (i.e. sustainability of overseas study programs). The second dimension was used only in a supplementary manner, as it was not the main objective (effect) of this project.

3.5.1 Institutional Aspects of Operation and Maintenance

The system of operation and maintenance has mostly been established. (1) Regarding sustainability of effects of this project, there are some follow-up mechanisms for graduates such as the Return to Malaysia Program and the alumni association. The Return to Malaysia Program is organized every year by YPM for fresh HELP graduates. During the program of three days and two nights, graduates participate in activities such as reporting on their stay in Japan and lectures and discussions on working in Malaysia, etc. During the program, YPM collects the baseline data for its tracer study. Also, YPM organizes the Home Coming Day every year. In this event, YPM invites HELP graduates to the JAD Program and have them speak to current students, thereby enhancing educational effects on students and maintaining communications with the graduates.

As the alumni association of HELP, YPM established the Japan Alumni of Yayasan Pelajaran MARA (JAPEMA) in 2006. JAPEMA is entrusted with the tracer study of HELP graduates by YPM. Since establishment up to the time of ex-post evaluation, one HELP graduate has managed to operate JAPEMA as the representative. At the time of ex-post evaluation, JAPEMA is an unregistered organization, and its activities have been carried out on a voluntary basis. However, YPM is planning to register JAPEMA as a non-profit organization (a society registered to the Registry of Society (ROS)).

Although there had been no particular mechanism to proactively use the outcome of study in Japan in employment in Malaysia, there was no problem with that as most students had decided on their jobs before they returned to Malaysia[27].

(2) Sustainability of overseas study programs has been secured. The status and organization of YPM as a subordinate organization of the Majlis Amanah Rakyat (MARA) (Indigenous People's Trust Council) under the Ministry of Entrepreneur and Cooperative Development have not been changed since the time of project completion. The HELP unit of YPM has implemented HELP3 and MJHEP.

[27] Since 2011, there have been several facilities such as TalentCorp (a government organization in charge of development of high-level human resources in Malaysia (e.g. through internship, and scholarship) and invitation of Malaysian living abroad back to the country) and the Management Apprenticeship Programme of the Public Service Department that provides graduates of overseas study programs under the Look East Policy with opportunities of three-month apprenticeship at the collaborating companies, government organizations, etc.

3.5.2 Technical Aspects of Operation and Maintenance

No problem was seen in terms of technical aspects of operation and maintenance. (1) Sustainability of effects of this project is not applicable by the nature of this project that the degree of maintenance of knowledge, etc. learned from study in Japan depends on individual graduates. (2) As for sustainability of overseas study programs, YPM has necessary skills as it has implemented HELP3 and MJHEP with twinning smoothly (see also "3.4.2 Other Impacts").

3.5.3 Financial Aspects of Operation and Maintenance

No problem was seen in terms of financial aspects of operation and maintenance. (1) Sustainability of effects of this project is not applicable by the nature of this project. (2) As for sustainability of overseas study programs, although the amount data were not available on financial sources and balance related to YPM's overseas study programs including the JAD Program, it can be said that there is no financial problem as YPM has implemented MJHEP, the successor project of HELP, without external financial assistance.

3.5.4 Current Status of Operation and Maintenance

No problem was seen in the status of operation and maintenance. (1) Sustainability of effects of this project is not applicable by the nature of this project. (2) As for sustainability of overseas study programs, the education and laboratory equipment procured under this project were handed over to the successor project and utilized. After that, most of the equipment past the service life and ended their role. It was observed in the site visit for the ex-post evaluation that the educational equipment procured in the subsequent phases was well maintained[28].

A class for the 1st grade undergraduate students of the JAD Program of MJHEP that was going on at the time of ex-post evaluation (MARA University of Technology)

Fluid viscometers procured under this project. Still used by the 2nd grade undergraduate students of the JAD Program (MARA University of Technology)

School building where the JAD Program was implemented under this project. It belonged to YPM College at that time, and to MARA Polytechnic College at the time of ex-post evaluation.

[28] The venue of the JAD Program have been changed from YPM College Bangi (HELP1 and HELP2), to the University of Selangor (HELP3) and then to MARA University of Technology (MJHEP), according to the scale of education required in each phase. The equipment procured under this project was moved to the new venues, and it was confirmed that some equipment was still kept at MARA University of Technology. YPM College was changed to MARA Polytechnic College (KPTM), and there is no relationship between KPTM and HELP.

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project is the second phase of a series of projects called HELP that aims at human resource development in science and technology by providing support to Malaysian students for study at universities in Japan. Under this project, a total of 270 undergraduate and 79 graduate students obtained the bachelor's and master's degrees, respectively, in Japan. Relevance of the implementation of this project is high mainly because its objective is consistent with Malaysia's development policies and needs related to (i) promotion of knowledge- and technology-intensive economy through development of high-level human resources and (ii) in doing so, learning from Far East Asia including Japan. Efficiency is evaluated to be fair mainly as the project sent a smaller number of students to Japan than planned, while the project cost was within the plan. Effectiveness and impact are high since most students completed their programs with good grades and are active as engineers, lecturers, etc. using what they had learned in Japan such as work ethics of Japan and knowledge and skills in specialized fields. The undergraduate program of this project is characterized by "twinning," with which part of undergraduate education is provided in Malaysia, and students transfer to universities in Japan in the middle of the program. The introduction of twining made an impact on reduction of cost of study in Japan that had been said to be high as well as improvement of twinning in the next HELP that led to the improved efficiency and effectiveness of study in Japan. As for sustainability, no problem was seen in terms of both follow-ups for graduates produced under this project and continuation of overseas study programs by the executing agency.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) YPM is recommended to maintain the current good implementation status of MJHEP.

(2) YPM is recommended to continue to follow up HELP graduates. This would be beneficial in such ways that (i) knowing about achievement of graduates would improve motivation of current students, (ii) graduates would be more aware that they are valuable as being equipped with high level knowledge and understanding of Japan, which would eventually enhance the effect of study in Japan. As the tracer study of graduates takes a lot of time and effort, it is also important to accomplish the planned registration of JAPEMA to ROS in order to maintain and reinforce the conduct of study and use of the study results without relying on voluntary work.

4.2.2 Recommendations to JICA

The higher education human resources who were developed by this project and who have gained a good understanding of Japan should be regarded as resource persons for future cooperation projects with Malaysia. Therefore, information on those human resources should be maintained and updated as much as possible. So far, a tracer study was conducted by the JICA Research Institute in 2012, and updated information has been obtained from the executing agency in relation to HELP3 that was still ongoing. After completion of HELP3 as well, it is desirable that JICA collect the updated information as much as possible.

4.3 Lessons Learned

Setting the target number of students and cost estimation in overseas study projects

In this project, the planned number of students to be sent to Japan was reduced during the implementation, as the cost estimation at the appraisal cut the unit cost for study in Japan to minimum without allocation to stay in Japan for taking exam for transfer admission and one-year repetition (that was permitted in the rule), and the Malaysian government increased the cost for overseas study. In a future project to provide support for overseas study, a precise cost estimation linked to setting of the target number of students is important for ensuring the expected effect in quantitative terms (it will also be good to set a minimum requirement such as “at least XXX persons,” as this project did when it revised the planned number). Although it was difficult in this project due to the economic conditions of Malaysia at that time, it should be considered in the planning stage to articulate that even in case where the ODA Loan fund cannot cover the planned number of students due to cost increase, the target number should be kept by increasing funding from the partner country.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1.Project Outputs		
(1) Overseas study program for undergraduate students	400 persons	280 persons (of which 270 graduated)
(2) Overseas study program for postgraduate students	140 persons	79 persons (all graduated)
(3) Procurement of equipment	Education and laboratory equipment for Computer Laboratory and Engineering Laboratory	Places of installation were as planned 722 pieces
(4) Dispatch of teaching staff	Science and engineering, general education, Japanese language 1,738 man-months	Subjects were as planned 1,332 man-months
(5) Consulting services	146 man-months	Same as planned
2.Project Period	April 1999 – March 2008 (108 months)	April 1999 – March 2009 (120 months)
3.Project Cost		
Amount paid in Foreign currency	5,484 million yen	4,880 million yen
Amount paid in Local currency	706 million yen (22 million ringgit)	966 million yen (31 million ringgit)
Total	6,190 million yen	5,846 million yen
Japanese ODA loan portion	5,285 million yen	4,984 million yen
Exchange rate	1 ringgit = 31.9 yen (As of November 1998)	1 ringgit = 30.5 yen (Average between 1999 and 2009)

Islamic Republic of Pakistan

Ex-Post Evaluation of Japanese ODA Loan Project

"Balochistan Middle Level Education Project"

External Evaluator: Nobuyuki Kobayashi, OPMAC Corporation

0. Summary

The objective of this project is to increase the number of children enrolled in lower secondary education[1] in the target schools and widen the coverage of technical education by constructing middle schools and Technical Trade Centers and by training teachers, thereby contributing to equal educational opportunity for boys and girls in the Province of Balochistan.

At the time of both the appraisal and the ex-post evaluation, the Pakistan government regarded reducing educational disparity as one of its important policy goals. Solving a bottleneck in lower secondary education and improving access to education for girls was needed particularly in the Province of Balochistan. Thus, the relevance of this project is high as this project has been highly relevant to the country's educational policy and development needs, as well as Japan's ODA policy. While the cost of this project decreased due to the depreciation of the local currency against the yen, the completion of the project was delayed significantly because of delays in the procurement process and a longer construction period. Based on the above, efficiency of the project is fair. At the time of the ex-post evaluation, this project upgraded 200 target schools (80 boys' schools and 120 girls' schools) to middle schools and the number of students in these schools achieved approximately 80% of the target. While the number of male students reached approximately 60% of the target, the number of female students was almost as planned. Out of an increase in the number of schools providing lower secondary education in the period "before" and "after" project implementation, schools upgraded by this project accounted for approximately 20% in the province. An increase in the number of students in lower secondary education in the project's target schools accounted for 10% of that in the province for the same period. On the other hand, due to a policy change in the Balochistan government, technical education was conducted in higher secondary education. Formal technical education was not carried out in the target schools. Thus, effectiveness and impact of the project are fair. On sustainability of this project, operation and maintenance responsibilities for facilities and equipment were clearly defined. The technical level was appropriate for the construction of facilities and the provision of equipment. Budget for secondary education had been increasing. As no major problem was found in intuitional, technical, and financial aspects, the sustainability of the project effects is high.

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

[1] In the Pakistan school system, primary education covers from the first to the fifth grade, lower secondary from the sixth to the eighth grade, and higher secondary education from the ninth to the tenth grade. Both primary education and secondary education are conducted in the same school. Primary schools provide primary education, middle schools provide primary education and lower secondary education, and high schools provide all levels: primary education, lower secondary education, and higher secondary education.

1. Project Description

Project site

Target school of this Project
(Nodiz Girl's Middle School)

1.1 Background

The Balochistan province is located in the south-western part of Pakistan and its vast territory accounts for more than 40% of the country. In the mid-1990s, the construction of schools in the Balochistan province was less than other provinces and the number of schools was considered insufficient compared to the number of students. In particular, the number of middle schools was much smaller than that of primary schools and, therefore, lower secondary education became a bottleneck for further education. In 1995, prior to the project's commencement, the number of middle schools was less than 10% of the number of primary schools and many classrooms could not be used for lessons due to the age of the school buildings and the lack of equipment. Lower secondary education was based on a single-sex system in Pakistan. As the number of girls' schools was smaller than that of boys' schools, girls faced constraints in access to lower secondary education. This tendency was remarkable in Balochistan as boys' schools accounted for more than 80% of the middle schools during the mid-1990s. In tandem with the vast territory of the province, an opportunity to have secondary education was slim for girls except in the provincial capital Quetta.

To cope with these challenges, the Pakistani government had an education policy to alleviate regional and gender disparities. In line with the policy objective, this project was designed to be launched in the Balochistan province where these disparities were significant. This project built facilities to conduct secondary education in primary schools in order to upgrade the existing schools to middle schools.

1.2 Project Outline

The objective of this project is to increase the number of children enrolled in lower secondary education in target schools and widen the coverage of technical education by construction of middle schools (80 boys' school and 120 girls' school) and Technical Trade Centers and by

training teachers, thereby contributing to equal educational opportunity for boys and girls in the Province of Balochistan.

Loan Approved Amount/ Disbursed Amount	3,917million yen / 1,510million yen	
Exchange of Notes Date/ Loan Agreement Signing Date	August 1996 / March 1997	
Terms and Conditions	Interest Rate Repayment Period (Grace Period) Conditions for Procurement:	2.3% 30 year (10 year) General untied (Consulting service is general untied)
Borrower / Executing Agency	The President of the Islamic Republic of Pakistan / Education Department, Government of Balochistan	
Final Disbursement Date	November 2011	
Main Contractor (Over 1 billion yen)	-	
Main Consultant (Over 100 million yen)	Oriental Consultants Co., Ltd. (Japan) /International Consulting Engineers of Pakistan (Pakistan) /National Engineering Corporation (Pakistan) (JV)	
Feasibility Studies, etc.	-	
Related Projects	-	

2. Outline of the Evaluation Study

2.1 External Evaluator

Nobuyuki Kobayashi, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – October 2015

Duration of the Field Study: May 9, 2015 – May 18, 2015

2.3 Constraints during the Evaluation Study

The external evaluator could not enter the project area and inspect constructed facilities since security concerns limited the Field Study to Islamabad. For this reason, the judgement regarding the sustainability of the project is based on information regarding institutional, technical, and financial aspects.

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

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Pakistan

At the time of appraisal, the Eighth Five-year Plan (FY 1992/93 - FY 1997/98), prioritized tasks in the educational sectors including reduction of gender and regional disparities in education, qualitative improvement of education such as more educational facilities and equipment, a curriculum to meet demand, and expansion and qualitative improvement of technical education for better employment opportunities. In addition, the plan also supported the acceleration of the Social Action Plan (hereinafter referred to as "SAP"). SAP aimed at social development and covered education, poverty alleviation, improvement of sanitary conditions, and women's empowerment. As the four policy priorities of SAP included basic education, SAP planned for improvement in school environments, teacher training and deployment, and the construction of school buildings.

At the time of the ex-post evaluation, the Vision 2025, a long-term national development plan which was approved in 2014, pointed out that enrollment rates were low at all educational levels and that enrollment rate significantly dropped from primary to secondary education and from secondary to higher education. The strategy also mentioned that the enrollment rate for girls was lower than that for boys and recognized gender disparity as a policy issue. The National Educational Policy (2009) emphasized that (1) access to education should be broadened to include all people and (2) the quality of education should be improved in line with the needs of the Pakistan economy. Based on the second priority, the policy aimed at formal technical education to reflect the private sector's opinion and local needs. Furthermore, the Balochistan Education Sector Plan 2013-2018 had set specific targets on access to education. These targets were to increase the gross enrollment ratio[4] of lower secondary education from 26% in FY 2010/11 to 32% in 2017/18 and to improve the gender disparity index[5] for lower secondary education in public schools from 0.57 to 0.62 during the same period. In order to promote the improved access to lower secondary education, the plan also recommended that the ratio of primary schools to middle schools should be 1:3 with an emphasis on girls' schools.

At the time of both appraisal and the ex-post evaluation, the long-term national development plans and the sector plans recognized closing educational disparities as a crucial policy goal. The Balochistan province is an area where gender and regional disparities were significant in education. As lower secondary education had become a bottleneck in the province, policy actions were strongly demanded. The project

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

[3] ③: High, ② ¥: Fair, ①: Low

[4] Gross enrollment ratio is the ratio of total enrollment to the population of the age group that officially corresponds to the level of education.

[5] Gender disparity index is calculated by dividing gross enrollment ration of girls by that of boys.

implementation in the province was justified for the achievement of the policy goals.

For the above reasons, the implementation of this project has been consistent with the development plan in Pakistan.

3.1.2 Relevance to the Development Needs of Pakistan

At the time of appraisal, the insufficient number of middle schools had been a factor behind the difficulty in advancing to lower secondary education (Sixth to Eighth grades). Access to lower secondary education was particularly difficult for girls. In FY 1994/95, the Balochistan province had 8,011 primary schools (6,791 boys' schools and 1,220 girls' schools), 623 middle schools (531 boys' schools and 92 girls' schools), and 361 high schools (296 boys' schools and 65 girls' schools). Many of the schools could provide education only from the first to fifth grade and, in conjunction with this situation, insufficient number of middle schools caused limited access to lower secondary education. On the availability of middle and high schools, a girls' school was built for every 2,211 km^2. Such geographical factors make it difficult for female students to commute for lower and higher secondary education.

At the time of ex-post evaluation, access to lower secondary education in the Balochistan province could be improved much further. The data in FY 2013/14 showed that the Balochistan province had 10,585 primary schools (7,807 boys' schools and 2,778 girls' schools), 1,165 middle schools (670 boys' schools and 495 girls' schools) and 783 high schools (550 boys' schools and 233 girls' schools). Compared with the desirable ratio in the Balochistan Education Sector Plan (Middle School: Primary School = 1:3), the ratio remained 1:9 at the time of the ex-post evaluation. On the availability of middle school and high school, a girls' school was built for every 484 km^2.[6] Nevertheless, the number of girls' school fell far short of that of boys' school and this suggested girls still had a geographical problem in regards to access to lower secondary education. The net enrolment rate of lower secondary education in FY 2012/2013 reached 14% for the Balochistan province but it was lower than the national average 22% and remained less than one third of Balochistan's net enrolment ratio[7] of primary education (45%). The net enrolment rate showed an uneasy transition to lower secondary education. Furthermore, it was pointed out that the literacy rate for 10 years old or above in the Balochistan province was lower than the national average in Pakistan and had a significant gender disparity (see Table 1). Educational opportunities in the Balochistan province had a gender disparity and, moreover, they were scarcer than in other provinces.

[6] In Japan, the total number of middle schools (including national, public, and private schools) was 10,699 in FY 2012 (MEXT "Report on School Basic Survey JFY H24"). There was one middle school per 35km^2.

[7] Net enrollment ratio is defined as the ratio of children of official school age who are enrolled in schools to the population of the age group that officially corresponds to the level of education.

Table 1: Literacy Rate by Province (for 10 years old or above)

Province	Male	Female	Total
Pakistan	71%	48%	60%
Punjab Province	71%	54%	62%
Sindh Province	72%	47%	60%
Khyber Pakhtunkhwa Province	70%	35%	52%
Balochistan Province	62%	23%	44%

Source: Pakistan Bureau of Statistics (2014) "Pakistan Social and Living Standards Measurement 2012-13"

Based on the emphasis on better access to lower secondary education at the time of both appraisal and the ex-post evaluation, this project is considered consistent with the development needs of Pakistan.

3.1.3 Relevance to Japan's ODA Policy

At the time of appraisal, a country assistance strategy was not prepared for Pakistan. Nevertheless, in the Official Development Assistance White Paper 1997, which was published by the Ministry of Foreign Affairs of Japan, the country assistance policy regarded the social sector as one of the four priority sectors and emphasized assistance to basic education and better female education at the primary level. This project intended to expand and repair school buildings and provide equipment for basic education. Therefore, this project is considered consistent with the Japanese ODA policy.

3.1.4 Appropriateness of Project Approach

The implementation of this project was divided into three phases. JICA planned to implement each of the next phases after assessing the implementation progress at the end of each phase. There were concerns that insufficient budget allocation for the executing agency (for salaries of teachers, purchase costs of materials) could result in an inadequate soft component, though the ODA loan project would sufficiently complete the hard component. Intensive implementation, therefore, was carefully handled In particular, the project scope relevant to technical education was conducted on a pilot basis. This decision was based on the fact that the lack of teachers and equipment had led to the suspension in technical education for five years. Upon the reintroduction of technical education, it was necessary to implement this component while assessing the implementation capacity of the executing agency. Therefore, the implementation of this component could continue only if JICA approved the next phase by assessing the performance of technical education (budget allocation, employment of teachers, development and distribution of teaching materials).

Sufficient budget could not be allocated for technical education at the time of the project's implementation and, moreover, teacher placement, and the development and distribution of teaching materials were unsatisfactory. Based on this performance, it was decided that

assistance to technical education was carried out only in the Phase 1. The final project design is considered appropriate because it assumed that the technical education component was on a pilot basis. A reduction in the technical education component cannot be considered a flaw in the project approach.

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

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

For the expansion of lower secondary education (a major component of this project), the output has been achieved as planned (see Table 2). On the other hand, the outputs for the diffusion of technical education and the hostels for female teachers were reduced substantially. While the Japanese ODA loan was supposed to be utilized for infrastructure development of this project, the executing agency was responsible for financing a soft component (teacher salaries and purchases of teaching materials). As the component for the diffusion of technical education was conducted on a pilot-basis, it was agreed at the appraisal that JICA would make a decision as to the continuation of the component by assessing the executing agency's performance during project implementation. At the project implementation phase it was determined that the budget for technical education was small and the placement of teachers and the distribution of teaching materials were inadequate. For this reason, it was decided to reduce the number of school classrooms for home economics and technical education (Technical Trade Centers, hereinafter referred to as "TTC") and the training of teachers for home economic and technical education. As educational projects cannot realize project effects solely based on infrastructure, this scope reduction is considered appropriate. Moreover, the hostels for female teachers were also reduced as a new policy to hire teachers from areas nearby the schools was implemented in 2000. Except for urban areas, Balochistan province has a conservative culture and would find it difficult to accept teachers from outside the local community. In particular, it was difficult for female teachers to stay alone without a family. The consulting service for this project was composed mainly of progress monitoring of the construction works.

Table 2: Project Outputs (Planned/Actual)

Items	Plane (before project implementation)	Actual (at ex-post evaluation)
1. Expansion of Secondary Education	Upgrading schools to middle schools including the construction of class rooms and furniture & the provision of equipment for (200 schools, 80 boys' and 120 girls' schools)[8]	As planned
2. Diffusion of Technical Education	Construction of TTCs in middle schools and provision of equipment (52 schools, 39 boys' and 13 girls' schools), Training of 208 teachers	Construction of TTCs in middle schools and provision of equipment (10 schools, 6 boys' and 4 girls' schools), Training of 40 teachers
3. Improvement of Primary and Middle Schools	Repair of buildings, furniture & equipment for schools related to (1) and (2) above (252 schools)	Repair of buildings, furniture & equipment for schools related to (1) and (2) above (210 schools)
4. Hostels for Female Teachers	Construction of Hostels for female teachers (25 hostels), furniture & equipment	Construction of Hostels for female teachers (1 hostels), furniture & equipment
5. Consulting Service	International 30M/M National 120M/M	International 30M/M National 324M/M

Source: documents provided by JICA, and questionnaire answers from Education Department, Government of Balochistan

Photo 1: Science Kit (middle school)
(At the Time of Equipment Procurement)

Photo 2: Desks and Chairs (middle school)
(At the time of the Ex-post Evaluation)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 3,716 million yen compared to the originally planned 4,642 million yen project cost. Since the output of this project was adjusted, the planned project cost was estimated using the actual output. The planned project cost was reduced by 545 million yen and became 4,097 million yen. Even with this adjustment, the actual project cost was lower than planned (91% of the planned project cost). The change of project output was due to the reduction of the project scope related to the dissemination of

[8] The conditions for upgrading to middle schools include classrooms to accommodate students from the sixth to the eighth grades and the construction of science rooms.

technical education and the construction of hostels for female teachers. In addition, the depreciation of the Pakistan rupee against the Japanese yen was the main reason for the lower actual project cost compared to the planned project cost.

3.2.2.2 Project Period

As shown in Table 3, the planned project period was 70 months from March 1997 (Loan Agreement of the Japanese ODA loan) to December 2002. The actual project period was significantly longer than planned and took 168 months from March 1997 to February 2011(240% of the planned project period). Even after the completion of the loan disbursement in November 2010, the construction of some schools (seven schools) continued and, therefore, the project completion was in February 2011.

As for reasons behind the delay, the assignment of a project director in the executing agency was delayed until April 1998 and it took a longer time to finalize an internal arrangement to implement the project within the executing agency. Furthermore, the executing agency was unfamiliar with procurement procedures for Japanese ODA loan projects. The consulting service commenced in February 2000 which constituted a 33 months delay from the original schedule. The delay in the commencement of consulting service caused the delay of the construction work and, moreover, the actual construction period was 117 months in comparison to the planned period of 60 months. The construction delay was mainly due to security concerns in the project area, bad weather, contractors' insufficient working capital, and difficult access to project sites.

Table 3: Project Period (Planned and Actual)

Items	Planned	Actual
1. L/A Signing	March 1997	March 1997
2. Civil Works	January 1998 – December 2002	January 2001 – February 2011
3. Procurement of Furniture and Equipment	January 1998 – December 2002	August 2002 – October 2010
4. Teachers' Training	April 1998 – December 2002	December 2002 – August 2003
5. Consulting Service	May 1997 – December 2002	February 2000 – January 2010
6. Project Completion	December 2002	February 2011
7. Overall	March 1997 – December 2002 (70 months)	March 1997 – February 2011 (168 months)

Source: documents provided by JICA and questionnaire answers from Education Department, Government of Balochistan

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

Neither the Financial Internal Rate of Return (FIRR) nor the Economic Internal Rate of Return (EIRR) was not calculated for this project at the time of appraisal. Moreover, this project has no financial benefit and estimating economic benefit is difficult due to the lack of information on the recruitment of target school graduates. For these reasons, this ex-post

evaluation does not calculate the internal rate of return.

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

3.3 Effectiveness[9] (Rating: ②)

The project scope can be divided into three objectives: (1) the expansion of lower secondary education, (2) the diffusion of technical education, and (3) the provision of residence for female teachers. In the actual project cost breakdown (excluding unclassifiable costs such as consulting services, administration costs, and tax), the expansion of lower secondary education accounted for 95.6% of the total cost, the diffusion of technical education for 4.1%, and the provision of female teachers' residences for 0.3%. Based on the actual project cost weighting, judgement was based mainly on the attainment of the targets for the expansion of lower secondary education.

Photo 3: Lesson at K. Zangi Boys' High School
(At the Time of the Ex-post Evaluation)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

Regarding the analysis of the project's quantitative effect, an increase of the prescribed number of students for lower secondary education in the target schools and the actual number of students for lower secondary education in the target schools were chosen respectively for an operation indicator and an effect indicator for (1) the expansion of lower secondary operation. The number of students for technical education in the target school is an effect indicator for (2) the expansion of technical education. The number of users in hostels for female teachers was chosen as an effect indicators for (3) the provision of residence for female teachers.

(1) Expansion of Secondary Education

The target schools of this project were primary schools (80 boys' schools and 120 girls' schools for a total of 200 schools). In order to upgrade these schools to middle schools, this project assumed that the prescribed number of students in lower secondary education would be 100 students for each boys' school and 50 students for each girls' school. The increase of

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

the prescribed number for students was expected to be 14,000 students in total. The construction works of this project were in line with the original plan and the target schools were upgraded to middle schools by the time of the project completion. Therefore, it is concluded that the prescribed number of students increased as planned at the time of appraisal.

Table 4: Number of Students in Lower Secondary Education

		Baseline	Target	Actual		
		FY 1994/95	FY 2002/03	FY 2011/12	FY 2012/13	FY 2013/14
		Baseline Year	2 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion
Number of Students in Lower Secondary Education	Number of Male Students in Lower Secondary Education (persons)	0	7,300	3,439	3,830	4,513
	Number of Female Students in Lower Secondary Education (persons)	0	5,050	3,688	4,160	4,913
	Total	0	12,350	7,127	7,990	9,426

Source: documents provided by JICA, and questionnaire answers from Education Department, Government of Balochistan

Note: The target for the number of students in lower secondary education is for 174 schools in which data for the number students are available. Time series comparison requires precaution as the actual numbers of students in lower secondary education are: 139 schools (boys' 53 schools and girls' 86 schools) in FY 2011/12, 153 schools (boys' 57 schools and girls' 96 schools) in FY 2012/13, and 174 schools (boys' 73 schools and girls' 101 schools) in FY 2013/14.

At the time of appraisal, the number of students for lower secondary education in the target schools was assumed to surpass the prescribed number of students. In 174 schools (73 boys' schools and 101girls' schools) where student data were available at the time of ex-post evaluation, the number of students for lower secondary education was 9,426 students (4,513 boys and 4,913 girls) in FY 2013/14 fiscal year (see Table 4). Since the prescribed number of students for 174 schools was 12,350 students in total (7,300 boys and 5,050 girls), the number of students attained 76% of the target (62% for boys and 97% for girls). The number of boys reached approximately 60% of its target and that of girls almost reached its target. The reason that the number of boys was below the target at the time of appraisal was that many boys were engaged in animal husbandry and farming in the rural areas where this project was focused and dropped out of schools.

(2) Diffusion of Technical Education

At the time of appraisal, 4,900 students were expected to have technical education in the TTCs that this project would develop. After completion of the TTCs, 1,369 students (545 boys and 824 girls) participated in classes. The subjects for boys were electrical work, metal

processing, woodworking, and training for use of personal computers and for girls home economics, embroidery, cooking, and training for use of personal computers. The State of Education in Pakistan 2003-2004, an educational policy of the Pakistan government, included the introduction of technical subjects in higher secondary education and selected 1,100 model schools (including 110 schools in Balochistan). Technical subjects were compulsory for students who selected technical courses in these schools. The Balochistan provincial government provided technical education at higher secondary education in line with this national policy after 2006. At the time of the ex-post evaluation, no formal class is taught in the TTCs and, thus, the number of students for technical education has not reached its target.

(3) Securing Residence of Female Teachers

At the time of appraisal, this project aimed to ensure residence for 200 female teachers in 25 hostels. As mentioned in "3.2.1 Output", however, a policy to recruit teachers from the areas nearby the schools was implemented from 2,000, only one hostel for female teachers was constructed. At the time of the ex-post evaluation the one hostel for female teachers was not used and, thus, the number of users for hostels for female teachers does not achieve its target yet.

3.3.2 Qualitative Effects

At the ex-post evaluation, a questionnaire survey on the status of schools[10] was carried out for managers of the target schools. Out of 200 schools upgraded to middle schools, 58 schools (22 boys' school and 36 girls' schools) were selected in consideration of geographical access and other factors (58 valid responses). The samples contained schools in both the north and the south regions in a balanced manner because both regions differ in climate, ethnic groups, and culture.

(1) A Change in the Number of Students at the Target Schools

After the construction of schools and the provision of equipment, most respondents replied that the number of students "Increased", or "Somewhat Increased" and no one chose "Somewhat Decreased" or "Decreased" (see Table 5). The survey result showed that the beneficiary base was expanding. Better educational opportunities in the accessible area made more students attend schools.

[10] For the sake of fair assessment of effects and impact, the questionnaire survey was conducted across 58 schools upgraded to middle schools, nine schools where TTCs were constructed, and one school which administrated the hostel for female teachers.

Table 5: Change in Number of Students after Construction of School Buildings and Provision of Equipment

		Increased	Somewhat Increased	No Change	Somewhat Decreased	Decreased	No Answer	Total
How has the number of students changed after the improvement of school buildings and equipment?	Number of Respondents (persons)	48	5	1	0	0	4	58
	%	83%	9%	2%	0%	0%	7%	100%

Source: Results of questionnaire survey
Note 1: the question is addressed to all the target school and, thus, the number of students includes all students including those in lower secondary education.
Note 2: The sum of the percentages does not add up to 100 due to rounding.

(2) Change of Educational Environment

Approximately 30 percent of the schools responded that the number of classrooms was "Enough" for all students and slightly less than 70% of total respondents answered "Not Enough" or "Not at All" (see Table 6). Schools responding that the number of desks and chairs was "Enough" for all students accounted for slightly less than 30%, those that answered "Not Enough" surpassed 60%, and those that chose "Not at All" reached 10% (see Table 6). While an increase in the number of students in the target schools is desirable in terms of expanding the beneficiary base, the number of classrooms, desks, and chairs is considered insufficient. This project aimed to improve the educational environment by increasing the number of classrooms and suppling school furniture. However, the improvement of educational environment resulted in an increase in the number of students and the increase of classrooms and the further provision of school furniture is still needed at the time of the ex-post evaluation.

Table 6: Number of Classrooms and Number of Desks and Chairs

		Enough	Not Enough	Not at all	Total
Does your school have classrooms to accommodate all students?	Number of Respondents (persons)	19	36	3	58
	%	33%	62%	5%	100%
Does your school have enough desks and chairs for all students?	Number of Respondents (persons)	15	37	6	58
	%	26%	64%	10%	100%

Source: Results of questionnaire survey
Note: The question was addressed to the target schools and, thus, the number of students includes all students which includes those in lower secondary education.

3.4 Impacts

3.4.1 Intended Impacts

(1) Contribution to the Diffusion of Lower Secondary Education in the Balochistan province

The middle schools upgraded by this project accounted for slightly less than 40% of the total increase of middle schools in the Balochistan province over the FY1994/95 to FY2013/2002 period (see Table 7). In the same period, the middle schools upgraded by this project accounted for approximately 60% of the increase of boys' schools and approximately 30% of that of girls' schools. Moreover, the schools upgraded by this project are equivalent to about 20% of the increase in the number of schools to provide lower secondary education (the sum of middle and high schools). In the same period, the schools upgraded by this project are equivalent to 20% of the increase in boys' schools and 20% of girls' schools.

In FY 2013/14, the number of students for lower secondary education was 184,484 students (98,928 boys and 85,556 girls) in the Balochistan province and the number of students for lower secondary education had doubled between "before" and "after" the project implementation. The male-to-female ratio (at lower secondary education, the number of boys to the number of girls) was reduced from 3.9 times in FY 1994/95 to 1.2 times in FY 2013/2014. The number of students in the target schools of this project accounted for about 10% of the increase in the number of students for lower secondary education. The number of students in the schools upgraded by this project was equivalent to slightly less than 20% of the increase of boys and slightly less than 10% of girls at the corresponding education level. According to the executing agency, the percentage of students in the target schools of this project over total students was smaller than that of schools upgraded by this project over total schools since the project's emphasis on the improvement of access in rural areas resulted in fewer students per school for this project.

In the Balochistan province, the number of students in lower secondary education doubled from "before" to "after" project implementation and the male-to-female ratio became more balanced. Since about 20% of the schools providing lower secondary education and about 10% of the students benefitted from this project, it is inferred that this project contributed to the expansion of lower secondary education in Balochistan to some extent.

Table7: Contribution to Diffusion of Lower Secondary Education in the Balochistan Province

	Unit	FY 1994/95	FY 2013/14	Increase in province	Increase from this project	% of this project
Middle Schools	No. of Schools	623	1,165	542	200	37%
Boys' Schools	No. of Schools	531	670	139	80	58%
Girls' Schools	No. of Schools	92	495	403	120	30%
Middle Schools and High Schools	No. of Schools	984	1,948	964	200	21%
Boys' Schools	No. of Schools	827	1,220	393	80	20%
Girls' Schools	No. of Schools	157	728	571	120	21%
Number of Students in Lower Secondary Education	No. of Students	90,432	184,484	94,052	9,426	10%
Boys	No. of Students	72,089	98,928	26,839	4,513	17%
Girls	No. of Students	18,343	85,556	67,213	4,913	7%

Source: Questionnaire answers from Education Department, Government of Balochistan
Note: The percentage of this project shows the ratio of the increase from the project over the increase in the Balochistan province.

3.4.2 Other Impacts

(1) Diffusion of Higher Secondary Education

After the project implementation, some of the target schools under this project increased the number of classrooms and, then, these schools were upgraded to high schools[11]. Out of the 200 schools upgraded from primary schools to middle schools by the time of the ex-post evaluation, 31 schools were upgraded further to high schools. While the number of high schools in the Balochistan province was 361 schools (296 boys' schools and 65 girls' schools) in FY1994/95, the number increased to 783 schools (550 boys' schools and 233 girls' schools) in FY2013/14. The target schools under this project accounted for nearly 10% of the increase of high schools in the province. This result is also due to substantial efforts by the Balochistan government to expand higher secondary education but it is concluded that this project also contributed to the increase of high schools in the province to some extent.

(2) Impacts on the Natural Environment, Land Acquisition and Resettlement

According to the questionnaire answers from the executing agency, there was no negative impact on the natural environment and environmental permission was not required prior to the construction works. Since three or four classrooms were constructed for each primary school, the required areas were small and the new classrooms were built adjacent to the existing school buildings in most of the target schools. It is also unlikely that this project's small scale construction work negatively affected the natural environment. The land needed for the construction of schools was government-owned or donated from residents[12]. No

[11] The condition for upgrading to a high school includes the increase of classrooms to accommodate students at the ninth and the tenth grades.
[12] The lands were donated mostly from individuals and partly from communal lands administrated by residents.

information on the size of the land acquired by donation could be obtained. Based on the questionnaire answers from the executing agency and interviews with relevant personnel, resettlement was not required.

This project has to some extent achieved its objectives. Therefore effectiveness and impact of the project are fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

At the time of the ex-post evaluation, the executing agency Education Department, Government of Balochistan (hereinafter referred as "EDGOB") had ultimate responsibility for the facilities and equipment provided by this project. EDGOB has three divisions: Development (policy, planning, investment, etc.), Schools (human resource matters in schools), and General. The development division was engaged in management of the facilities and equipment. Each school carried out Operation & Maintenance (hereinafter referred to as "O&M") activities of the facilities and equipment and janitors directly conducted these activities under the supervision of a principal. Repair works of classrooms and school buildings which could not be implemented by schools were commissioned to external contractors.

From FY 2014/15, EDGOB has implemented a new scheme for procurement of equipment and teaching materials and regionally established cluster groups[13] in which high schools, middle schools, and primary schools have participated. The group consists of teachers, principals, and members of parent teacher school management committees. Principles who participate in the groups have undergone introductory procurement training conducted by EDGOB. On repair works of classrooms and school buildings, district governments decide on the requests from schools and the Communication and Works Department, Government of Balochistan procures the repair works.

Since 2011, the target schools have employed 792 staff (616 teachers and 176 other staff). In the questionnaire survey for the upgraded middle schools, 60% of respondents replied that the number of teachers "Increased" or "Somewhat Increased" (see Table 8). Thus, it is concluded that the number of teachers is growing.

[13] The cluster group consists of neighboring schools within the same district. A high school plays a leading role and primary and middle schools (10 schools or so) participate in the group.

Table 8: Number of Teachers after the Completion of the Project

	Increased	Somewhat Increased	No Change	Somewhat Decreased	Decreased	No Answer	Total
Number of Respondents (persons)	22	14	11	2	2	7	58
%	38%	24%	19%	3%	3%	12%	100%

Source: Results of questionnaire survey
Note: The sum of the percentages does not add up to 100 due to rounding.

The responsibility of O&M for the facilities and equipment is clearly defined and the number of teachers who play a vital role in sustaining the project effects in the education sector is increasing. Therefore, in terms of institutional aspects, no problems which could jeopardize sustainability was found.

3.5.2 Technical Aspects of Operation and Maintenance

The procurement of construction works and equipment has been procured domestically as planned. The procurement of school buildings was conducted by each school and that of materials and equipment was organized into several packages and Pakistan companies bid on these procurements. Routine maintenance of school buildings (cleaning, painting, minor repairs) conducted by janitors did not require special technical skills and maintenance manuals were not prepared for school buildings. Based on the questionnaire answers from EDGOB and interviews with the staff of the executing agency, spare parts and consumables for the equipment provided by the project were locally purchasable and the technological level of the equipment for science room and technical education was appropriate. At the time of the ex-post evaluation, usage and maintenance manuals for the science room equipment were made and these manuals were utilized for preparation of classes. Thus, it is considered that there were few technical difficulties in repair works of school buildings and use and maintenance of the equipment.

On the recruitment of teachers after FY 2014/15, external institutions have been assessing the abilities (subject knowledge, pedagogy, psychology, general knowledge) of applicants for teacher positions and after FY 2012/13, a degree in the educational field was a prerequisite for the recruitment of new teachers. On training of newly recruited teachers, there is a rule that all teachers must undergo training for school management. Furthermore, assessments to identify the training needs of each teacher was carried out every few years and training on topics such as school management, subject knowledge, and pedagogy was conducted in line with the same survey results. According to EDGOB staff, however, teachers with long professional experience tended not to actively participate in such training.

The interviews confirmed that routine maintenance of school buildings did not require special technical skills and that equipment with an appropriate technological level was

procured. Thus, in terms of technological aspects, problems which could jeopardize the sustainability of the project's effects were not found.

3.5.3 Financial Aspects of Operation and Maintenance

The budget expenditure for secondary education of the Balochistan province has increased more than the inflation rate since FY 2010/11 (see Table 9). In the current budget, the growth of both allocation and expenditure for staff salary was on the rise. Among the current budget items, expenditure of non-salary items including facility repair increased significantly in FY 2011/12 and has levelled off since then. According to EDGOB staff and a researcher in the institute to analyze the educational budget (Institute of Social Policy Science), the reason behind the flat expenditure of non-salary items is that the Communication and Works Department procured repair works and cumbersome procedures disenabled procurement within a fiscal year. The development budget which can be used for construction of school buildings increased significantly in FY 2013/14 and this suggested that the lack of classrooms, which was caused by the increase in the number of students, and large-scale repair would be addressed.

In FY2014/15, the budget allocation for secondary education was PKR 14,628 million (current budget PKR 10,703 million and development budget PKR 3,925 million) which was a 4% increase from FY 2013/14. The Balochistan government aimed at improving educational access and increasing the gross enrolment rate in lower secondary education in line with the Balochistan Education Sector Plan 2013-2018 and, therefore, the budget is expected to increase in the future. In addition, aid agencies are stepping up their support for the education sector in the Balochistan province. The Global Partnership for Education (GPE)[14] will provide USD 34 million to this sector by 2018 and the EU will provide EUR 30 million by 2020.

[14] GPE is an international organization to promote education in development countries to which Japan has also contributed capital.

Table 9: Budget for Secondary Education in the Balochistan Province

Unit: million PKR

	2010/11		2011/12		2012/13		2013/14	
	Allocation	**Expenditure**	**Allocation**	**Expenditure**	**Allocation**	**Expenditure**	**Allocation**	**Expenditure**
Budget for Secondary Education	6,345	6,487	9,345	9,869	7,094	11,670	14,113	17,093
Year on Year Change	—	—	47%	52%	-24%	18%	99%	46%
Current Budget	6,154	6,304	8,840	9,364	6,652	11,337	9,369	13,618
Year on Year Change	—	—	43.6%	48.6%	-24.7%	21.1%	40.8%	20.1%
Current Budget (Salary)	5,977	6,140	7,540	8,274	6,319	10,607	7,956	12,995
Year on Year Change	—	—	26%	35%	-16%	28%	26%	23%
Current Budget (Non-salary)	177	164	1,300	1,090	334	731	1,413	623
Year on Year Change	—	—	634%	566%	-74%	-33%	323%	-15%
Development Budget	191	183	505	505	442	333	4,744	3,475
Year on Year Change	—	—	164%	176%	-12%	-34%	973%	944%
Consumer Price Index		152.78		169.99		179.94		194.74
Year on Year Change		—		11%		6%		8%

Source: Institute of Social Policy Science (2014) "Public Finance of Education in Pakistan"
Note: The budget for secondary education is the sum of the current budget and the development budget.

The results of the questionnaire survey also confirm a similar tendency in the current budget of the upgraded middle schools (see Table 10). The schools which replied that staff salary "Increased" or "Somewhat Increased" for the past three years accounted for 96%. More than 80% of the schools replied "No" or "Not Frequently" for a delay in salary payment (see Table 11). As mentioned in "3.5.1 Institutional Aspects of Operation and Maintenance", the number of teachers increased in the target schools. Nevertheless, an increase of salary in the current budget did not cause a delay in salary payment and, thus, it is presumed that an adequate amount was allocated for salary. The budget allocation for non-salary items was PKR 725,000 (approximately JPY 880,000) per school in FY 2013/14 and PKR 507,000 (approximately JPY 620,000) per school in FY 2014/15 [15] and this budget amount is considered adequate for routine maintenance at the schools. The schools which answered "No Change" for maintenance budget in the past three years exceeded 80% and, as explained above, this result is likely to reflect unsmooth budget expenditure due to cumbersome procurement procedures.

[15] The amount is calculated by dividing the budget allocation by the number of schools providing secondary education (total of middle and high schools: 1,948 schools). The exchange rate is JPY 1.22/PKR at the end of May 2015.

Table 10: Budget in Target Schools for the Last Three Years

		Increased	Somewhat Increased	No Change	Somewhat Decreased	Decreased	No Answer	Total
Salary	Number of Respondents (persons)	26	24	8	0	0	0	58
	%	45%	41%	14%	0%	0%	0%	100%
Maintenance Budget	Number of Respondents (persons)	5	1	47	0	3	2	58
	%	9%	2%	81%	0%	5%	3%	100%

Source: Results of questionnaire survey

Table 11: Delay of Salary Payment (at the Ex-post Evaluation)

	Very Frequently	Frequently	Not Frequently	Never	Total
Number of Respondents (persons)	1	9	29	19	58
%	2%	16%	50%	33%	100%

Source: Results of questionnaire survey
Note: The sum of the percentages does not add up to 100 due to rounding.

The budget for secondary education is on the rise and salaries are also increasing without causing a delay in salary payments in more than 80% of the schools. Although the researcher and EDGOB staff pointed out a slower expenditure for repair works, the change of the development budget suggests that countermeasures for the lack of classrooms and large-scale repair have been enhanced. Thus, no problem which could jeopardize the sustainability of the project was found in terms of financial aspects.

3.5.4 Current Status of Operation and Maintenance

From the results of the questionnaire survey, all upgraded middle schools (58 schools) replied that they used school buildings constructed by this project every day. On damages to the facilities, some pointed out that windows and doors were broken (three schools) and paint had peeled off (one school). Some schools could not use water supply systems due to problems such as exhausted water sources and a broken pump (one school). Facilities for supplying electricity and toilets were quoted as insufficient items in their schools. Out of 42 schools which answered the question regarding the provided equipment, 26 schools replied that they used the science room equipment the most and 7 schools mentioned that they did not use the equipment. Reasons offered for not using the equipment included the lack of teachers in charge, equipment broken by flood, and obsolete equipment.

For O&M of the TTCs, no teacher was assigned and no formal class was conducted because budget was not allocated for the TTCs at the time of the ex-post evaluation. Nevertheless, out of nine schools which participated in and replied to the survey, eight

schools used the constructed school buildings due to the lack of classrooms. The equipment for home economics, cooking, sewing/embroidery, electrical works, metal processing and wood works were not used but some schools still used equipment with a variety of use such as personal computers at the time of ex-post evaluation. Regarding the hostel for female teachers, the building was not used at the time of the ex-post evaluation and sanitary facilities such as toilets were damaged and in need of repair.

Some school buildings and equipment in the earlier phase of the project were constructed or placed in the first half of the 2000s and showed aging and obsoleteness but the school buildings and most of the equipment in demand were presumably in usable conditions.

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to increase the number of children enrolled in lower secondary education in the target schools and widen the coverage of technical education by constructing middle schools and Technical Trade Centers and by training teachers, thereby contributing to equal educational opportunity for boys and girls in the Province of Balochistan.

At the time of both the appraisal and the ex-post evaluation, the Pakistan government regarded reducing educational disparity as one of its important policy goals. Solving a bottleneck in lower secondary education and improving access to education for girls was needed particularly in the Province of Balochistan. The relevance of this project is high as this project has been highly relevant to the country's educational policy and development needs, as well as Japan's ODA policy. While the project cost of this project decreased due to the depreciation of the local currency against the yen, the completion of the project was delayed significantly because of delays in the procurement process and a longer construction period. Based on the above, efficiency of the project is fair. At the time of ex-post evaluation, this project upgraded 200 target schools (80 boys' schools and 120 girls' schools) to middle schools and the number of students in these schools achieved approximately 80% of the target. While the number of male students reached approximately 60% of the target, the number of female students was almost as planned. Out of an increase in the number of schools providing lower secondary education in the period "before" and "after" project implementation, schools upgraded by this project accounted for approximately 20% in the province. An increase in the number of students in lower secondary education in the project's target schools accounted for 10% of that in the province for the same period. On the other hand, due to a policy change in the Balochistan government, technical education was conducted in higher secondary education. Formal technical education was not carried out in the target schools. Thus, effectiveness and impact of

the project are fair. On sustainability of this project, operation and maintenance responsibilities for facilities and equipment were clearly defined. The technical level was appropriate for the construction of facilities and the provision of equipment. Budget for secondary education had been increasing. As no major problem was found in intuitional, technical, and financial aspects, the sustainability of effects induced by this project is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) To Widen the Role of the Cluster Groups

Procurement of repair works takes a long period and, therefore, the schools tend to ignore minor damages on the infrastructure and wait for large-scale repair works. Repair works of school buildings needs to be made through the Communication and Works Department and the department is required to assess the current situation of facilities, define the scope of repair works, and prepare cost estimates. As the cumbersome procedures do not allow timely implementation of repair works, preventive maintenance to reduce life cycle cost is not conducted. For long-term sustainability after project completion, adequate budget allocation and its efficient use should be encouraged. It is desirable for EDGOB to widen the role of the cluster groups to include not only procurement of teaching materials and goods but also planning and procurement of repairs and services. The training on procurement for head teachers in the groups should be continued. Advanced training courses on procurement and financial management for head teachers should be introduced.

(2) To Prepare a Maintenance Manual for School Buildings

Preventive maintenance requires a maintenance manual to establish inspection points of building, assessment standards, and a checklist but such a manual had not been prepared by the time of the ex-post evaluation. As mentioned above, school managers tend to disregard minor damages on infrastructure and wait for major repairs. One reason for this is that no maintenance manual has been prepared for buildings. It is desirable for EDGOB to prepare a maintenance manual on buildings which can be used easily by members of cluster groups. The preparation of a manual would help cluster groups plan maintenance, implement preventive measures and presumably contribute to the efficient use of maintenance budgets in conjunction with the wider role of the cluster group in procurement of building repairs.

(3) To Organize Training Cluster for Teachers

Proper teacher trainings need to be carried out to ensure effectiveness in imparting knowledge to the students. Nevertheless, some teachers with long working experience do not actively participate in the in-service training provided. Efforts should be made to motivate

teachers for self-improvement after their recruitment but such efforts have not been implemented yet in the Balochistan province. On the other hand, training clusters for teachers were regionally formed in the Punjab province and this arrangement created an environment in which teachers stimulate each other. In this scheme, mentors are assigned to the clusters and they assess the ability of participating teachers, and play an advisory role for the improvement of teachers' abilities. It is desirable for EGDOB to organize similar training clusters for teachers in the Balochistan province, stimulate motivation for self-improvement, and assess and enhance teachers' capacity.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

(1) Assessing a Component to Enhance Monitoring Capacity.

This project carried out the construction and repair of school buildings and the provision of furniture and equipment in more than 200 schools in the vast areas of Balochistan province. At the time of appraisal, however, assessment of the monitoring scheme did not focus on an appropriate organizational set-up for the monitoring, selection of indicators, and frequency of data collection. This project monitored only progress of outputs and rarely assessed project effects during the project implementation stage. For the improvement of project effects, it is desirable to track project effects and feed the results back to the project during the project implementation. There was significant room for improving the monitoring scheme. Although a school database[16] was under operation in the Balochistan province at the time of appraisal, it was difficult to identify target schools and collect essential data (i.e. location, timing of assistance, number of students and teachers) after the project completion. For an education project to support target schools over a wide area, it is desirable to assess the executing agency's monitoring scheme at appraisal for a smoother PDCA cycle and, if necessary, add a component to the project's scope to enhance their monitoring capacity (such as implementation of a data base and operational support).

(2) To Assess Stepwise Project Implementation

Due to the lack of teachers and equipment, technical education in the Balochistan province had been suspended for five years prior to the appraisal. Upon the reintroduction of technical education, it was necessary to implement the project and simultaneously assess the implementation capacity of the executing agency. In considering the project's sustainability at the time of appraisal, therefore, it was decided to divide implementation of technical education

[16] The database in the Balochistan contains individual school data including the number of students and teachers and the status of facilities such as school yard and libraries.

component into three phases and make a stop-or-go decision by assessing the performance after each phase. Assistance for technical education was carried out only in the phase one because during project implementation it was confirmed that a sufficient budget for technical education was not available. For a project which develops infrastructure in multiple sites, in order to identify a sustainable project scope it is desirable to assess the current budget allocation and, if the current budget allocation is difficult to predict in the long run, it is desirable to examine a stepwise project implementation at the time of appraisal.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	(1) Expansion of Secondary Education: Construction of class rooms and furniture & equipment for upgrading to middle schools (200 schools, 80 boys' and 120 girls' schools) (2) Diffusion of Technical Education: Construction of TTCs in middle schools and provision of equipment (52 schools, 39 boys' and 13 girls' schools), Training of 208 teachers (3) Improvement of Primary and Middle Schools: Repair of buildings, furniture & equipment for schools under the components (1) and (2) above (252 schools) (4) Hostels for Female Teachers: Construction of Hostels for female teachers (25 hostels), furniture & equipment (5) Consulting Service International: 30 M/M National: 120 M/M	(1) Expansion of Secondary Education: Same as left (2) Diffusion of Technical Education: Construction of TTCs in middle schools and provision of equipment (10 schools, 6 boys' and 4 girls' schools), Training of 40 teachers (3) Improvement of Primary and Middle Schools: Repair of buildings, furniture & equipment for schools under the components (1) and (2) above (210 schools) (4) Hostels for Female Teachers: Construction of Hostels for female teachers (1 hostels), furniture & equipment (5) Consulting Service International: 30 M/M National: 324 M/M
2. Project Period	March 1997 – December 2002 (70 months)	March 1997 – February 2011 (168 months)
3. Project Cost		
Amount paid in Foreign currency	412 million yen	174 million yen
Amount paid in Local currency	4,230million yen (1,400 million PKR)	3,542million yen (1,807 million PKR)
Total	4,632million yen	3,716 million yen
Japanese ODA loan portion	3,917million yen	1,510 million yen
Exchange rate	1 PKR = JPY 3.02 (As of December 1995)	1 PKR = JPY 1.96 (Average between January 1997 and December 2010)