Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Mongolia

Project: Higher Engineering Education Development Project

Loan Agreement: March 12, 2014

Loan Amount: 7.535 billion

Borrower: The Government of Mongolia

2. Background and Necessity of the Project

(1) Current State of and Issues for Higher Education Sector Development in Mongolia

Mongolia has achieved significant economic growth led by the development of mineral resources, and achieved extremely high real GDP growth rates of 17.5% in 2011 and 12.3% in 2012[1]. In line with this, the need to cultivate industrial human resources has increased, and the higher education sector has been expanding rapidly. Enrollment in institutions of higher education over the five years between 2007 and 2012 has increased by approximately 22%. Enrollment in engineering faculties in particular has increased by approximately 38%[2], which indicates high growth.

Meanwhile, improvement in the quality of education has not kept pace with the rapid growth in this sector. As a result, the ratio of teachers at institutes of higher education for engineering with doctoral programs has remained at 24%[3], which is significantly lower than in Japan and other advanced countries with ratios of 100%[4]. In addition, the number of teachers for the number of students enrolled is insufficient. For example, the number of students per teacher at the Mongolian University of Science and Technology is 27.1[5] (OECD average: 15.7, Japan average: 11.5[6]), indicating that the cultivation of teachers is also a serious issue in Mongolia. Furthermore, many students at institutes of higher education are enrolled in departments related to social science and business, while the number of students enrolled in areas of science and engineering that most industries have increasing need for has remained at 23% of the entire student population due to the lower capacity of engineering departments in Mongolia.

According to a survey of companies on the need for human resources in engineering[7], university graduates in Mongolia lack applied technology (34%), judgment (23%), ambition (19%), and basic engineering knowledge (17%). An important point in the results of the survey is insufficiency in both applied technology and basic engineering knowledge, which shows that higher education for

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[1] National Statistical Office of Mongolia
[2] Statistical Year Book Education, Culture, Science and Technology (2011-2012)
[3] Statistical Year Book Education, Culture, Science and Technology (2011-2012)
[4] "Science and Technology Survey", the Ministry of Internal Affairs and Communications, 2011
[5] International Comparison of Education Indicators 2012 by the Ministry of Education, Culture, Sports, Science and Technology
[6] International Comparison of Education Indicators 2012 by the Ministry of Education, Culture, Sports, Science and Technology
[7] The survey on the need for human resources in engineering included a preparatory survey of 113 companies randomly selected from the top 20 companies in 13 major industries in Mongolia by questionnaire or hearing. A total of 93 valid responses were collected. Major questionnaire items included the following three: 1. Need for human resources in engineering; 2. General evaluation for human resources in engineering (insufficiency); and 3. Requests to domestic universities for the cultivation of human resources in engineering

engineering is failing to meet the needs of industry. The results are supported by the fact that the rate of new recruitment toward new job openings remained at 19.7% in the construction and manufacturing industries while the ratio of university graduates toward the entire number of unemployed individuals was high at approximately 26%[8] in 2011. In order to satisfy the needs of the industries that have supported continuous economic growth in Mongolia, there is an urgent need to cultivate human resources in engineering.

(2) Development Policies for the Higher Education Sector in Mongolia and the Priority of the Project

The new administration in Mongolia that took office following elections in June 2012 announced a Government Action Plan (2012–2016) that includes many plans for national development projects such as the development of mines, mineral resources, and infrastructure, as well as policy objectives such as the development of domestic industries, self-sufficiency concerning food, the realization of transparent and fair administration, and the need for the cultivation of human resources for such development. The "Qualitative Reform Program in Education and Science," which is a priority measure of the Ministry of Education and Science of Mongolia, refers to the reform of engineering education and the enhancement of links between university education and labor market needs. This project contributes to the cultivation of human resources required to promote the Mongolian Government Action Plan, enhancement of higher education through the improvement of facilities as bases for engineering education in Mongolia, and the reduction of mismatch between higher education and the labor market.

(3) Japan and JICA Policy and Operations in the Higher Education Sector

The JICA Country Analysis Paper for Mongolia created in May 2012 set three major priority areas: 1. Sustainable development in the mineral resource sector and stronger governance; 2. Support for inclusive growth; and 3. Strengthened urban functionality in Ulan Bator. This project is designed to cultivate human resources for problem solving in these three major priority areas. The Mid-term Action Plan, which was announced during the top-level meeting between Mongolian Prime Minister Norov Altankhuyag and Japanese Prime Minister Shinzo Abe in September 2013, referred to Japan's cooperation in the enhancement of the functions of institutions of higher education for engineering and the cultivation of human resources for Mongolian industries through programs for learning in Japan. JICA has been engaged in improving the learning environment through the building of facilities and provision of equipment in the form of grand aid, and the improvement of teacher abilities through technical cooperation. In the field of humanity, JICA has been providing free grants for the cultivation of human resources targeting administrative officers.

(4) Other Donors' Activity

The Asian Development Bank (ADB) implemented its Higher Education Reform Project from September 2011 (loan project) focusing on surveys, advice, and training for the purpose of improving the quality of programs for higher education. In addition, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) provided support in the establishment of the Mongolia-Germany Institute of Technology (technical cooperation) for the cultivation of human resources in mining.

(5) Necessity of the Project

[8] Capability Supply Landscape Study – Mongolia, American University of Mongolia, October 2012

As noted above, it is necessary to improve the environment for the cultivation of human resources in engineering in Mongolia through the enhancement of higher education in engineering and research capabilities in Mongolia. This project figures prominently in Mongolia's development policy, and is consistent with Japan and JICA aid policies. Accordingly, both the need for and relevance of JICA support for the implementation of this project are high.

3. Project Description

(1) Project Objective

This project aims to cultivate human resources in engineering for Mongolia through the enhancement of institutions of engineering education (cultivation of teachers, improvement of curriculum, equipment improvement, etc.) and to provide opportunities for learning in Japan. This would contribute to the stable growth of Mongolia's economy through the development and enhancement of the nation's industries.

(2) Project Site/Target Area

Mongolia and Japan

(3) Project Components

1) International joint education program (faculty twinning, joint curriculum development)
2) Teaching staff cultivation program (overseas education: doctoral and master programs)
3) Improvement of equipment for research and education
4) Joint research between universities in both Japan and Mongolia
5) Overseas education program for technical colleges
6) Project Development Support Services (PDSS) (detailed designing, implementation management, etc.)

(4) Estimated Project Cost

8.15 billion (Loan amount: 7.535 billion)

(5) Schedule

From March 2014 to March 2023 (total: 109 months). Project completion is defined as the completion of the final disbursement.

(6) Project Implementation Structure

1) Borrower: The Government of Mongolia
2) Executing Agency: The Ministry of Education and Science
3) Operation and Maintenance System: Steering committees, working groups, etc. will be established to operate and manage the work under the jurisdiction of the Ministry of Education and Science.

(7) Environmental and Social Consideration/Poverty Reduction/Social Development

1) Environmental and Social Consideration

(i) Category: C

(ii) Reason for Categorization:

As described in the JICA Guidelines for Environmental and Social Considerations (issued in April 2010), negative impact of this project on the environment would not be significant.

2) Promotion of Poverty Reduction: None

3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Disease including HIV/AIDS, Participatory Development, Considerations for Persons with Disabilities, etc.): None

(8) Collaboration with Other Donors:

As is described in 2 (4), ADB and other donors are engaged in activities in the higher education sector and vocational technical education training sector. JICA will promote collaboration with these donors, including the prevention of overlap in target fields.

(9) Other Important Issues: None

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicators	Baseline (Actual Value in 2013)	Target (2025) (Expected value 2 years after project completion)
Number of improvement programs and curricula	–	30
Degree recipient rate (%)	–	85
Rate of teachers at engineering faculties that hold doctorates (%) (National University of Mongolia/ Mongolian University of Science and Technology)	59/34	75
Number of students per teacher (National University of Mongolia/ Mongolian University of Science and Technology)	29.7/27.1	15.00
Employment rate at domestic companies in Mongolia (including foreign-affiliated companies) (%)	–	70
Number of students from overseas in twinning programs	–	320
Number of students from overseas in master's, doctoral, and technical college programs	–	100/60/200
Number of theses accepted by international academic journals (National University of Mongolia/ Mongolian University of Science and Technology)	234/152	460/300

*To check the operation and effects of this project, the baseline (before the implementation of this project) of the improvement programs and number of students are set as zero; therefore, those baseline figures are indicated as "-."

2) Internal Rate of Return:

Not calculated due to the difficulty of calculating profitability in educational projects

(2) Qualitative Effects

Improvement of quality of higher education in engineering in Mongolia/ Nurturing human resources engaged in engineering satisfying the needs of industry in Mongolia

5. External Factors and Risk Control

An external factor is the non alteration of government policies prioritizing the cultivation of human resources in engineering, including the Mongolian Government Action Plan (2012–2016). In order to ensure fairness and transparency, individuals from the Japan side should participate in the steering committee to select international students.

6. Lessons Learned from Past Projects

During the ex-post evaluation for the Higher Education Loan Fund Project (HELP) carried out in Malaysia, not only the provision of scholarships, but also information sharing among implementation organizations and universities through consultants, and detailed monitoring promoted smooth operation according to plans. It is suggested that such consulting services be included to support similar projects.

Based on the above lessons learned, in this project, JICA will hold seminars and joint committee meetings to promote collaboration and information sharing among concerned government ministries and agencies and universities, and provide consulting personnel for program development support services such as the improvement of curriculum for twinning programs and liaison and coordination among universities in Japan and Mongolia.

7. Plan for Future Evaluation

(1) Indicators to be Used in Future Evaluations

1) Number of improvement programs and curricula
2) Degree recipient rate (%)
3) Rate of teachers at engineering faculties that hold doctorates (%)
4) Number of students per teacher
5) Employment rate at domestic companies in Mongolia (including foreign-affiliated companies) (%)
6) Number of students from overseas in twinning programs
7) Number of students from overseas in master's, doctoral, and technical college programs
8) Number of theses accepted by international academic journals

(2) Timing for Next Evaluation

Two years after project completion