

**Ex-Post Monitoring Report of Japanese ODA
Loan Projects 2008
(Indonesia, Malaysia,
Uzbekistan, Kazakhstan)**

February 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

OPMAC Corporation

Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, external evaluations conducted by experts shall be enhanced.

This volume shows the results of the ex-post monitoring for 4 Japanese ODA loan projects that were mainly completed seven years ago and were given ex-post evaluation five years ago. The ex-post monitoring was entrusted to external evaluators to review the projects' effectiveness, impact, and sustainability, to follow up the recommendations made in the ex-post evaluation, and to make further recommendations for future sustainability.

The lessons and recommendations drawn from these monitoring will be shared with JICA's stakeholders in order to apply to the planning and implementation of similar projects in the future.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

February 2010

Atsuo KURODA

Vice President

Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA.

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Table of Contents

Preface.....	i
Disclaimer	ii
Table of Contents	iii
Indonesia, “The Bepedal Regional Monitoring Capacity Development Project”	1-1
1. Project Description.....	1-1
1.1 Project Objective.....	1-1
1.2 Outline of the Loan Agreement.....	1-1
1.3 Background of Ex-post Monitoring	1-1
2. Monitoring Results.....	1-2
2.1 Effectiveness (Impact).....	1-2
2.1.1 Quantitative Effects.....	1-2
2.1.2 Qualitative Effects.....	1-5
2.1.3 Impact.....	1-6
2.2 Sustainability.....	1-8
2.2.1 Operation and Maintenance Agency	1-8
2.2.1.1 Structural Aspects of Operation and Maintenance	1-8
2.2.1.2 Technical Aspects of Operation and Maintenance	1-9
2.2.1.3 Financial Aspects of Operation and Maintenance	1-10
2.2.2 Current Status of Operation and Maintenance	1-10
3. Conclusion, Lessons Learned and Recommendations	1-10
3.1 Conclusion.....	1-10
3.2 Lessons Learned.....	1-11
3.3 Recommendations	1-11
Comparison of Original and Actual Scope.....	1-12
Malaysia, “Rehabilitation of the Tenom Pangi Hydropower Project”	2-1
1. Project Description.....	2-1
1.1 Project Objective.....	2-1
1.2 Outline of the Loan Agreement.....	2-1
1.3 Background of Ex-post Monitoring	2-1
2. Monitoring Results.....	2-2
2.1 Effectiveness (Impact).....	2-2
2.1.1 Quantitative Effects.....	2-2
2.1.2 Impact.....	2-5

2.2 Sustainability	2-7
2.2.1 Operation and Maintenance Agency	2-7
2.2.1.1 Structural Aspects of Operation and Maintenance	2-7
2.2.1.2 Technical Aspects of Operation and Maintenance	2-8
2.2.1.3 Financial Aspects of Operation and Maintenance	2-8
2.2.2 Current Status of Operation and Maintenance	2-8
3. Conclusion, Lessons Learned and Recommendations	2-10
3.1 Conclusion.....	2-10
3.2 Lessons Learned.....	2-11
3.3 Recommendations	2-11
Comparison of Original and Actual Scope.....	2-12
Uzbekistan, “Three Local Airports Modernization Project (1) (2)”	3-1
1. Project Description.....	3-1
1.1 Project Objective.....	3-1
1.2 Outline of the Loan Agreement	3-1
1.3 Background of Ex-post Monitoring	3-2
2. Monitoring Results.....	3-2
2.1 Effectiveness (Impact).....	3-2
2.1.1 Quantitative Effects (Current Facilities Operating Conditions and Effectiveness).....	3-2
2.1.2 Qualitative Effects	3-6
2.1.3 Impact.....	3-9
2.1.3.1 Attainment of Project Goals	3-9
2.1.3.2 Environmental and Social Impact	3-11
2.1.3.3 Other Impacts	3-11
2.2 Sustainability	3-12
2.2.1 Operation and Maintenance Agency	3-12
2.2.1.1 Structural aspects of Operation and Maintenance	3-12
2.2.1.2 Technical aspects of Operation and Maintenance	3-13
2.2.1.3 Financial aspects of operation and Maintenance.....	3-13
2.2.2 Current status of Operation and Maintenance	3-14
3. Conclusion, Lessons Learned and Recommendations	3-14
3.1 Conclusion.....	3-14
3.2 Lessons Learned.....	3-14
3.3 Recommendations	3-15
Comparison of Original and Actual Scope.....	3-16

Kazakhstan, “Railway Transport Capacity Development Project”	4-1
1. Project Description.....	4-1
1.1 Project Objective.....	4-1
1.2 Outline of the Loan Agreement.....	4-1
1.3 Background of Ex-post Monitoring	4-2
2. Monitoring Results.....	4-2
2.1 Effectiveness (Impact).....	4-2
2.1.1 Current Facilities Operating Conditions and Effectiveness	4-2
2.1.2 Results of Economic Internal Rate of Return.....	4-8
2.1.3 Impact.....	4-8
2.2 Sustainability.....	4-10
2.2.1 Operation and Maintenance Agency	4-11
2.2.1.1 Structural aspects of Operation and Maintenance	4-11
2.2.1.2 Technical aspects of Operation and Maintenance	4-11
2.2.1.3 Financial aspects of Operation and Maintenance.....	4-12
2.2.2 Current status of Operation and Maintenance	4-13
3. Conclusion, Lessons Learned and Recommendations	4-14
3.1 Conclusion.....	4-14
3.2 Lessons Learned.....	4-14
3.3 Recommendations	4-15
Comparison of Original and Actual Scope.....	4-16

Indonesia

Ex-post Monitoring of Completed ODA Loan Project
 “The Bepedal Regional Monitoring Capacity Development Project”

External Evaluator: Nobuyuki Kobayashi
 (OPMAC Corporation)
 Field Survey: August 2009

1. Project Description



Map of the project area



Equipment procured by this project

1.1 Project Objective

The objective of this project is to improve the capacity for collection and analysis of environmental data (water/air pollution, etc.), which forms the basis for the development of monitoring programs, by developing the capabilities of regional laboratories (research institutes), thereby contributing to improvements in Indonesia's environment through improving the efficiency of environmental administration.

1.2 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	2935 million yen / 2743 million yen
Loan Agreement Signing Date/ Final Disbursement Date	November 1994 / December 2001
Ex-post Evaluation	FY 2003
Executing Agency	Environmental Impact Management Agency (BAPEDAL) (at the time of appraisal)
Main Contract	Itochu Corporation (Japan)
Main Consultant	Nihon Suido Consultants (Japan)

1.3 Background of Ex-post Monitoring

As rapid population and economic growth accelerated environmental degradation in

Indonesia, the establishment of a nation-wide network for environmental monitoring became an urgent task. At the time of appraisal (1994) however, there were few laboratories which owned the appropriate equipment for testing besides in Jakarta and, thus, environmental data was neither sufficient in quantity nor quality. In order to cope with this problem, this project provided regional laboratories with the equipment for environmental monitoring. The ex-post evaluation confirmed that the equipment was utilized to some extent but it also revealed that there had been no clear program for the utilization of the regional laboratories assisted by this project following the resignation of President Suharto in 1998. The laboratories were merely measuring and providing data in response to client requests. Decentralization altered the institutional arrangements for the operation and maintenance of this project. The ownership of the procured equipment was to be transferred to provincial governments while the location of the equipment was to be changed to provincial environmental departments. Because of this, at the time of the ex-post evaluation, careful monitoring was required as to how decentralization would affect the sustainability of the project effects. Therefore, this project was selected for ex-post monitoring and reviewed under each criterion with the findings from the field survey and other research activities with a final conclusion being drawn.

2. Monitoring Results

2.1 Effectiveness (Impact)

There was no significant change in effectiveness from the ex-post evaluation (2003) to the ex-post monitoring (2009). Among the laboratories with equipment procured by this project, the number of testing samples has stayed at the same level as at the ex-post evaluation and the number of laboratories accredited ISO17025 remains the same.¹ As equipment little used for testing tends not to be repaired after machine trouble, their use has become less frequent than at the time of the ex-post evaluation. Although the target laboratories play a similar role in the environmental monitoring, there are several new cases (the contribution to the reduction of pollutant, the enhancement of environmental monitoring capacity in Kota/Kabupaten governments, and the enforcement of environmental regulations) which contribute to realizing the desired project effects.

2.1.1 Quantitative Effects

(1) Usage of the procured equipment

Out of the laboratories with equipment procured by this project, 10 laboratories were visited during the field survey when interviews about the current status of equipment usage took place. For comparison with past data, the laboratories which were inspected in the ex-post evaluation were revisited. These were:

¹ ISO17025 is for testing or calibration organizations and accredits a certain type of material testing or that of the calibration of meters.

- North Sumatra province : BLH (provincial government)
- West Jawa province : BBPK (Ministry of Industry: MOI), BPLK (provincial government), BPMKL (provincial government)
- East Jawa province : Baristand (MOI), BBTKL (Ministry of Health: MOH), BLH (provincial government)
- South Kalimantan province: Baristand (MOI), BLK (provincial government), Dinas PU (provincial government)

*Ministries and local governments with which the laboratories are affiliated are in parentheses.

Amongst the equipment for water quality monitoring, UV-VIS and *Atomic* Absorption Spectrophotometers (AAS) are widely used for water testing by private companies and local government and their use is very frequent (see Table 1 and Table 2). On the other hand, the uses of Gas Chromatography (GC) and Total Organic Carbon Meters (TOC) are less frequent than it was at the time of the ex-post evaluation. For most of the target laboratories, the main purpose of the equipment is to meet testing requests from clients. The small number of clients with testing needs results in the infrequent use of equipment. There are very few clients which require testing using TOC. Except for residual pesticide, testing with GC is also very limited.

Table 1: Use of procured equipment at the time of ex-post evaluation
(for the previous 6 months)

Equipment	N	Used	Not used	Unknown
UV-VIS	18	13	0	5
AAS	18	11	0	7
GC	15	11	1	3
TOC	18	11	2	5
Air pollution observation vehicle	10	1	4	5

Source: Data collected for the ex-post evaluation on The Bepedal Regional Monitoring Capacity Development Project

Table 2: Table 2 Use of procured equipment at the time of the ex-post monitoring
(Used/Not Used for the previous 6 months)²

Equipment	N	Used	Not used
UV-VIS	10	10	0
AAS	10	9	1
GC	7	2	5
TOC	10	4	6
Portable multi gas analyzer	4	3	1
Air pollution observation vehicle	4	1	3

Source : Interviews at the 10 laboratories visited during the field survey

² The ex-post evaluation report did not mention the use of portable multi gas analyzers. In consideration of its importance in air quality testing, the use of the equipment was assessed in this ex-post monitoring.

Photo 1: UV-VIS



Photo 2: *Atomic* Absorption Spectrophotometer (AAS)



Photo 3: GC



Photo 4: Total Organic Carbon Meter (TOC)



Among the equipment for air quality monitoring, the portable multi gas analyzers are used for the testing of smoke-stacks at factories and that of ambient air (see Table 1 and Table 2). The laboratories under MOI have clients who require the testing of smoke-stacks. The laboratories which indicated that they do not use the portable multi gas analyzer quoted malfunction as the reason of nonuse. As for Air pollution observation vehicles, out of four laboratories visited during the field survey, three laboratories had experienced problems at the time of procurement (the controlling PC could not be connected to meters, etc.). In the case that the vehicles were used, equipment was removed from the vehicle and used inside the laboratory.

Photo 5: Portable multi gas analyzer



Photo 6: Air pollution observation vehicle



(2) Number of Monitoring Samples

In order to obtain information on the usage of equipment, a questionnaire survey with the laboratories was carried out for the ex-post monitoring. Using the latest information, questionnaires were sent out to 39 laboratories in 14 provinces which own or received the procured equipment. Questionnaires were returned from 24 laboratories, 20 laboratories of which still owned the equipment at the time of the ex-post monitoring. 10 laboratories answered on the numbers for water testing, 6 laboratories on stack testing, and 4 laboratories on ambient air testing.

The change in the number of testing samples in comparison with data at the time of the ex-post evaluation is shown below (see Table 3). A majority of the laboratories replied that there was no change in the numbers for testing of water, stacks, or ambient air.

Table 3: Change in testing samples
(comparison with the time of the ex-post evaluation 2003)

	Increase	No Change	Decrease	Total
Water	3	5	2	10
Stacks	2	4	0	6
Ambient Air	1	3	0	4

Source: Questionnaire with target laboratories

(3) ISO 17025 accredited laboratories

According to the database of the Indonesian national standards organization Badan Standardisasi Nasional (BSN), among those with the procured equipment, 10 laboratories had ISO17025 in 2008. At the time of the ex-post evaluation, out of those with the equipment, 10 laboratories had ISO17025. After April 2009, MOE Regulation No.6 of 2009 requires accredited environmental laboratories (which are allowed to test data to be submitted to national and regional laboratories) to have ISO17025. Because of this new regulation, all of the 10 laboratories visited during the field survey had obtained or were applying for ISO17025. As the preparation of Standard Operational Procedures (SOP) is required for ISO17025 accreditation, most of the visited laboratories had SOP.

2.1.2 Qualitative Effects

(1) Factors affecting the use of equipment

Focus group discussions (FGD) were carried out at BBTKL³, which belongs to MOH, in order to obtain views on the factors that affect the effective use of equipment. Two FGD sessions were conducted: one for administration staff and another for testing staff. In the FGD, the most common reason given for the effective use of equipment among the administrative

³ As BBTKL scored highly in the *Special Assistance for Project Sustainability for the Bapedal Regional Monitoring Capacity Development Project* funded by the Japan Bank for International Cooperation, and it was chosen as a laboratory which uses the equipment effectively.

staff was that the equipment satisfied the needs of BBTKL (see Box 1). Similarly, testing staff were of the opinion that the procured equipment complemented the existing equipment and had a high utility, in addition to this, the improvement in testing skills contributed to the better use of equipment. Those who use the equipment perceived that not only capability in the use and maintenance of the equipment but also the assessment of equipment needs plays a vital role in the effective use of the equipment.

Box 1: Focus Group Discussion (No.1)			
Date		: August 11, 2009	
Location		: BBTKL (affiliated with Ministry of Health), Surabaya, East Jawa province	
Discussion Theme		: "Why does BBTKL effectively utilize the equipment?"	
Participants		: BBTKL testing staff (11 participants) and administrative staff (8 participants)	
After discussion, participants were asked to cast votes (up to three votes per person) on the reasons for why they agreed about effective equipment use. The results were as follows:			
Testing staff	# of votes	Administrative Staff	# of votes
Operators' competence is satisfactory due to training	10	Equipment fulfilled the needs of the laboratory	10
New equipment complements existing equipment	8	Laboratory is a accredited environmental laboratory	8
Routine maintenance	5	State of the art equipment	6
Improvement of the accuracy of analysis results	3		
Fast and simple methods for analysis	3		
More testing parameters	2		
Improvement of analysis methods	2		

2.1.3 Impact

(1) Contribution to regional environmental monitoring systems

The target laboratories play a similar role in environmental monitoring as they did at the time of the ex-post evaluation. The laboratories test and provide samples upon request from clients (provincial governments, Kota/Kabupaten governments, and private companies). However, there are several new cases contributing to the realization of project effects other than testing for clients.

1) Efforts to reduce pollutant

FGD were carried out at BBPK, which belongs to MOI, in order to obtain views on the effectiveness of equipment use (see Box 2). Unlike other laboratories, BBPK also place an emphasis in independent research and the consulting services to companies. BBPK does not only test samples from clients but also contributes to the reduction of pollutants at client companies via research and consulting. The procured equipment is utilized for the research and consulting activities of BBPK.

Box 2: Focus Group Discussion (No.2)

Date : August 7, 2009

Location : BBPK (affiliated with the Ministry of Industry), Bandung, West Jawa province

Discussion Theme : "How does BBPK contribute to the protection of the environment?"

Participants : BBPK research staff (8 participants) and testing staff (10 participants)

Figures next to opinions are the number of participants' votes. After discussion, participants were asked to cast votes (up to three votes per person) on the reasons for why they agreed about effective equipment use.

Research staff	# of votes	Testing staff	# of votes
More efficiency in waste processing (less pollutants)	6	Conducting analysis of various kinds of industrial waste	15
More recycling	6	Consultation with companies	6
Training for companies	4	Conducting research for environmental protection	5
Monitoring of waste	2		
Design of the processing system for liquid waste	2		
Improvement of score in environmental assessment	2		
Dissemination of research results	2		

2) Review of environmental data from Kabupaten /Kota governments and training

Under the environmental monitoring scheme in Indonesia, Kota/Kabupaten governments inspect river water quality in their assigned areas. Meanwhile, provincial governments put together data from the Kota/Kabupaten governments and collect data in their assigned river sections. Among the laboratories visited during the field survey, the procured equipment was transferred to the laboratories under the provincial environmental departments in North Sumatra and East Jawa provinces. According to interviews at the laboratories, the provincial governments checked water quality data from the Kota/Kabupaten governments with the data being tested using the procured equipment. In North Sumatra province, the Kota/Kabupaten governments purchased new equipment with the support of the special national account for the environment (DAK) but the number of staff who can use this new equipment is limited. The laboratory under the provincial department of the environment provides training to the Kota/Kabupaten governments using the equipment procured by this project.

3) Contribution to compliance with environmental regulations

For the 10 laboratories visited during the field survey, the department of environment in East Jawa province routinely conducts forced inspections jointly with the police. Samples taken from forced inspections are tested in laboratories near Surabaya, some of which are target laboratories. Based on results of tests, the closure of factories and the punishment of relevant persons may be executed. The procured equipment contributes to compliance with environmental regulations.

(2) Impact on the environment

Negative effects from the target laboratories on the surrounding environment were not observed during the field survey. In accordance with MOE Regulation No.6 of 2009, which has been effective since April 2009, an accredited environmental laboratory is required to obtain ISO17025. As the accreditation of ISO17025 demands the appropriate treatment of waste water, the laboratories visited are now dealing with this requirement.

2.2 Sustainability

After the ex-post evaluation, many of the target laboratories changed their affiliation from the Ministry of Public Works (MOPW) and MOH to provincial governments. While the relocation of equipment has been carried out in a handful of provinces, in other provinces equipment is still located at the laboratories where it was originally installed and these laboratories still have the right of use. As the Ministry of Environment (MOE) still has ownership of the equipment, some laboratories have inappropriate audit results that show allocation of O&M budget to equipment which is not included in their accounting. As technical aspects, the Environmental Impact Management Laboratories (formerly the Environmental Management Center, EMC) were providing training for the target laboratories at the time of the ex-post evaluation. At the time of the ex-post monitoring, the Environmental Impact Management Laboratories provided training to environmental departments. The target laboratories have training in various other institutions.

2.2.1 Operation and Maintenance Agency

2.2.1.1 Structural Aspects of Operation and Maintenance

Along with the progress of decentralization, many of the target laboratories changed their affiliation from MOPW and MOH to provincial governments. Out of 20 laboratories where the questionnaire survey confirmed that equipment still remains, the laboratories under MOI continue to be under the same ministry. However the laboratories under MOPW and some of the laboratories under MOH are now under provincial governments (See Table 4).

Table 4: Affiliation of laboratories

Name of Laboratory (at the time of appraisal)	At the time of Ex-post Evaluation	At the time of Ex-post Monitoring
Public Works Laboratory, MOPW (PU)	MOPW, Provincial govt.	Provincial govt.
Industrial Research and Development Laboratory (BPPI)	MOI	MOI
Cellulose Research and Development Center, MOI (BBS)	MOI	MOI
Public Health Laboratory, MOH (BLK)	MOH, Provincial govt.	Provincial govt.
Environmental Health Laboratory (BTKL)	MOH	MOH

MOPW: Ministry of Public Works, MOI: Ministry of Industry, MOH: Ministry of Health

Source: Questionnaire survey with the laboratories, ex-post evaluation on the Bepedal Regional Monitoring Capacity Development Project

At the time the of ex-post evaluation, there was a policy to transfer the ownership of equipment to provincial governments and the location and the right of use equipment to provincial environmental departments. In North Sumatra and South Sumatra provinces, the equipment was relocated. At the time of the ex-post monitoring, MOE still had ownership and the relocation of equipment was confirmed in Lampung (see Table 5). The laboratories where equipment was originally installed still have the right of use. Even in cases where the location and right of use of equipment were changed, the ownership was not transferred. The transfer of ownership requires approval from the Ministry of Finance but this process is delayed.

At the laboratories where equipment is installed, interviewees explained the reason for non-relocation as follows: relocation would be the interruption in service to clients, provincial environmental departments do not have to own a laboratory as testing is possible at a number of laboratories. In West Jawa province, the provincial government decided not to move equipment from the laboratories where it was initially installed.

Table 5: Structure of O&M

	At the time of ex-post evaluation (2003)	At the time of ex-post monitoring (2009)
Ownership of equipment	To be transferred from MOE to provincial governments (the policy was informed provincial governments in December 2002)	The policy to transfer ownership is valid but MOE still has ownership due to a delay in the procedure.
Installation site	To be move to provincial environmental departments where relocation is possible. The equipment has been relocated in North Sumatra and South Sumatra provinces.	Equipment was moved in Lampung province as well as in North Sumatra and South Sumatra provinces. In other states, transfer is not confirmed.
Right of equipment use	The laboratories where equipment is installed have the right of use.	Ditto

Source: Interview at MOE, Questionnaire survey with the target laboratories

2.2.1.2 Technical Aspects of Operation and Maintenance

The Environmental Impact Management Facilities under MOE provided training to provincial departments of environment and regional laboratories, including the target laboratories, up to 2006 (after the ex-post evaluation). Out of 20 laboratories where the questionnaire survey confirmed that equipment still remained, 7 laboratories replied that they participated in training at EMC. At the time of the ex-post monitoring, the Environmental Impact Management Facilities still conducted training for environmental departments in local governments. The target laboratories had training in various other institutions. Among the laboratories visited, many had the training for equipment use at the Indonesian Institute of Sciences (LIPI) and training for laboratory management at private consulting firms which

provide services to assist in ISO-accreditation.

Out of 20 laboratories where the questionnaire survey confirmed that equipment still remained, 15 laboratories replied that spare parts for equipment are still available but are difficult to obtain. Interviews at the laboratories visited revealed that the laboratories requested repairs via suppliers who carry measuring instruments and that response was not smooth except in Jakarta, Surabaya, and the outskirts of these cities. It takes several months to one year to obtain spare parts, occasionally out of Indonesia, even if a repair service is available.

2.2.1.3 Financial Aspects of Operation and Maintenance

A majority of the 10 laboratories visited during the field visit are allocated an operational budget from ministries and provinces.⁴ In these laboratories, service fees from clients must contribute to the revenue of ministries and provinces and the appropriation of revenue to O&M is not allowed. The laboratories which currently use the procured equipment take expenses for the O&M of the equipment. As MOE has the ownership of equipment, some laboratories have inappropriate audit results allocating O&M budget to equipment which is not included in their accounting books.

The asset life of the procured equipment is approximately 5 years. The equipment can be retired after this period is over. The retirement of equipment needs to follow procedures set by the Ministry of Finance. In general, however, the retirement of equipment is very rare because of these cumbersome procedures.

2.2.2 Current Status of Operation and Maintenance

For the 10 laboratories visited during the field survey, the main purpose of the equipment is to meet clients' requests for testing. Equipment little used for testing, such as GC and TOC, are more likely to remain unrepaired after machine troubles.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

In view of the number of testing samples and the number of laboratories accredited ISO17025, it can be concluded that there has been no significant change in effectiveness. For the effective use of equipment, not only the capacity of laboratories but also assessment of needs is an important factor. The role of the target laboratories remains to test samples upon the request of clients as it was at the time of the ex-post evaluation. As for sustainability, the policy was to transfer the ownership of the procured equipment from MOE to provincial governments. However, MOE still retains ownership due to the slow progress of transfer. Furthermore, some laboratories have inappropriate audit results that allocate O&M budget to equipment which they

⁴ Only the Dinas PU laboratory in South Kalimantan is on a self-supporting basis.

do not own.

3.2 Lessons Learned

(1) Needs assessment by the executing agency

The main purpose of equipment use is to meet requests for testing from clients. As equipment little in demand for testing is likely to remain unrepaired, the needs assessment of equipment affects sustainability. At the time of the ex-post monitoring, testing demand for UV-VIS, AAS, and portable multi gas analyzers is strong. On the other hand, that for TOC and GC is weak. The type of equipment is determined by the affiliation of laboratories as the number of target laboratories is too high for them to be assessed one by one. However, laboratories under the same ministry have different types of clientele and face various testing demands. Equipment little in demand for testing was procured as a result of this. In cases where dispersed project sites do not allow needs assessment, it is desirable that advantage is taken of finance schemes, such as sector loans, in which the executing agency conducts needs assessment and flexibly changes the scope of project, on condition that the implementation capacity of the executing agency can be assured.

3.3 Recommendations

(1) Ownership and right of use of the equipment (for MOE)

Since the ownership and the right of use do not matched for the procured equipment, allocating O&M budget to the equipment can be misappropriated in the strict sense. This situation may prevent appropriate O&M. The immediate transfer of ownership is desirable. In the case that the transfer of ownership is unlikely to be completed in the near future, it is recommended that budget allocation is allowed for the O&M of equipment with proof of the right of use.

(2) Retirement of obsolete equipment (for MOE)

After a decade since procurement, aging, wear and tear, and the unavailability⁵ of spare parts has disabled some of the equipment. Equipment which has passed its asset life and which is difficult to be repaired is still on the accounting books and is not yet retired. In order to accelerate the renewal of equipment, it is recommended that this equipment is disposed of, following proper accounting procedures.

⁵ Laboratories pointed out some reasons, one of which is that suppliers' inadequate response requires the procurement outside of Indonesia.

Comparison of Original and Actual Scope

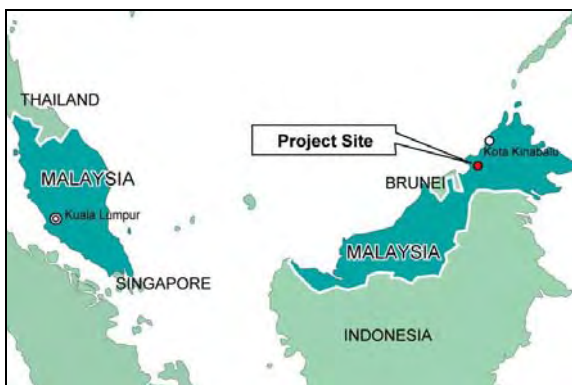
Item	Original	Actual
Project Output:		
Provision of water quality monitoring equipment	39 laboratories in 14 provinces	As planned
Provision of air quality/noise monitoring equipment	26 laboratories in 14 provinces	As planned
Provision of mobile laboratories	15 laboratories in 15 provinces	As planned
Consulting services	Foreign: 92 M/M Indonesian: 134 M/M	Foreign: 110 M/M Indonesian: 190 M/M
Project Period:		
Consultant selection	June 1995	November 1995
Tender / Contract	December 1996	November 1999
Procurement / Installation	November 1997	October 2000
Maintenance phase	December 1998	November 2001
Project Cost:		
Foreign currency	2,935 million yen	2,349 million yen
Local currency	401 million yen (8,035million rupiah)	394 million yen (17,440 million rupiah)
Total	3,336 million yen	2,743 million yen
ODA loan portion	2,935 million yen	2743 million yen
Exchange rate	1IDR = 0.05 yen (as of November 1994)	1IDR = 0.226 yen (Average between September 1996 and June 2001)

Malaysia

Ex-post Monitoring of Completed ODA Loan Project
“Rehabilitation of the Tenom Pangi Hydropower Project”

External Evaluator: Nobuyuki Kobayashi
(OPMAC Corporation)
Field Survey: September, 2009

1. Project Description



Map of the project area



Water intake gate of the Tenom Pangi Hydropower Station

1.1 Project Objective

The objective of this project is to secure the stable supply of electricity by rehabilitating the Tenom Pangi Hydropower Station damaged by flooding in the State of Sabah, thereby contributing to the growth of local economy.

1.2 Outline of the Loan Agreement

Approved Amount/ Disbursed Amount	543 million yen / 299 million yen
Loan Agreement Signing Date/ Final Disbursement Date	May 1992 / September 1999
Ex-post Evaluation	FY 2003
Executing Agency	Sabah Electricity Sdn. Bhd. (SESB)
Main Consultant	Japanese companies, etc.

1.3 Background of Ex-post Monitoring

The Tenom Pangi Hydropower Station is a conduit type hydropower plant on the Padas River with a maximum capacity of 66MW. It was constructed with assistance of Japanese ODA loans. The power station started operation in 1984 but torrential downpours in 1988 damaged the water intake gate (the trash boom and vertical gate) and resulted in unstable operations. This

project implemented civil works to prevent accidents which could cause outages as well as the repair of damaged facilities. Ex-post evaluation confirmed the recovery of power generation but it also revealed that the rehabilitated facilities had been damaged again. Among the facilities repaired by this project, the trash boom, the strainer / sand separator, and the river flow rate forecasting system were seriously damaged. The trash boom lost its floats and could not trap trash at the water intake gate only a few weeks after its completion. The strainer / sand separator also started malfunctioning a few weeks after completion, requiring the switch to an older system. The river flow forecasting system also did not function and suffered from sand clogging at meters. Some parts were stolen. Since this damage was expected to cause outages at the time of the ex-post evaluation, the sustainability of project benefit was in doubt. Therefore, this project was selected for ex-post monitoring and each criterion reviewed with the findings from the field survey and other research activities. The conclusion was then drawn.

2. Monitoring Results

2.1 Effectiveness (Impact)

Power generation of the Tenom Pangi Hydropower Station increased after the ex-post evaluation and remained at a high level (above 500GWh in FY2007 and FY2008). Although power generation decreased due to the repair of the generators in FY2009, it is expected that it will recover as repair works are completed at the end of FY2009. The trash boom is still damaged at the time of the ex-post monitoring but this damage only marginally affects the operation of the power station.

2.1.1 Quantitative Effects

(1) Electricity generation and maximum output of Tenom Pangi Hydropower Station

The rehabilitation works which this project implemented ended in 1998. Following this, the average annual electric generation from 1999 to 2002 reached 423GWh.¹ After the ex-post evaluation, annual electric generation stood from 400 GWh to 510GWh between 2003 and 2008 and the average climbed to 466GWh (see Table 1 and Figure 1). Furthermore, annual electric generation recorded a new high in 2007. A considerable decrease in the annual electricity generation for FY2009 was due to the replacement of hydropower parts and the emergency repairs of the Generation Unit III. Repairs were completed in August 2009 and, thus, electricity generation is expected to recover. At the time of the ex-post monitoring, the damage to the trash boom still remains and flooding may cause further damage around the water intake gate. As the damage to the trash boom does not result in a reduction in electricity generation, its influence on daily operations is considered relatively marginal (further details on the damage to the trash boom can be seen in “2.2.2 Current Status of Operation and Maintenance”).

¹ Based on the ex-post evaluation report, “Malaysia: Rehabilitation of the Tenom Pangi Hydropower Project”

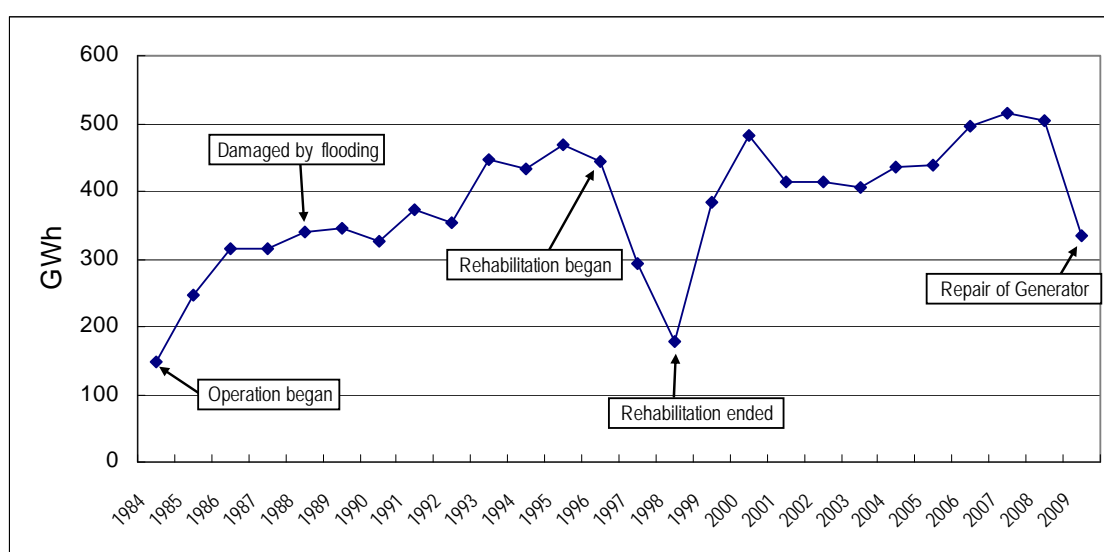
Table 1: Annual electricity generation of Tenom Pangi Hydropower Station

Unit: GWh

Fiscal Year ²	2002	2003	2004	2005
Electricity Generation	414.6	405.94	435.17	438.63

Fiscal Year	2006	2007	2008	2009
Electricity Generation	496.40	514.07	505.33	334.30

Source : SESB

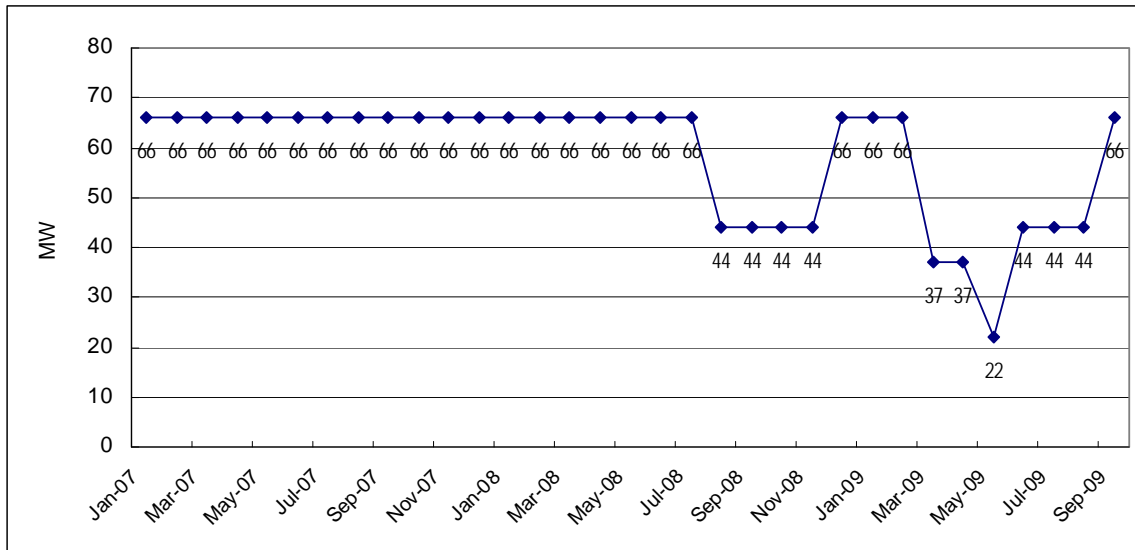


Source: SESB

Figure 1: Annual electricity generation of Tenom Pangi Hydropower Station

The maximum capacity of the Tenom Pangi Hydropower Station is 66MW (22MW × 3 units). As mentioned earlier, however, maximum capacity started to decrease in August 2008 due to the replacement of hydropower parts and emergency repairs on the Generation Unit III (see Figure 2). After completion of the repairs, the maximum capacity recovered to 66MW after September 2009.

² In Table 1 and Table 2, SESB's fiscal year is from August to September.



Source: SESB

Figure 2: Maximum capacity of Tenom Pangi Hydropower Station

(2) Outage hours for the Tenom Pangi Hydropower Station

The outage hours for the Tenom Pangi Hydropower Station during the last three years (total hours of the three generators) is shown in Table 2. The large increase in unplanned outages in FY2008 was due to the emergency repairs on the Generator Unit III. Unplanned outages are expected to decrease after the completion of repair work on the Generator Unit III.

Table 2: Outage hours for the Tenom Pangi Hydropower Station

Unit: hour

Fiscal Year	2007	2008	2009
Unplanned	85.73	263.26	2177.50
Planned	174.41	281.75	882.47
Total	260.14	545.01	3059.97

Source: SESB

(3) Financial Internal Rate of Return (FIRR)

The FIRR of this rehabilitation project is reviewed in accordance with the FIRR calculation method at the time of the ex-post evaluation. The FIRR reaches 12.1%, a rate which is higher than the 9.2 % at the time of the ex-post evaluation. The actual incremental electricity generation after the completion of this rehabilitation project surpasses the estimation made at the time of the ex-post evaluation. The increase in incremental electricity generation contributes to the higher return of the FIRR. The recalculation of the FIRR is based on:

Cost : investment, opportunity costs during project implementation, and O&M costs³
 Benefit : incremental sales of electricity (incremental electric generation⁴ × sales price⁵)
 Project life : 50 years after the completion of the power plant (until 2033)

2.1.2 Impact

(1) Contribution to the local economy

After the ex-post evaluation, the GDP of the state of Sabah has been growing at 5% per annum and the population at 2% per annum (see Table 3). In tandem with the economic and population growth, electricity consumption has recorded a high level of growth. Electricity generation by the Tenom Pangi Power Station accounted for 12% of that of Sabah in 2008, which accounted for 15% at the time of the ex-post evaluation. In light of its share in the electric supply in Sabah, the Tenom Pangi Hydropower Station remains a major source at the time of the ex-post monitoring and plays a vital role in sustaining the growth of the local economy.

Table 3: GDP, Population and Electricity Consumption in the State of Sabah

	Ex-post Evaluation	Ex-post Monitoring	Rate of Increase / Year
GDP (Prices in year 2000, million RM) ⁶	21,702	26,563	5.18%
Population (thousand) ⁷	2,603.5	3,219.2	2.69%
Electricity consumption (GWh) ⁸	2,118.1	3,384.7	8.13%

Source: Department of Statistics Malaysia, SESB

(2) Supply and demand in the State of Sabah

- Electricity statistics

In the State of Sabah, the supply and demand in electricity is tighter now than at the time of the ex-post evaluation. The Tenom Pangi Hydropower Station shoulders a critical burden for the supply of electricity. A significant growth in electric demand contributes to this tighter supply and demand, though both generation capacity and electric generation have increased in Sabah (see Table 4). The Ninth Five-year Plan aims to ensure 20% of power generation for SESB from coal-fired power plants. However, there are strong concerns regarding the negative impact on the environment, which has resulted in a slow switching to coal-fired power plants, and which

³ Investment, opportunity cost during project implementation, and O&M costs are based on data at the time of ex-post evaluation. O&M cost is estimated at 2% of accumulated investment costs.

⁴ Incremental electricity generation is based on actual data for 2003-2009 and the average for 2003-2009 after 2010.

⁵ Electric prices have not been revised since the time of the ex-post of evaluation. For this reason, the sales price is based on the CPI-adjusted sales price at the time of the ex-post evaluation.

⁶ The figure at the time of the ex-post evaluation is based on actual data for 2002. The figure at the time of the ex-post monitoring is based on preliminary data for 2006.

⁷ The figure at the time of the ex-post monitoring is based on the population census of 2000. The figure at the time of the ex-post monitoring is the estimated data for 2008.

⁸ The figure at the time of the ex-post evaluation is based on actual data for 2002. The figure at the time of the ex-post monitoring is based on the actual data for 2008.

in turn is one of the reasons behind the tighter supply and demand.

Table 4: Supply and demand of electricity in the State of Sabah⁹

	At the time of Ex-post Evaluation	At the time of Ex-post Monitoring
Units generated per annum (GWh)	2,736.4	4,176.3
Units consumed per annum (GWh)	2,118.1	3,384.7
Unit generated/Units consumed	129.2%	123.4%
Installed capacity (MW)	768	959
Peak demand (MW)	447.0	646.9
Generation Capacity/Peak Demand	171.8%	148.3%

Source: Department of Statistics Malaysia, SESB

- Questionnaire survey and non-structured interviews with consumers

In order to assess the demand and supply of electricity, a questionnaire survey and non-structured interviews with 15 manufacturing plants in Kota Kinabalu, the state capital of Sabah, were conducted.¹⁰ For comparable information, an identical survey and interviews were carried out at 5 plants in the Kota Kinabalu Industrial Park (KKIP) which has a preferential supply of electricity. The questionnaire survey and non-structured interviews proved that the demand and supply of electricity was tight.

Photo 1: Questionnaire survey with consumers



Among the manufacturers in Kota Kinabalu, more than a half of the respondents chose “Unstable” or “A little unstable” to describe the electricity supply. Similarly, a majority selected “More unstable” regarding the stability of the electric supply compared with 5 years ago (see Table 5 and Table 6).

Table 5: Current status of the energy supply

	Very unstable	Unstable	A little Unstable	Stable
Kota Kinabalu City	0	5	8	1
KKIP	0	0	1	4

⁹ The figure at the time of the ex-post evaluation is based on actual data for 2002. The figure at the time of the ex-post monitoring is based actual data for 2008.

¹⁰ The questionnaire survey and non-structured interviews were conducted at Kelomnong, Inanam, and Penampang in early September 2009.

Table 6: Status of the energy supply compared with 5 years ago

	More Stable	Unchanged	More Unstable	Do Not Know
Kota Kinabalu	1	5	7	2
KKIP	2	1	1	1

Non- structured interviews revealed that an insufficient supply of electricity caused rotating blackouts in some areas in Kota Kinabalu. The tight supply and demand is not the sole reason for blackouts as accidents on distribution lines are also blackout cause. Interviewees explained the negative effects of blackouts as followed: blackouts jeopardize the quality of products, often waste work-in-progress products, prevent employees from working. Many manufacturing plants in Kota Kinabalu own back-up generators but some plants do not, due to insufficient capacity and additional costs. On the other hand, there is no plant with a back-up generator in KKIP.

(3) Environmental and social impacts

As the project scope is mainly the rehabilitation of damaged facilities, land acquisition and resettlements were not carried out. During the site visit, significant changes in the environment after the ex-post evaluation were not observed.

2.2 Sustainability

After the ex-post evaluation, there has been no significant change in the structural aspects of operation and maintenance (O&M). As for the technical aspects, technological capability is maintained by periodic training and has reached a satisfactory level by technological transfer. Regarding the financial aspects of O&M, a review of the financial statements of Tenaga Nasional Berhad (TNB), the parent company of SESB, shows that TNB's profitability and financial stability improved between the ex-post evaluation (2003) and the ex-post monitoring (2008). The ex-post evaluation pointed out damages in the trash boom, the strainer / sand separator, and the river flow forecasting system. The executing agency properly coped with the damages excepting in one case at the trash boom. The current status of O&M shows improvement.

2.2.1 Operation and Maintenance Agency

2.2.1.1 Structural Aspects of Operation and Maintenance

SESB is responsible for the O&M of the Tenom Pangi Hydropower Station. SESB is a vertically integrated electric supplier and conducts generation, transmission, and distribution activities. In the operational units of SESB, the Division of Generation is in charge of the O&M of the power station. After the ex-post evaluation, the state-owned electric company TNB has continued to be a controlling shareholder of SESB and owns 80% of the total shares outstanding. SESB is included in the consolidated financial statements of TNB.

2.2.1.2 Technical Aspects of Operation and Maintenance

At the time of the ex-post monitoring, 98 employees were working at the Tenom Pangi Hydropower Station. Out of these, 75 employees were engaged in the O&M of the power station. At the time of ex-post evaluation, considering the technological transfer during the project implementation of this project, the technological level was evaluated to be satisfactory. At the time of the ex-post monitoring, SESB maintained technical capability at the power station by periodic training. For employees at the power station, SESB currently conducts internal training on the operation of power plants (7 courses) twice a year. While routine maintenance (inspection on a daily, weekly, and monthly basis) and periodic maintenance (twice a year) are conducted by power plant staff, overhauls (once every 10 years) and emergency repairs (whenever necessary) are outsourced to a contractor (TNB REMACO). Spare parts are available but it takes time to obtain them.

2.2.1.3 Financial Aspects of Operation and Maintenance

Since the financial statements of SESB are not disclosed to the public, financial stability is analyzed from the financial statements of the parent company TNB (see Table 7)¹¹. The Return on Assets (ROA) fluctuates year by year but Interest Payment/EBIT suggests that TNB has enough profit to satisfy interest payments¹². As the Debt-to-Equity Ratio is stable and the Current Ratio has remained at 1.5, it can be concluded that TNB is financially stable. Compared with financial ratios at the time of the ex-post evaluation, the ROA shows a better profitability and the Interest Payment/EBIT and the Debt-to-Equity Ratio suggests an improvement in financial stability at the time of the ex-post monitoring. Although the executing agency SESB has not revised electricity prices since 1986, the solid financial stability of TNB guarantees that the financial status of SESB has only a very marginal influence on the sustainability of this project.

Table 7: Financial Ratios of TNB

Fiscal Year	2003	2004	2005	2006	2007	2008
Interest Payment/EBIT	0.44	0.48	0.47	0.37	0.21	0.27
ROA	1.77%	1.28%	2.02%	3.32%	6.01%	3.72%
Current Ratio	0.92	1.73	1.22	1.41	1.51	1.68
Debt to Equity Ratio	3.27	3.26	2.92	2.33	1.81	1.71

Source: TNB

2.2.2 Current Status of Operation and Maintenance

This project implemented 1) the rehabilitation of the hydropower station, 2) the rehabilitation of civil works, and 3) the establishment of the river flow forecasting system. The

¹¹ The financial ratios are calculated on the financial data from the annual reports from FY2003 to FY2008 (consolidated basis). All of the annual reports are publicly disclosed.

¹² EBIT: Earning before Interest Payment and Tax

ex-post evaluation pointed out that, out of the facilities repaired and improved by this project, the trash boom, the strainer / sand separator, and the river flow forecasting system had been damaged. The executing agency conducted repair works on these facilities. Except for the trash boom, these facilities are now in a better condition. The current status of these facilities is as follows:

(1) Trash boom

At the time of ex-post evaluation, the facility to trap trash was broken as the floats of the trash boom had been washed away. In 2004 (after the ex-post evaluation), a structure for catching trash was constructed in front of the water intake gate (see photo 2).¹³ After half year from the completion of construction, however, damage occurred again. At the time of the ex-post monitoring, no facility to prevent the clogging of trash had been installed at the water intake gate (see photo 3).

Photo 2: Water intake gate after the ex-post evaluation



Photo 3: Water intake gate at the time of the ex-post monitoring



As counter measures, the executing agency is currently:

- 1) Expanding meshes in the trash grills installed in the water intake gate so that clogging of trash does not occur
- 2) Raking trash in the settling basin placed between the water intake gate and the water tunnel. Trash screens are placed in the settling basin. Raking machines are currently in use.
- 3) Stopping the power plant, opening the diversion gate, and washing way trash, when a great quantity of trash appears.

The lack of a facility to catch trash causes the danger of clogging and damage to the water intake gate. In the case of 3), furthermore, a switch to a high cost power source such as a diesel

¹³ SESB conducted the comparison analysis between the period in which the structure was installed and the same period of the previous year. The electric outage derived from the action 3) on the next page is reduced by approximately 60% from 4177MWh to 1766 MWh.

generator or natural gas-fired generator is required in order to cope with the insufficient supply of electricity. For this reason, the executing agency plans to redesign and install the trash boom with an improvement in materials and movable parts.

(2) Strainer / Sand separator

The Tenom Pangi Hydropower Station separates sand from river water and produces cooling water. The water is used for cooling the bearings in the generators. At the time of the ex-post evaluation, the strainer / sand separator was not used because of malfunction. A new system was installed after the ex-post evaluation and the cooling system was updated. As sand clogging is less than at the time of the ex-post evaluation, cleaning of the cooling system does not hinder operation.



(3) River flow forecasting system

Although this project created gauging stations at three locations (Kemabong, Ansip, and Biah) in the upper Padas River, these gauging stations were not functioning at the time of the ex-post evaluation. After the ex-post evaluation, SESB reestablished three gauging stations working together with the Irrigation and Drainage Department of Sabah State. At the time of the ex-post monitoring, flooding had damaged and one station disabling its function while other two stations continued to send data to the power station. The gauging stations are unmanned and the equipment in the stations is extremely prone to theft. For tighter security, SESB cooperates with the government which owns a facility nearby and their staffs inspect the gauging stations more frequently than before.

Amongst other civil works which had been rehabilitated by this project, several gabion walls collapsed due to landslides. However, access roads to the power plants were well-maintained after the landslides, thus the traffic within the power station was not negatively affected. Other facilities and equipment have sustained no serious damage and the operation of the power station is not otherwise hindered.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

The trash boom in front of the water intake gate was still damaged at the time of the ex-post evaluation but power generation had recovered and a negative effect on the operation of the power station was not confirmed. The supply and demand of electricity in the State of Sabah

is tighter than at the time of ex-post evaluation. The Tenom Pangi Hydropower Station plays a crucial role in power supply. The damaged facilities, except the trash boom, are now in a better condition. As the executing agency took appropriate remedial action for the problems raised by the ex-post evaluation, this project is still significant at the time of the ex-post monitoring.

3.2 Lessons Learned

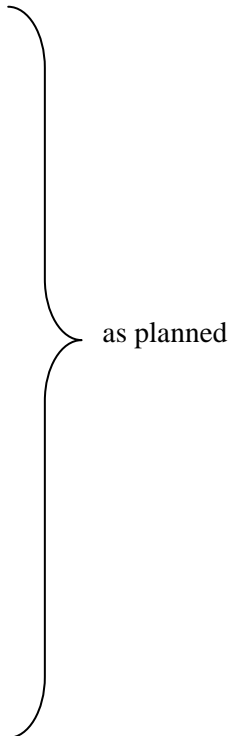
None

3.3 Recommendations

(1) Monitoring of repair work on the trash boom (for SESB)

The ex-post monitoring revealed that the trash boom had not been set up and, for this reason, trash had gathered nearby the water intake gate. The executing agency SESB plans to review the design and reconstruct the trash boom. However, the trash boom has broken three times (before project implementation, after project implementation and after the ex-post evaluation) and this trouble is in danger of developing into damage of the water intake gate, a similar accident which occurred in 1988. As trash clogging at the water intake gate is unavoidable due to the design of the power station, it is recommended that the executing agency continues to monitor both trash clogging and its effects on the operation of the power plant and remove trash periodically.

Comparison of the Original and Actual Scope

Item	Original	Actual
Project Outputs: <u>Trash control</u> 1) Trash boom 2) Movable protection rack 3) Strainer/Sand Separator 4) Differential pressure detecting system <u>Rehabilitation of civil works</u> 1) Front footholds of side walls/ apron foot protectors 2) Gabion wall 3) Slope protection on access roads <u>Update of river flow forecasting system</u> 1) <u>River flow forecasting system</u> <u>Consulting service</u>	1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set Intern'l : 20.90 M/M Local : 25.50 M/M	 Intern'l : 21.24 M/M Local : 25.70 M/M
Project Period: Loan Agreement Selection of consultant Preparation of tender documents Tender Evaluation and Approval of Bids Signing of contract Construction works 1) Trash control 2) Rehabilitation of civil works 3) River flow forecasting system	May 1992 January 1993 - March 1993 April 1993 - May 1993 June 1993 - July 1993 August 1993 - September 1993 October 1993 July 1994 - November 1994 July 1994 - December 1994 July 1994 - October 1994	same as the left January 1995 April 1995 June 1996 September 1996 - January 1998 September 1996 - January 1998 September 1996 - July 1997
Project Cost: Foreign currency Local currency Total Japanese ODA loan portion Exchange rate	482 million yen 243 million yen 725 million yen 543 million yen RM 1=JPY46.6 (1994)	N/A N/A 485 million yen 299 million yen N/A

Uzbekistan

Ex-Post Monitoring of Completed ODA Loan Project
“Three Local Airports Modernization Project (1) (2)”

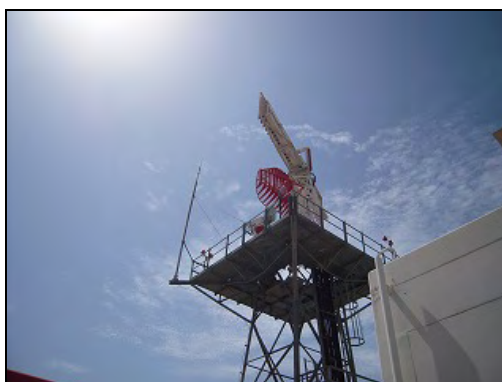
External Evaluator: Naomi Murayama
(OPMAC Corporation)

Field Survey: June – July, 2009

1. Project Description



Map of the project area



Urgench Airport radar tower

1.1 Project Objective

The objective of this project is to improve the functions of the international airports and to promote the development of the nation’s tourist industry as well as to increase safety by the development and modernization of airports at Samarkand, Bukhara and Urgench, all of which are located in significant areas of Uzbekistan, thereby contributing to the acquisition of foreign currency and the economic development of Uzbekistan.

1.2 Outline of the Loan Agreement

	Phase I	Phase II
Approved Amount / Disbursed Amount	15,526 million yen / 15,036 million yen	2,871 million yen / 2,786 million yen
Loan Agreement / Final Disbursement Date	December 1996 / December 2001	December 1999 / January 2003
Ex-post Evaluation	FY 2003	FY 2003
Executing Agency	Uzbekistan Airways	Uzbekistan Airways
Main Contractor	ALARKO (Turkey) • JOHN LAING INT’L LTD (UK) • Marubeni Co. (Japan) (JV), Mitsui & Co., LTD. (Japan) •	ALENIA MARCONI SYSTEMS S.P.A. (Italy)

	Mitsubishi Co. (Japan) • Shimizu Co. (Japan) (JV)	
Main Consultant	Japan Airport Consultants, Inc. (Japan)	Japan Airport Consultants, Inc. (Japan)

1.3 Background of Ex-post Monitoring

At the time of the ex-post evaluation, some concerns about effectiveness were pointed out as the number of arrivals and departures had declined since 1998/1999. There were also some concerns about the financial aspect of sustainability since all three airports had overspent every year between 1995 and 2002, the excess being covered by payouts from the budget of Uzbekistan Airways. Moreover, it was recommended that measures necessary to ensure the project objective of tourism development through airport modernization be considered, such as a review of the number and timetable of international flights.

Therefore, this project was selected for ex-post monitoring and was reviewed through each criterion together with the findings of the field survey and other research activities, leading in turn to the conclusion below.

2. Monitoring Results

2.1 Effectiveness (Impact)

After ex-post evaluation, the number of passengers arriving and departing dramatically increased at Samarkand Airport and Bukhara Airport due to the growing number of international flights used especially by local residents. The number of chartered flights from European countries has increased at Urgench Airport. All three airports have played an important role as international airports.

2.1.1 Quantitative Effects (Current Facilities Operating Conditions and Effectiveness)

(1) Improvement in airport safety

Airport safety complied with the standards of the International Civil Aviation Organization, hereafter ICAO, and this has been maintained since the ex-post evaluation. According to Uzbekistan Airways, there have been no accidents at any of the three airports since 2000 when the Project was completed¹.

The number of canceled and delayed flights at the three airports is as shown in Table 1 and Table 2 respectively. According to Uzbekistan Airways, reasons for cancellation and delay have mainly been owing to bad weather. Sometimes flights are cancelled when there are not enough

¹ However, according to data from the flight safety foundation, Aviation Safety Network, one accident was reported: that a takeoff was aborted because of power loss on a no. 1 engine where the plane could not be stopped on the remaining runway. The Yak overran 3000 meters 13/31. The right main landing gear leg collapsed. (<http://aviation-safety.net/database/record.php?id=20030409-1> as of Sep. 8, 2009)

passengers. No delay or cancellation was caused by accidents at the three airports and they are considered to be suitably secure.

Table 1: Number of canceled flights at the three airports

Unit: flight

Airport	2003	2004	2005	2006	2007	2008
Samarkand	—	—	—	—	—	—
Bukhara	3	20	3	41	6	11
Urgench	—	—	—	45	46	13

Source: Uzbekistan Airways

Table 2: Number of delayed flight at the three airports

Unit: flight

Airport	2003	2004	2005	2006	2007	2008
Samarkand	—	78	107	121	153	215
Bukhara	72	101	79	101	79	115
Urgench	—	—	—	73	83	131

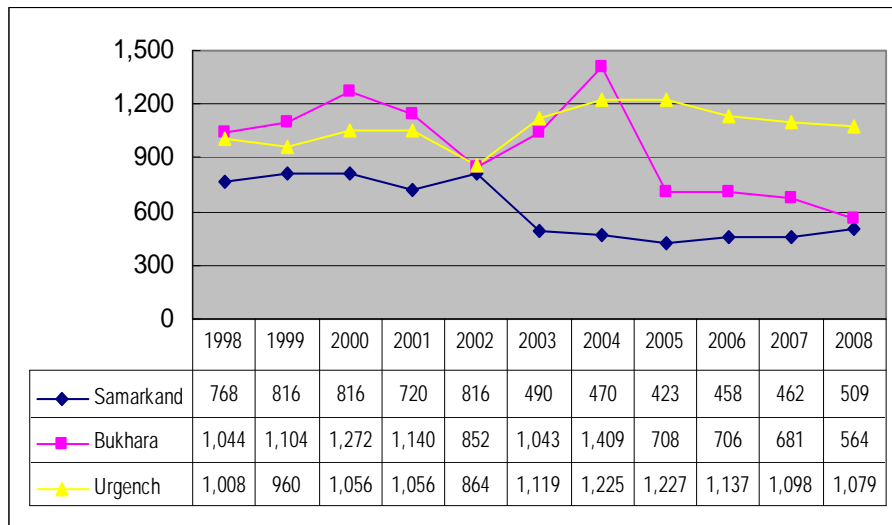
Source: Uzbekistan Airways

(2) Increase in flight numbers resulting from compliance with ICAO standards

The number of domestic flights is shown in Figure 1. At Samarkand Airport and Urgench Airport, the number of domestic flights has not changed substantially, although there have been fluctuations since 2003 when the ex-post evaluation survey was conducted. The number of domestic flights at Bukhara Airport peaked in 2004, but was down by half in 2005. Since then it has been on a declining trend. Uzbekistan Airways explains this as follows: recently flights between Tashkent and cities in the Commonwealth Independent States, hereafter CIS, have begun operating via Samarkand or Bukhara with large aircraft introduced on these routes, enabling the journey to be made in one flight. Therefore Uzbekistan Airways has decreased the number of flights between Tashkent and Samarkand or Bukhara aiming to reduce costs.

The number of international flights hovered at a low level between 2004 and 2005, affected by deterioration in the regional situation. Since 2005, however, the number has dramatically increased especially at Samarkand Airport and Bukhara Airport (Figure 2). This trend is pronounced among flights to CIS countries, particularly to major cities in Russia. The results of interviews with Uzbekistan Airways staff and the beneficiary survey conducted during this monitoring survey show that most users of international flights from Samarkand Airport or Bukhara Airport are local residents who aim either to work or to visit relatives in Russia. It can be seen, therefore, that the growing need for flights to major cities in Russia by local residents led to this increase in the number of international flights.

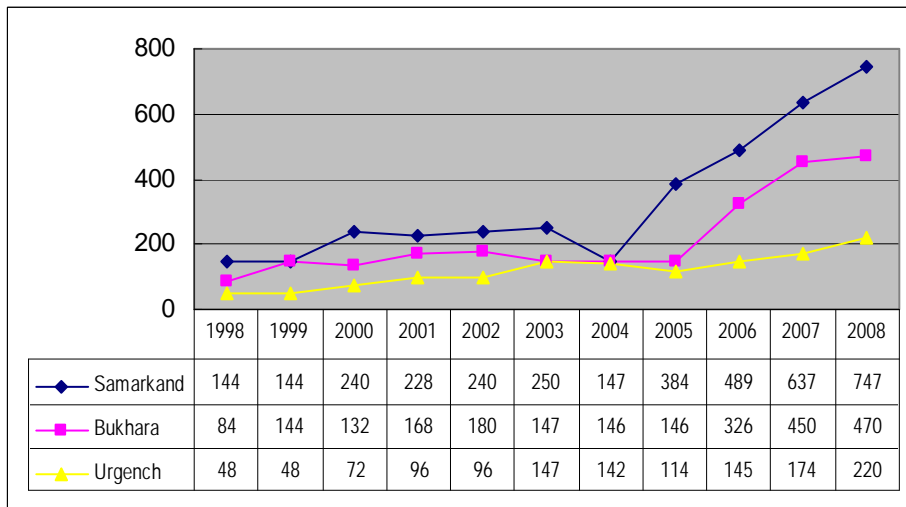
Unit: flight



Source: Uzbekistan Airways

Figure 1: Number of domestic flights at the three airports

Unit: flight



Source: Uzbekistan Airways

Figure 2: Number of international flights at the three airports

The number of regular international flights operated by Uzbekistan Airways and Russian Airlines at the time of the ex-post monitoring survey is as shown in Table 3 and Table 4 respectively. Since 2005 various Russian airlines have begun to operate international flights between each of the three airports and major cities in Russia. In addition, regular international flights between Urgench and Paris, Rome and Milan are planned to go into service from 2010.

Table 3: International regular flights by Uzbekistan Airways (as of August 2009)

Airport	Route	Year of starting service
Samarkand	Samarkand - Simferopol (Ukraine)	2006
	Samarkand - Kazan (Russia)	2006
	Samarkand - Moscow (Russia)	The Soviet era
	Samarkand - St. Petersburg (Russia)	The Soviet era
Bukhara	Bukhara - Moscow (Russia)	The Soviet era
	Bukhara - St. Petersburg (Russia)	The Soviet era

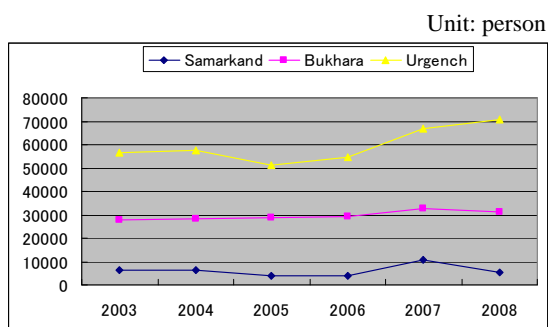
Source: Uzbekistan Airways

Table 4: International regular flights by Russian Airlines (as of August 2009)

Airport	Airline	Route	Year of starting service
Samarkand	Rossiya	Pulkov(St.Petersburg) - Samarkand	2005
	Moskoviya	Domodedovo (Moscow) - Samarkand	2006
	Atlant Soyuz	Vnokovo(Moscow) - Samarkand	2007
	Others	Charter flights by Airlines UM and Air Inter	
Bukhara	Moskoviya	Domodedovo (Moscow) - Bukhara	2005
	Atlant Soyuz	Vnukovo (Moscow) - Bukhara	2006
	Trans Aero	Domodedovo (Moscow) - Bukhara	2006
Urgench	SIBIR Airlines (S7 Airlines)	Domodedovo(Moscow) - Urgench	2007

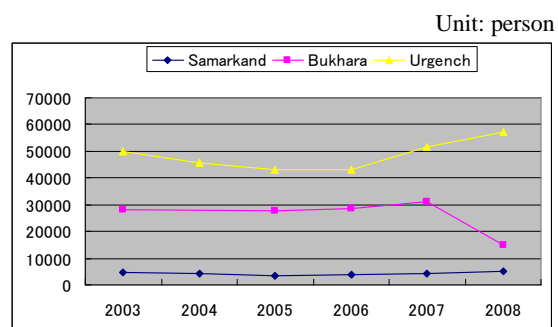
Source: Uzbekistan Airways

Although the number of domestic flights has been decreasing, the number of passengers arriving and departing at each of the three airports is stable (Figure 3 and Figure 4). It can be surmised from this that there have been improvements in transport efficiency through the use of larger aircrafts. The number of international flights and passengers has dramatically increased (Figure 2, Figure 5 and Figure 6). It is thought that this is due to compliance with the ICAO Standard.



Source: Uzbekistan Airways

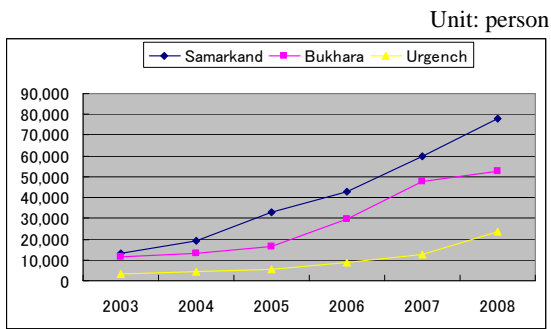
Figure 3: Number of domestic arrivals at the three airports



Source: Uzbekistan Airways

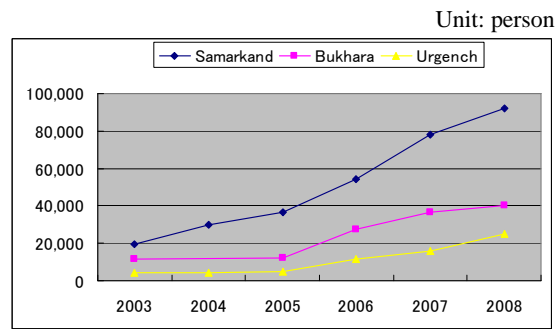
Figure 4: Number of domestic departures at the three airports²

² There is no record of numbers of departures at Bukhara Airport for 2004.



Source: Uzbekistan Airways

Figure 5: Number of international arrivals at the three airports



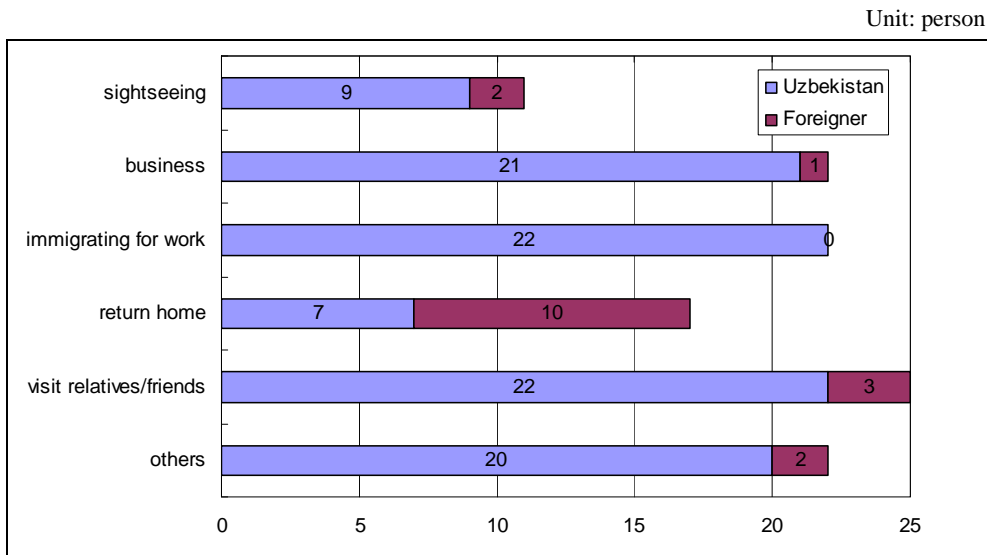
Source: Uzbekistan Airways

Figure 6: Number of international departures at the three airports³

2.1.2 Qualitative Effects

(1) Results of the beneficiary survey

The beneficiary survey was conducted with a sampling of 40 users and a total 120 samples, between July and September 2009, at Samarkand Airport, Bukhara Airport and Urgench Airport.⁴



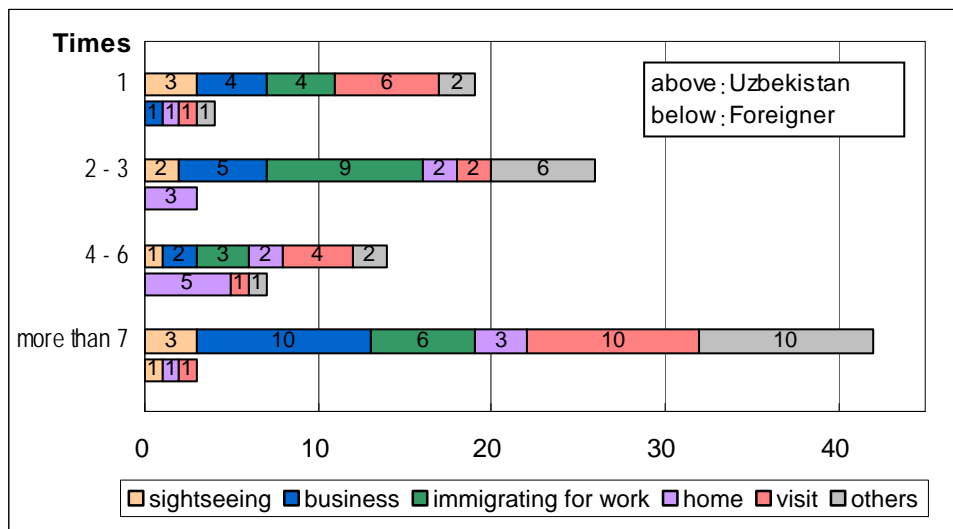
Source: Beneficiary Survey

Figure 7: Number of travelers using the airports and their purpose

³ There is no record of numbers of departures at Bukhara Airport for 2004.

⁴ Surveys were conducted in the departure lounge after check-in at each airport. The respondents were chosen by a random sampling method. Surveyors interviewed respondents in person in accordance with a prepared questionnaire.

Unit: person

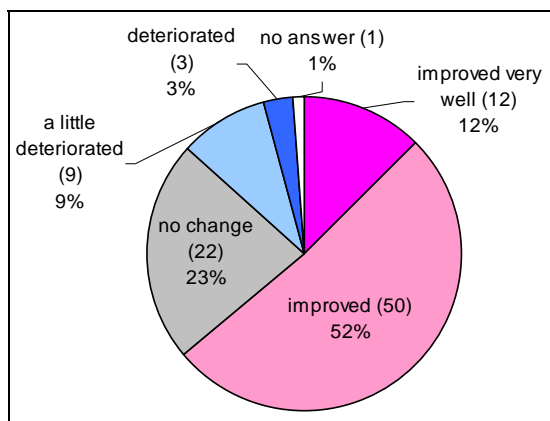


Source: Beneficiary Survey

Figure 8: Usage frequency of airports

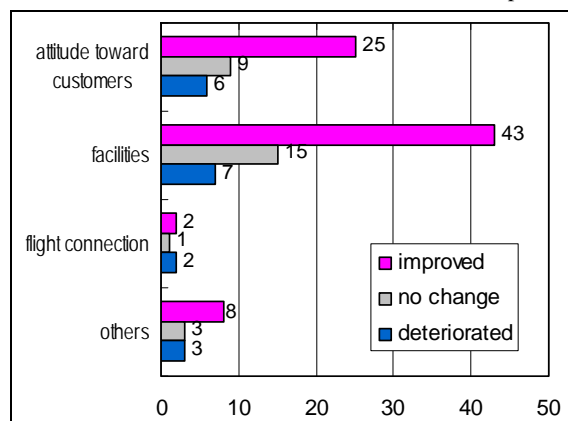
Most users planned to work, to do business or to visit relatives or friends in Russia. Only 9 percent of users lived in Uzbekistan, 9 out of 101, and only 11 percent of users lived abroad, 2 out of 19 (Figure 7) has the aim of sightseeing. Users show a strong tendency to take flights repeatedly regardless of their purpose (Figure 8).

Unit: person



Source: Beneficiary survey

Figure 9: Improvement of airports (1)

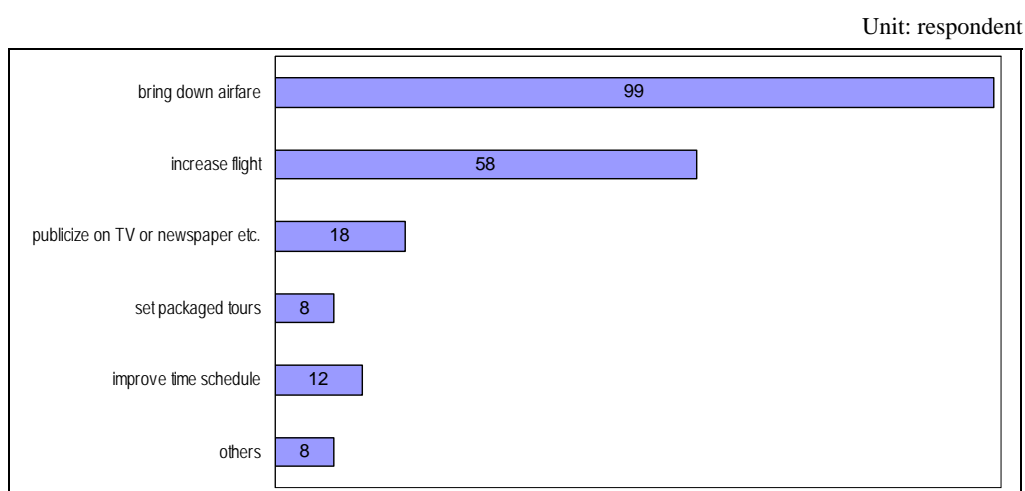


Source: Beneficiary survey

Figure 10: Improvement of airports (2) (multiple answers)

Sixty-four percent of the respondents (62 out of 97) who use the same airport more than twice answered that the airport got better than before (Figure 9). Forty-three people answered that facilities had especially improved. Twenty-five people answered that the airport staff's attitude toward passengers had improved (Figure 10). On the other hand, seven people answered that facilities had not improve sufficiently and six answered that the attitude of staff had not

improved. Compared to other answers, these answers accounted for a significant number. Although at the time of the ex-post evaluation, it was recommended that measures should be taken for the development of tourism, such as a review of the number and schedule of international flights, referring to Figure 10, there are not many respondents who answered that these were improved or even not. These results imply that these measures had not been recognized by users. In the answers to free response questions, there are many comments about the bad attitude and low quality of service of airport staff, including custom officers, as well as demands that facilities such as tax-free shops, internet access, ATM etc. be improved. Moreover, in the answers to the questions asking the points to be improved for promoting the utilization of the airports, there are many requests on reduction of air fares and increase in flights (Figure 11).



Source: Beneficiary survey

Figure 11: Points to be improved for promoting the utilization of the airports (multiple answers)

(2) Improvement in the convenience of the airports for passengers through the modernization of airport facilities

In addition to the above mentioned beneficiary survey, interview surveys⁵ with airport staff and major travel agencies were conducted regarding improvements in the convenience of the airports for passengers through the modernization of airport facilities. Some airport staff felt that the quality of service for navigating, landing and taking-off together with safety had increased through compliance with ICAO standards and the rehabilitation of airport control towers. Many travel agencies thought that modernization of the three airports was definitely a good thing as an airport is the face of the country that tourists see when they first arrive. Others said that the number of direct international flights had increased and more local residents were using flights.

⁵ For the interviews with staff at each airport, questionnaires were sent via Uzbekistan Airways in advance and interviews with persons in charge were conducted individually at each airport based on the questionnaire. Semi-structured interviews also took place with twelve travel agencies in Tashkent, Samarkand, Bukhara and Khiva which had been introduced by Japanese travel agencies specializing in Central Asian or Uzbek tourism

Moreover, there are other positive comments about the improvement of safety through modernized airport facilities and the increase in international flights.

Uzbekistan Airways has made efforts to improve convenience for passengers by reviewing their timetables based on the recommendations of major travel agencies made at meetings between Uzbekistan Airways, Uzbektourism and Uzbekistan Railways. However, many travel agencies harshly criticized Uzbekistan Airways' review of their timetable as it did not necessarily correspond to passengers' needs.

2.1.3 Impact

2.1.3.1 Attainment of Project Goals

(1) Promoting Tourism Development

The number of tourists in Uzbekistan has basically increased although it decreased temporarily due to the Andijan Massacre in 2005 (Table 5).

Table 5: Trend in the number of tourists⁶

	Unit: person				
year	2004	2005	2006	2007	2008
Total in Uzbekistan	261,600	241,900	272,200	353,800	377,450
Samarkand	336	653	710	1,475	2,000
Bukhara	72,103	60,468	73,602	101,232	111,448
Urgench/ Khiva	19,420	17,248	19,600	24,315	29,657

Source: Uzbektourism, Uzbekistan Airways

Simple comparisons of data in Table 5 cannot be made as it is from different sources and is based on different statistical bases. However, the numbers of tourists who use the airports in Samarkand and Urgench/Khiva after ex-post evaluation can be estimated to some extent as the data is limited to the number of airport users⁷.

Generally speaking, in Uzbekistan, foreign tourists get into the country from Tashkent and fly to Urgench. They then travel by land (on buses and trains) from Urgench to tourist spots in Bukhara and Samarkand. They leave the country from Tashkent or take a reverse route. Tourists generally take flights to Urgench as it is located more than 1,000 km from Tashkent. On the other hand, Samarkand is located at an approximately 4-5 hours distance by bus or train. In comparison with the time it takes to get to the airport and for boarding procedures, buses or trains are more convenient, their fares also being lower than flights as well as the negligible

⁶ The total number of tourists in Uzbekistan is the number of foreign tourists who visit Uzbekistan. It is not limited to airport users. (source: Uzbektourism) The number of Samarkand is the number of arrivals by chartered flights or aircrafts of tourists themselves. (source: Uzbekistan Airways, Samarkand Airport) The number of Bukhara is the number of tourists who visit Bukhara for one year. It is not limited to airport users and it includes domestic tourists. (Source: Uzbektourism Bukhara office) The number of Urgench is the number of tourist who departed from Urgench Airport or were members of registered group tours. (source: Uzbekistan Airways, Urgench Airport)

⁷ The total number of tourists who used the airports is not illustrated.

difference in time required for the journey (Table 6). Tourists do not therefore use the airports in order to travel from Tashkent to Samarkand. Moreover, as Bukhara is located between Samarkand and Urgench/Khiva and Shahrisabz, a tourist spot only accessible by land, is between Samarkand and Bukhara, airplanes are not used in this case either⁸. Therefore tourists generally travel by land in order to visit Bukhara.

Table 6: Comparison with other modes of transportation for the journey between Samarkand and Tashkent⁹

Mode	fare	Time (hour)	number	remarks
Uzbekistan Airways				
First class	€104	1	6/week	
Business class	€3			
Economy class	€36			
Uzbekistan Railway				
Business class	18,000 sum (about €3.5)	4	5/week	Express train “Sharq”
Economy class	12,000 sum (about €5.7)			
National Bus				
—	7,100 sum (about €3.4)	4~5	Everyday (8/ week)	

Source: various references

At present, in order to promote tourism development in Uzbekistan by integrated measures, the Government of Uzbekistan has set up a cross-organizational working group comprising of the ministries concerned, agencies and local governments. It is also implementing the “Tourism Development Program 2009-2015”. As part of the program, integrated tourism redevelopment is being undertaken in Samarkand through the large-scale rehabilitation of tourism infrastructure and guidance for hotels in Samarkand in order that they can improve their service in compliance with international standards.

(2) Promoting Economic Development

As cargo volumes at each airport have varied quite a bit through the years, it is difficult to say how much the Project has contributed to economic development in Uzbekistan (Figure 12)¹⁰.

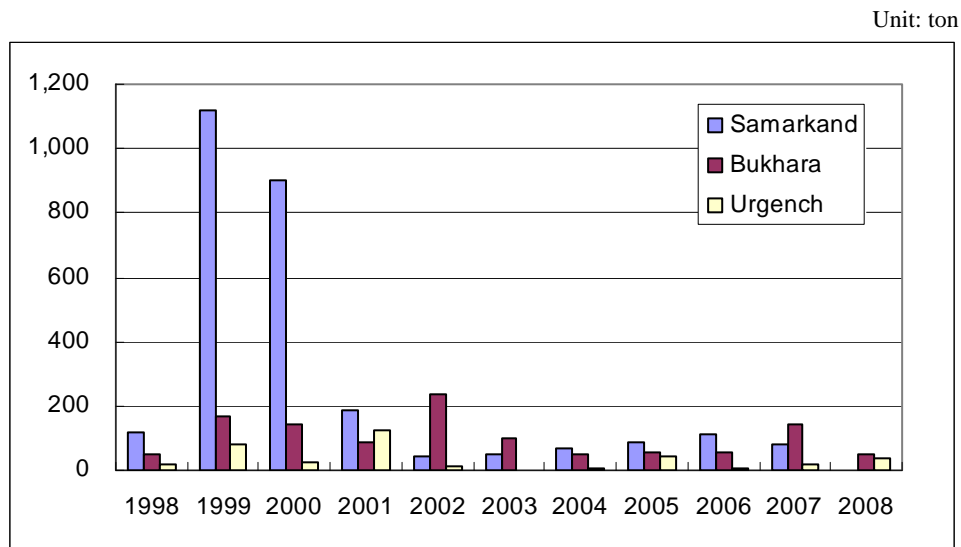
Although it cannot be seen clearly from the figures, however, staff at Bukhara Airport says that they have appreciated side-effects on the regional economy. For example, spare parts and equipments required at oil refineries and other plants near Bukhara can be imported directly

⁸ There is only a limited number of inter-city flights in Uzbekistan. Basically people have to go through Tashkent in order to move to other cities. There is a flight that runs Urgench – Bukhara – Tashkent on the timetable, however, it is often cancelled because of a lack of passengers.

⁹ Exchange rate 1sum= €0.0004720 (interbank rate as of July 29, 2009)

¹⁰ Cargo will be dealt with intensively at Navoi Airport. A Special Economic Zone has been constructed around Navoi Airport and the plan to construct an international logistic center at the airport is being carried out.

from other countries without going through Tashkent as Boeing cargo jets can land and take off at Bukhara Airport following modernization.



Source: Uzbekistan Airways

Figure 12: Trends in cargo volume

2.1.3.2 Environmental and Social Impact

At the time of the ex-post monitoring, there had been no reports of problems due to air or noise pollution during project implementation or in connection with the subsequent operation of the various airport facilities. At the time of the ex-post monitoring, no problem was reported. According to Uzbekistan Airways, the environment is improving from year to year due to the transition from soviet propeller aircrafts to jets such as Boeing and Airbus in compliance with ICAO standards.

2.1.3.3 Other Impacts

The following impacts were also recognized at the time of the ex-post monitoring; (1) benefit to local residents, (2) improvement in work efficiency for airport staff, and (3) improvement in the motivation of airport staff.

(1) Benefit to local residents

The number of local residents taking flights in order to visit relatives and work in Russia is increasing. For instance, the number of international arrivals at Samarkand Airport in 2008 was 78,198 in total and the number of tourists was 2,000. It can be estimated that more than 75,000 peoples went to Russia from Samarkand Airport on international flights. Since there were only approximately 13,000 users in 2003, this illustrates that the number of local users of the airport have increased markedly during the past five years. Airport staff indicates that one of the causes of this increase in users is that people can save time and money as they no longer need to go

through Tashkent.

(2) Improvement in work efficiency for airport staff

Some airport staff commented that operational efficiency also improved as the work environment improved through the modernization of the airport control towers. A further comment was that the modernization had made it easier for staff to operate and maintain facilities. It can thus be seen that the Project has contributed to improvement in work efficiency for airport staff to a certain extent.

(3) Improvement in the motivation of airport staff

After the ex-post evaluation, each airport won international prizes for their operation. For example, Bukhara Airport won a prize for the best airport in CIS countries in 2008. Samarkand Airport won a similar prize. Urgench Airport won a gold prize from the European Fund for Business Practice (FEBP)¹¹. This resulted in improvement in staff motivation. Some staff said that they took pride in working at the airport.

2.2 Sustainability

No problem was seen regarding the structural aspects, human resource aspects, technical aspects nor regarding the current status of operation and maintenance. As for the financial status, concerns were pointed out at the time of the ex-post evaluation, and expenditure continued to exceed income in Bukhara Airport and Urgench Airport. However, there is no problem with the budget for operation and maintenance since according to Uzbekistan Airways, headquarters cover the shortfall from their own budget.

2.2.1 Operation and Maintenance Agency

2.2.1.1 Structural aspects of Operation and Maintenance

The structure of operation and maintenance has not changed since the ex-post evaluation. Uzbekistan Airways is responsible for everything from airport construction, operation and management, through air transport services and the licensing of airline companies. In addition, Air Administration of the Republic of Uzbekistan exists as a supervisory authority over both the civil and the military aviation sectors. Air Administration is responsible for regulation and supervision over the complete aviation sector including Uzbekistan Airways.

Operation and maintenance of equipment at each airport is carried out by the department responsible for the provision of electricity and light. Operation and maintenance of the runways at each airport is undertaken by the department responsible for ground operations. Special departments for the procurement of spare parts required daily are set up at each airport, and they supply them without delay¹².

¹¹ This organization recognized the business practiced by the airport and the effective management system they have. They also noted the status of the airport as an international airport that complies with ICAO standards.

¹² Headquarters are responsible for procurement for major civil works and expensive equipment.

2.2.1.2 Technical aspects of Operation and Maintenance

According to Uzbekistan Airways, manuals for the equipment procured by the Project still existed at the time of the ex-post monitoring. Guidelines for the operation and maintenance of airport facilities have also been drawn up. Operation and maintenance of airport facilities are basically conducted in line with these guidelines. These, together with guidelines for the handling of hazardous materials and guidelines for handling general cargo are revised annually in accordance with ICAO recommendations.

There are sufficient spare parts in stock and no problem was observed at the time of the ex-post monitoring.

According to Uzbekistan Airways, engineers working on operation and maintenance of airport facilities were trained in Western Europe. There is no problem in sustainability in terms of personnel or technical capacity.

2.2.1.3 Financial aspects of operation and Maintenance

It is difficult to make a definite statement on whether or not the financial status is sound as financial data provided by Uzbekistan Airways does not come in the form of balance sheets but in records of cash flow. According to Uzbekistan Airways, however, there is no problem with the budget for operation and maintenance since headquarters cover the shortfall from their own budget, should the airport budgets run short.

At the time of the ex-post evaluation, all three airports had been constantly in deficit between 1995 and 2002 and excesses were covered by payouts from Uzbekistan Airways. However, surpluses at Samarkand Airport have been recorded since 2006 due to income from passengers and the sale of fuel which has been increasing due to this increase. Urgench Airport is expected to improve its balance of payment following the establishment of services between Urgench and Paris, Rome and Milan in 2010.

Table 7: Cash Flow Status of the three airports

Unit: Sum

		2000	2001	2002	2003	2004	2005	2006	2007	2008
Samarkand	Income	338,077	406,573	433,175	1,666,265	3,054,639	4,718,619	6,617,328	9,375,494	16,369,600
	Expenditure	472,779	607,820	565,997	2,176,179	3,118,778	4,952,954	5,891,779	8,929,573	14,145,684
	Balance	-134,702	-201,247	-132,822	-509,914	-64,138	-234,336	725,549	445,922	2,223,916
Bukhara	Income	315,036	514,743	700,425	1,470,549	2,014,164	2,020,867	4,480,924	7,220,359	11,062,096
	Expenditure	376,902	526,722	604,197	1,917,562	2,776,259	4,061,864	4,437,510	7,775,751	11,881,981
	Balance	-61,866	-11,979	96,228	-447,014	-762,095	-2,040,997	43,414	-555,393	-819,885
Urgench	Income	301,773	419,481	517,916	1,321,108	1,726,785	1,753,510	2,902,531	4,669,903	6,824,052
	Expenditure	290,233	447,548	614,485	2,085,681	2,444,186	4,193,714	3,412,839	6,188,008	8,147,303
	Balance	11,540	-28,067	-96,569	-764,574	-717,401	-2,440,204	-510,308	-1,518,105	-1,323,251

Source: Uzbekistan Airways

2.2.2 Current status of Operation and Maintenance

No problem is observed in the current status of operation and maintenance. In addition to daily checks on the runways, at Bukhara Airport and Urgench Airport where there are inclement weather conditions, major checkups and repairs with bitumen are conducted every spring and autumn. All three airports were credited with “satisfactory conditions” when the roughness of runways were checked in an inspection conducted by the Moscow Scientific Institute in 2006.

Airport facilities and equipment other than runways are well maintained, based on guidelines in compliance with ICAO standards, and they are in a very good condition.

Photo 1 : Repairs with bitumen



3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

Although, at the time of the ex-post evaluation, some concerns about effectiveness were pointed out due to the declining number of passengers since 1998/1999, this number has dramatically increased at each airport since 2006. This increase in effectiveness is remarkable in comparison with the results of the ex-post evaluation. Regarding sustainability from the financial aspect, expenditure has continuously exceeded income at Bukhara Airport and Urgench Airport, although a tendency to improve has been observed in Samarkand. However, there is no problem with the budget for operation and maintenance since headquarters cover the shortfall from their own budget, if the airport budgets run short. Uzbekistan Airways has made efforts to establish flights going through Samarkand or Bukhara for international flights between Tashkent and CIS countries and to have meetings with the concerned parties in order to revise timetables for the tourist season. However, this has not sufficiently reflected the needs of passengers according to the beneficiary survey and interviews with travel agencies.

3.2 Lessons Learned

An intended outcome of the project was the promotion of tourism development as the project sites are located in tourist spots. However, buses or railways have usually been used for tourists because of their convenience and the short distances involved. The number of tourists has been affected by international affairs but it is has been difficult to discern a relationship between modernization of the airports and tourism development. Therefore, if the promotion of tourism development is set as an outcome of projects involving construction or rehabilitation of airports, a consideration is necessary as to whether the airport is closely related to a tourist area and whether air transportation is predominant over other modes of transportation.

3.3 Recommendations

[To the Executing Agency]

While the modernization of the airports has been appreciated by travel agencies and passengers, problems with services such as baggage handling and staff attitudes toward passengers at customs control and passport control have also been pointed out. Further training is necessary to improve this service. Moreover, efforts towards the provision of more flexible services in response to passengers' needs towards the improvement of balance sheets are to be expected.

Comparison of the Original and Actual Scope

Item	Original	Actual
1. Project Outputs	<u>Samarkand Airport</u> 1)Civil work 2)Construction work -New passenger terminal -New cargo terminals 3)Air traffic control equipment <u>Bukhara Airport</u> 1)Civil work 2)Construction work -New passenger terminal -New cargo terminals 3)Air traffic control equipment <u>Urgench Airport</u> 1)Civil work 2)Construction work -New passenger terminal -New cargo terminals 3)Air traffic control equipment	As planned As planned Not constructed As planned As planned Rehabilitated existing terminal Not constructed As planned As planned As planned Not constructed As planned
2. Project Period (for all 3 airports)		
Phase I	June 1997 – Aug. 1999	Mar. 1997 – June 2000
Phase II	Oct. 1999 – Sep. 2000	June 2000 – Dec. 2001
3. Project Cost		
Phase I		
Foreign currency	15,526 million yen	15,036 million yen
Local currency	1,762 million yen	1,517 million yen
Total	17,288 million yen	16,552 million yen
Japanese ODA loan portion	15,526 million yen	15,036 million yen
Exchange rate	1 sum = 2.868 yen (June 1996)	1 sum = 2.092 yen (Phase I contract period average)
Phase II		
Foreign currency	2,795 million yen	2,786 million yen
Local currency	77 million yen	0 yen
Total	2,872 million yen	2,786 million yen
Japanese ODA loan portion	2,871 million yen	2,786 million yen
Exchange rate	1 sum = 0.740 yen (Nov. 1999)	

Kazakhstan

Ex-post Monitoring of Completed ODA Loan Project
“Railway Transport Capacity Development Project”

External Evaluator: Naomi Murayama
(OPMAC Corporation)
Field Survey: Sep.-Oct., 2009

1. Project Description



Map of the project area



Almaty Passenger Coach Repair Plant

1.1 Project Objective

The objective of this project was 1) to rehabilitate the track on the Aktogay – Druzhba route, which links the Kazakhstan and China railway systems, as well as to change the route, 2) to increase the trans-shipment capacity of Druzhba Station on the Kazakh – China border, and 3) to build a new railway-carriage repair plant at Almaty. This was to be achieved by a) increasing transport capacity and improving safety on the route, 2) responding to an increased demand for passenger transport, and 3) strengthening the deficient rolling stock repair and maintenance capacity, enhancing safety, and thereby contributing to the trade promotion and to economic development in Kazakhstan.

1.2 Outline of the Loan Agreement

Loan Amount/Disbursed Amount	7,236 million yen / 7,157 million yen
Loan Agreement/Final Disbursement Date	Dec.1995 / May 2001
Ex-post Evaluation	FY 2003
Executing Agency	Republic of Kazakhstan /Kazakhstan Temir Zholy (KTZ)
Main Contractor	Chori (Japan)
Main Consultant	Japan Railway Technical Service (Japan)

1.3 Background of Ex-post Monitoring

At the time of the ex-post evaluation, passenger turnover was at a lower level than that at the commencement of the project. The operation rate of the Almaty Passenger Coach Repair Plant, hereafter ACRP, also remained low, with repair performance falling far short of design capacity, especially in respect of depot repairs. Thus, issues related to effectiveness could be clearly seen. There were also concerns that some of the equipment procured under the project were in a poor state, having neither guarantees nor instruction manuals, and that the policies of the Kazakhstan government had the potential to impact on the sustainability of the project by separating the most profitable cargo traffic division from the secondary passenger traffic division under railway sector restructuring.

Therefore, this project was selected for ex-post monitoring and each criterion was reviewed with the findings from the field survey and other research activities. The conclusion was then drawn.

2. Monitoring Results

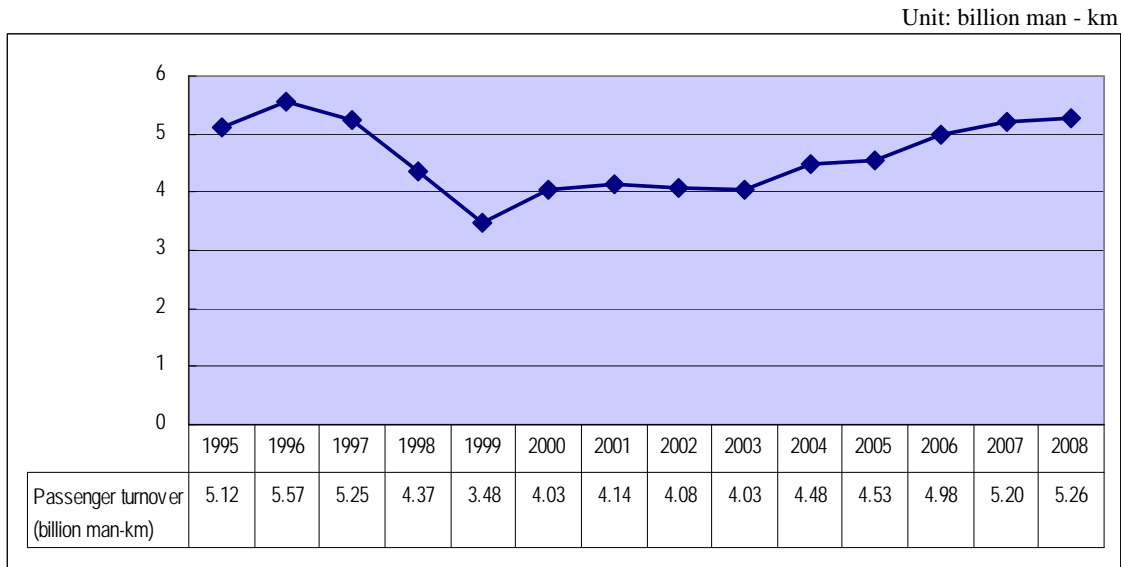
2.1 Effectiveness (Impact)

Passenger turnover, which had remained at a lower level than at the commencement of the project, increased little by little until it recovered the same level as at commencement. ACRP, which was failing to meet performance targets, remained much below design capacity. However, a number of relatively major repairs have been reported, while it had no record of major repairs at the time of the ex-post evaluation.

2.1.1 Current Facilities Operating Conditions and Effectiveness

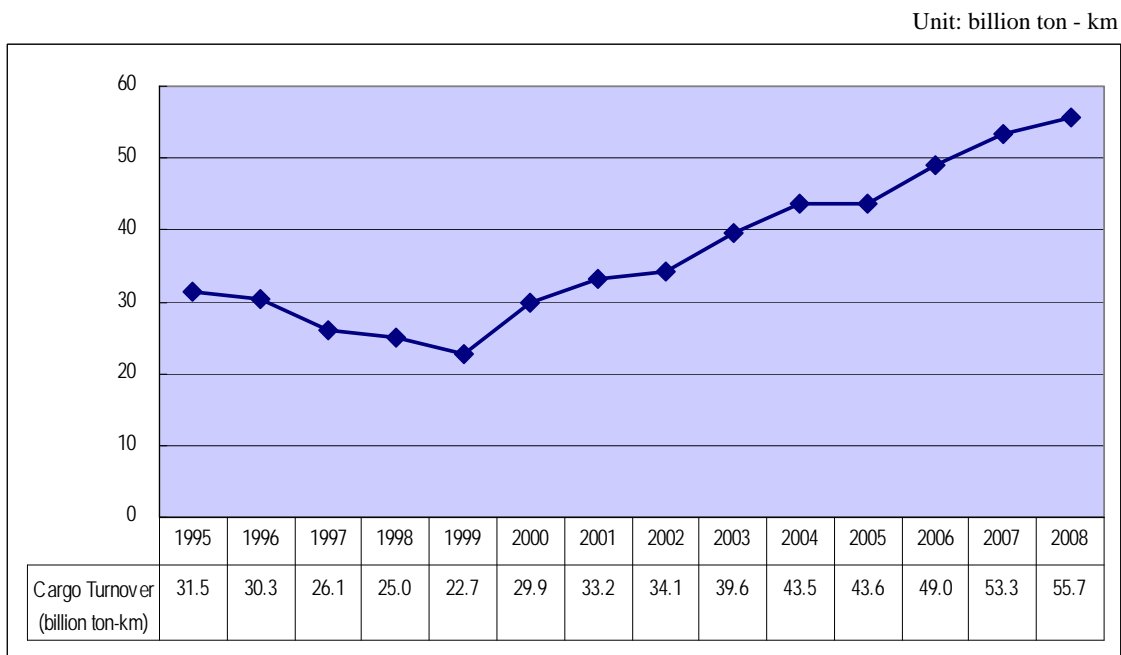
(1) Strengthening Rail Transport Capacity

Figure 1 shows passenger turnover on the Almaty-Aktogay-Druzhba route (the former Almaty route) between 1995 and 2008; cargo turnover for the same period is presented in Figure 2.



Source: KTZ

Figure 1: Passenger turnover on the former Almaty route



Source: KTZ

Figure 2: Cargo turnover on the former Almaty route

Passenger turnover was lowest in 1999 and at the time of the ex-post evaluation it remained at around 4 billion man-kilometers level. Since 2003, however, it has gradually increased recovering the same level as at commencement. Cargo turnover has increased considerably, due to the activation of trade between Kazakhstan and China.

Table 1: Passenger and Cargo Trains on the Aktogay-Druzhba route¹ (2003-2008)

Unit: train/week

	Number of passenger services ²	Number of cargo services
2003	16	58
2004	16	119
2005	16	145
2006	16	169
2007	16	156
2008	18	170

Source: KTZ

The number of passenger train services and the number of cargo train services are shown in Table 1. The former has been stable since the time of the ex-post evaluation, 2003 to 2007, but a new service between Astana and Urumqi started on May 27, 2008. Since then, the number has become eighteen per week. On the other hand, the number of cargo train services has been increasing year after year together with the activization of trade between Kazakhstan and China.

Table 2: Journey Times on the Aktogay-Druzhba³

Unit: hour: minute

	Aktogay-Druzhba route		
	Regular services	Express services	Cargo services
2003	8:24	6:18	8:02
2004	8:24	6:12	8:28
2005	8:24	6:01	8:45
2006	8:20	6:01	8:12
2007	7:20	6:01	8:00
2008	6:00	5:41	7:57

Source: KTZ

Following the ex-post evaluation, the required time of passenger services (regular services and express services) as well as cargo services has reduced year to year (Table 2). For instance, the required time for regular passenger services in 2008 had reduced by 28 % from that in 2003. According to a person in charge at KTZ, the top speed of cargo rail services has improved from 60 km/h to 80 km/h through re-routing and the improvement of communication equipment under the project as well as by track rehabilitation carried out by their separate funds in 2007.

¹ The number of railway services includes both the number of services from Aktogay to Druzhba and from Druzhba to Aktogay.

² Services between Aktogay and Druzhba have been provided by JSC Passenger Transportation since 2007. JSC Passenger Transportation is a sister company established in 2002 as a division of the national railway of Kazakhstan.

³ As the data provided by KTZ is significantly different to the data at the time of the ex-post evaluation, there is no comparison with figures predating the ex-post evaluation in this report. The data in this table illustrates the required time shown in the timetable and it is not necessarily consistent with the actual service time.

Table 3: Number of accidents on the Almaty Railway Route (2003-2008)⁴

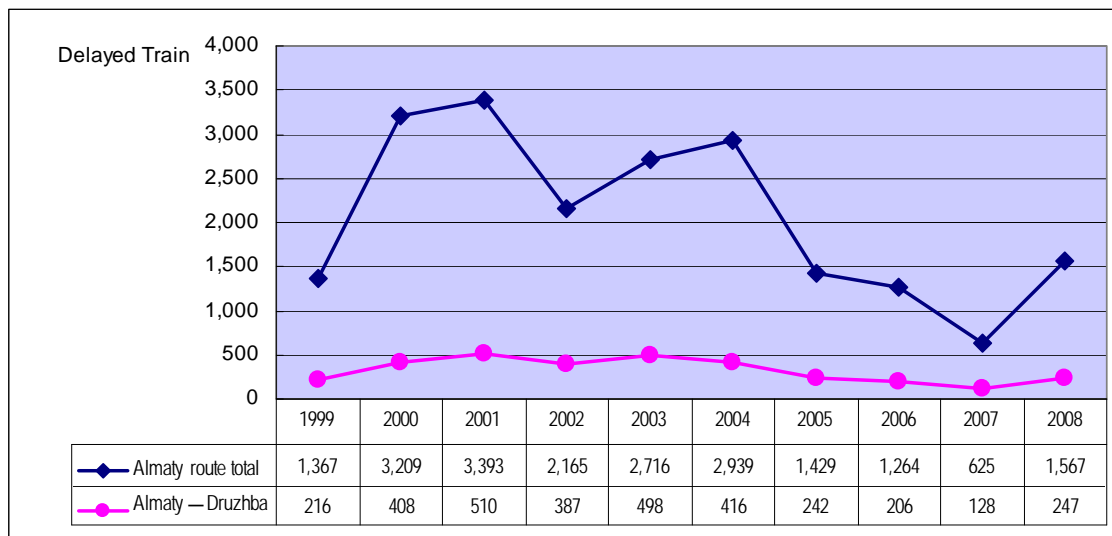
Unit: case

	Number of derailments	Number of fatalities	Number of breakdowns	Total number of accidents
2003	6	0	0	115
2004	3	2	0	101
2005	4	0	1	103
2006	3	1	0	77
2007	6	0	0	67
2008	2	1	0	73

Source: KTZ

The total number of accidents has continuously decreased. KTZ highly appreciates the improvement of safety of train services through re-routing. From the number of derailments and fatalities seen in Table 3, however, a causal link between the improvement in safety and the implementation of the project cannot be confirmed.

Unit: train



Source: KTZ

Figure 3: Number of delayed trains

According to KTZ, there was no record of cancellations on any of the Almaty Railway Routes or on the Almaty-Aktogay-Druzhba route between 1999 and 2008. Figures for delays are shown in Figure 3. However, a causal linkage between the number of delays and or cancellations and the implementation of the project cannot be confirmed.

⁴ The total number of accidents at the time of the ex-post evaluation included derailments, fatalities, breakdowns and thefts. However, the data provided by KTZ included 31 kinds of accidents including derailments, breakdowns, accidents during maintenance etc. (it did not include fatalities and thefts.)

(2) Trans-shipment Capacity of Druzhba Station

Table 4 shows the annual trans-shipment performance of workshops No. 2 and No. 3 at Druzhba Station where forklifts procured by the project are located together with trans-shipment times per cargo train.

Table 4: Forklift Trans-shipment capacity and performance at Druzhba Station (2003-2008)⁵

	Annual trans-shipments (Unit: thousand ton)	Trans-shipment time per cargo train (Unit: hour: minute)
2003	220.7	32:09
2004	295.8	24:03
2005	371.8	19:05
2006	762.1	9:19
2007	1,292.8	5:29
2008	1,399.1	5:05

Source: KTZ

The annual trans-shipment performance at Druzhba station has increased since 2003 together with the activation of trade between Kazakhstan and China, as shown in Figure 2. Trans-shipment time per cargo train has decreased substantially since 2003. According to KTZ, trans-shipment time was reduced by less than one sixth, despite a 6.3 times increase in cargo volume. This was because it was no longer necessary to do the work manually thanks to the introduction of forklifts procured under the project. From this standpoint, the efficiency of the project can be confirmed.

(3) Improved Railway Carriage Repair Capacity

Table 5 illustrates the repair performance of ACRP from 2003 to 2008 and Figure 4 shows a comparison of the design capacity⁶ with repair performance during the same period.

At the ex-post evaluation, the KR-1 rate was 10-69 % and KR-2 rate was 0% in comparison with the planned design capacity at the time of appraisal (KR-1: 300 carriages per year, KR-2: 70 carriages per year). Since 2003, the plant has had a better record, for example the KR-2 rate is 0-21 carriages. Moreover, there are records of major repairs such as Capital Repairs with Lifespan Expansion (KRPS) and Capital Repairs and Renewal (KVR) for the last three years. However, orders for dept repairs and KR-1 have been decreasing for the last several years.

⁵ The trans-shipment performance in this table includes performance not only of forklifts procured under the project but also of other forklifts procured by KTZ out of their own funds, together with manual works. As the data provided by KTZ is significantly different to the data at the time of the ex-post evaluation and it can be considered to have adopted different base, there is no comparison with figures pre-dating the ex-post evaluation in this report. For example, the annual trans-shipments performance in 2002 was 800 thousands ton and the trans-shipment time per cargo train in the same year was 9 hours in the ex-post evaluation report.

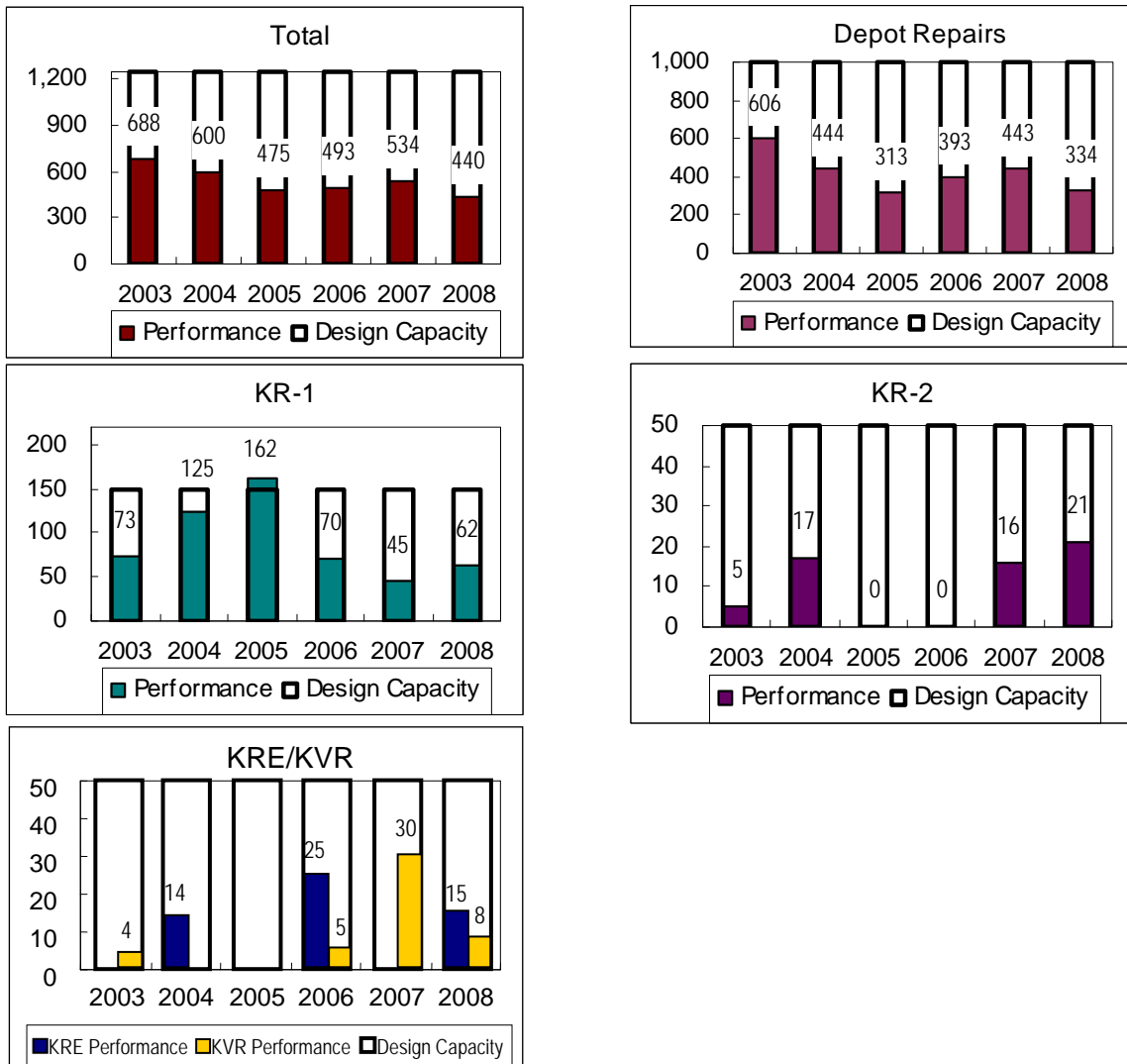
⁶ There is a plan for the plant to start to assemble new coaches from 2010 and at the time of the ex-post monitoring, this is in a preparatory stage. However, the design capacity shown in Figure 4 is consistently the design capacity at completion of the project.

Table 5: Repair Performance of ACRP (2003-2008)

Unit: carriage

	2003	2004	2005	2006	2007	2008
Depot Repair	606	444	313	393	443	334
KR1 (scheduled repairs per 5 years)	73	125	162	70	45	62
KR2 (scheduled repairs in 20 years)	5	17	0	0	16	21
KRPS ⁷ (Capital repairs with lifespan expansion)	0	14	0	25	0	15
KVR ⁸ (Capital repairs and renewal)	4	0	0	5	30	8
Total	688	600	475	493	534	440

Source: KTZ



Source: Based on documents provided by KTZ

Figure 4: Comparison of Design Capacity and Repair Performance

⁷ KRPS (Capital Repairs with Extension of Lifespan) is executed in volumes of KR-1 or KR-2 depending on the technical conditions of the carriages. These are undertaken 28 years after coach construction.

⁸ KVR (Capital Repair and Renewal) is repair of carriages using restored existing parts of the body and wheels, the rehabilitation of internal equipment, the improvement of interiors and scheduled repairs executed in accordance with the requirements of technological normative documents. These are undertaken not earlier than 20 years after construction.

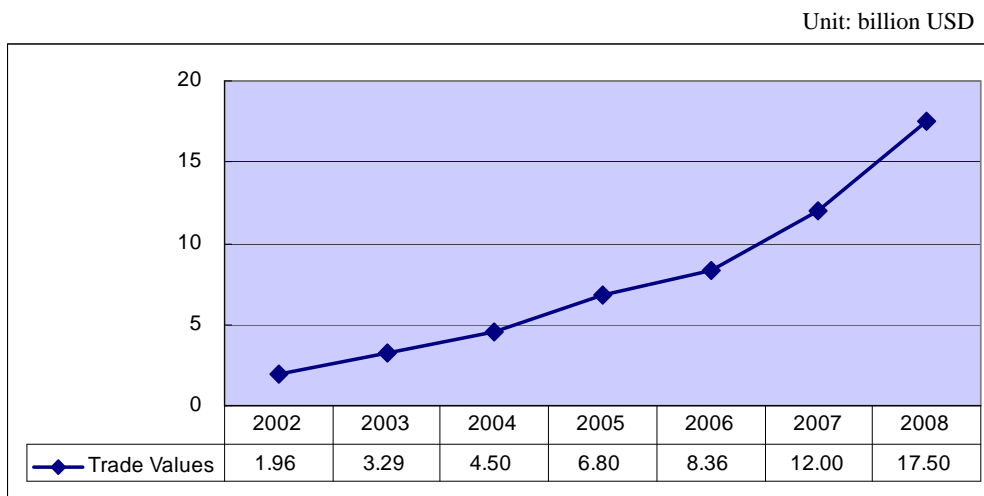
2.1.2 Results of Economic Internal Rate of Return

Due to the fact that the EIRR was not calculated and the benefit was not clearly set at the time of appraisal and the ex-post evaluation, a comparison cannot be made.

2.1.3 Impact

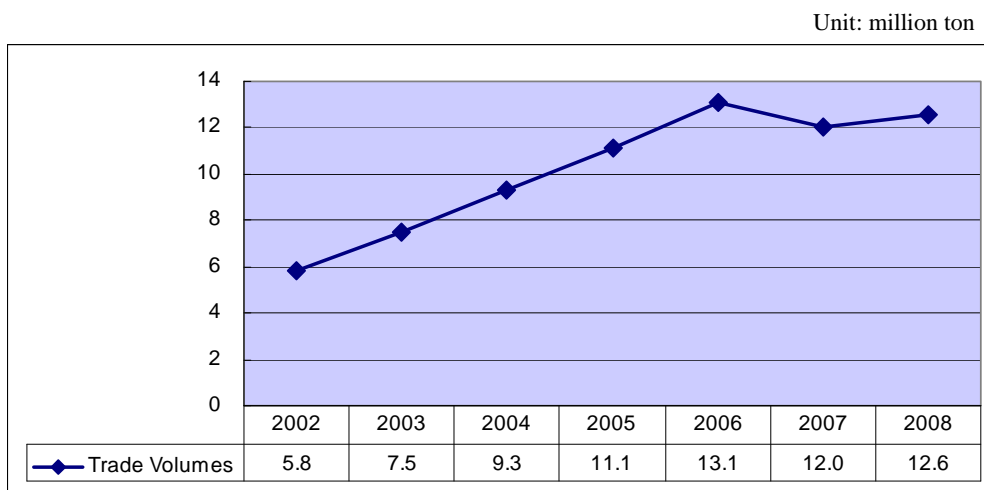
(1) Expanded Kazakhstan-China Trade and Rail Traffic Volumes

Figure 5 shows trade values between Kazakhstan and China from 2002 to 2008. Figure 6 illustrates trade volumes between Kazakhstan and China via Druzhba Station during the same period.



Source: KTZ

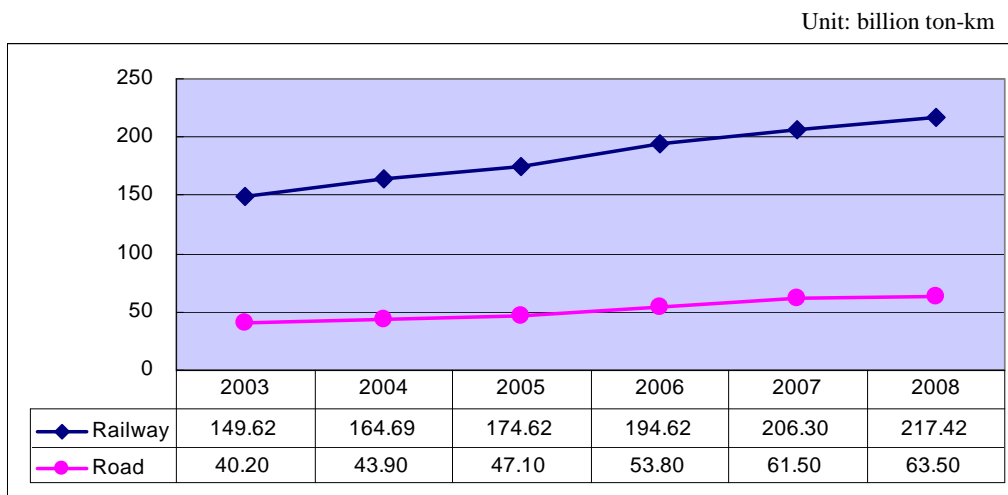
Figure 5: Trade Values between Kazakhstan and China



Source: KTZ

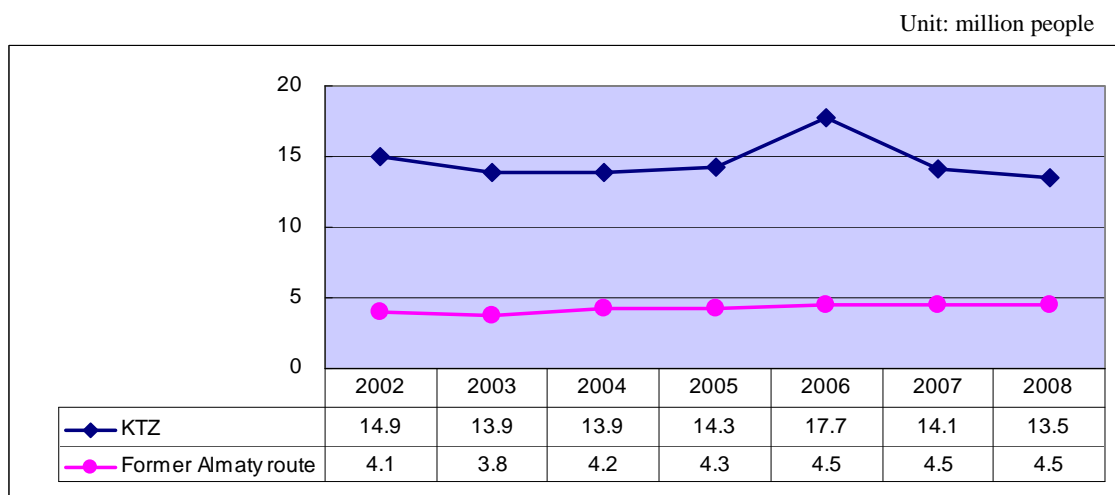
Figure 6: Trade Volumes between Kazakhstan and China (via Druzhba Station)

Trade values have been steadily rising since 2002. The volume in 2008 had increased 1.68 times compared to the volume at the time of the ex-post evaluation in 2003, although there had been stagnation since 2006. According to staff at Druzhba station, the trade volume from China had decreased especially after 2008 due to the world economic crisis. Meanwhile, the “Transport Strategy of the Republic of Kazakhstan to 2015” (approved in 2006) aims to expand transit trade as Kazakhstan is located at a key trading junction between Asia and Europe. Since the only gateway for Asian railway trade is Druzhba station and as the railway cargo turnover greatly exceeds the road cargo turnover (as indicated in Figure 7), the strategy is to develop railway transportation and Druzhba station in order to attain the goal of expanded transit trade. The target volume of trade through Druzhba station for 2015 is 25 million tons.



Source: KTZ

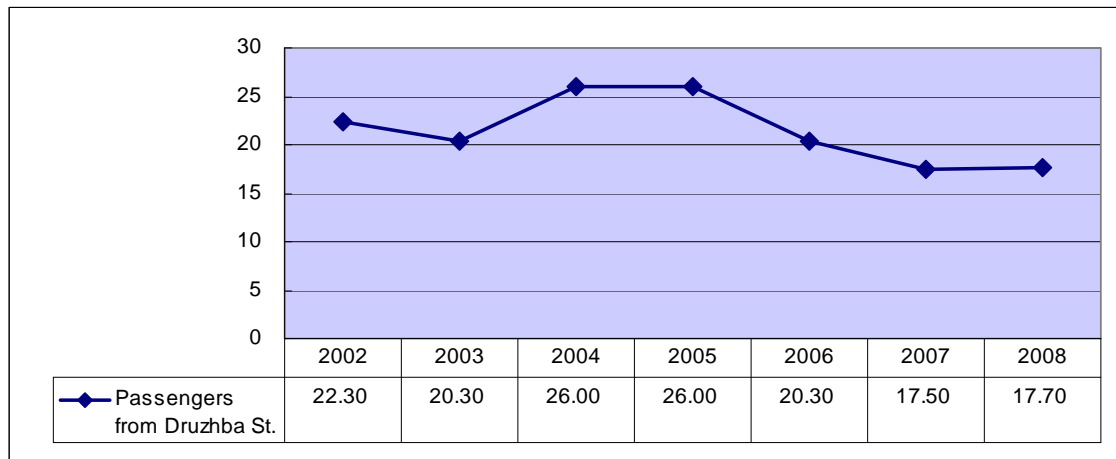
Figure 7: Rail and Road Cargo Turnover (nationwide)



Source: KTZ

Figure 8: Number of passengers using KTZ and Almaty Railway routes

Unit: thousand people



Source: KTZ

Figure 9: Number of Passengers using Druzhba Station on the Kazakh-China border

The number of passengers, as shown in Figure 8, has remained stagnant. While the number of passengers using Druzhba station⁹ increased temporarily in 2004 and 2005, there is now a declining trend.

(2) Environmental and Social Impact

At the time of the ex-post evaluation, no problems had been reported in connection with the land acquisition and involuntary resettlement components of this project. According to KTZ, there is also no negative environmental impact. KTZ agreed that the construction of the detour around Lake Alakol has contributed to the alleviation of pollution risks which would be present when the train passed over the lake.

2.2 Sustainability

At the time of the ex-post evaluation, there was inadequate management of some equipment procured under the project because some guarantees and instruction manuals were missing. This problem has now been solved by requesting them from suppliers. There were concerns that the policy of the Kazakhstan government had the potential to impact on the sustainability of the project through the separation of the most profitable cargo traffic division from the secondary passenger traffic division under railway sector restructuring. In fact, this has had no effect on sustainability from the view point of operation and maintenance since KTZ subsidizes the passenger traffic division.

⁹ At the time of the ex-post monitoring, the number of users at Druzhba station was the total number of passengers boarding a train at the station.

2.2.1 Operation and Maintenance Agency

2.2.1.1 Structural aspects of Operation and Maintenance

The organization of operation and maintenance is as follows:

- 1) Tracks in the project area: KTZ Department of Mainline Network
- 2) Communication equipment: KTZ Department of Communication
- 3) Trans-shipment workshop at Druzhba station: KTZ Directorate of Transportation Process, Kaztransservice¹⁰
- 4) Trans-shipment work: Kaztransservice、Kedentransservice¹¹
- 5) Almaty Passenger Coach Repair Plant: Almaty Passenger Coach Repair Plant¹²

Trans-shipment work has been contracted out to the above two companies since 2005 and forklifts procured under the project have been also leased out to Kedentransservice for the long term.

2.2.1.2 Technical aspects of Operation and Maintenance

At the time of the ex-post evaluation, the following three problems with operation and maintenance were indicated; 1) inadequate management of some equipment, 2) lack of skilled engineers, and 3) delays in the supply of spare parts. These problems were confirmed at ACRP in the site survey.

Regarding missing guarantees and instruction manuals, ACRP requested that they be provided from suppliers. This has been achieved and now there are no problems with equipment operation.

As for the lack of skilled engineers, ACRP has made efforts to enhance external training¹³ and training courses at the plant and to improve the work environment for engineers and other specialists who take training courses. ACRP provides the following kinds of training courses: four months intensive training targeting people who did not graduate from vocational school; training courses for new recruits; annual or quarterly training programs for specialists; lecture courses called “Academic Hours” held every Friday, and basic training courses through on the job training (OJT). At the end of annual or quarterly training programs for specialists, tests are implemented by the Examination Committee, and the results of these are reflected in staff

¹⁰ A KTZ sister company responsible for trans-shipment.

¹¹ A private company providing similar services to Kaztransservice.

¹² KTZ has owned 100% of the shares of ACRP since September, 2009. Before that, KTZ and JSC Passenger Transportation owned a 50 % share each. According representatives of the plant, KTZ took 100 % ownership in order to strengthen repair capacity.

¹³ Staff have participated in the following training courses held in the Ukraine, Russia, Egypt and elsewhere since 2006:

2006: Courses for managers of metallurgical services (responsible for measurements) 2007: Principles of functioning and improvement of integrated enterprise management systems; Introduction to and understanding of ISO compliant quality management systems; Development of Enterprise QMS, the European experience of improvement; Regulation of state procurement; Labor protection and labor safety 2008: Labor protection and labor safety; Regulation of state procurement; Technology for the assembly of passenger coaches

grades and salaries. There is therefore an incentive for specialists to improve their skills. As a result of the implementation of systematic and continuous training courses like those described above, problems with the technical aspects of repair works have been solved. However, according to a skilled engineer who is in charge of lectures, at present there is only one chief engineer who can teach repair techniques. From the view point of sustainability therefore, training for trainers is an urgent issue.

The number of staff at ACRP is shown in Table 6¹⁴.

Table 6: Number of staff at ACRP

Unit: person

	2003	2004	2005	2006	2007	2008
Executives	4	4	4	4	4	4
Administration	29	27	31	30	30	30
Engineers	129	95	83	86	88	91
Other specialists	892	731	544	597	645	698
Total	1,054	857	662	717	767	823

Source: KTZ

The problem of delays in spare parts supply has been solved since 2005 through by-passing the complicated procurement process. An electric inventory system has also been introduced, which not only reviews stock every three months, but also procures in accordance with an annual schedule for use.

2.2.1.3 Financial aspects of Operation and Maintenance

KTZ has compiled consolidated financial statements based on international accounting standards since 2002 (Table 7, Table 9). Besides these, separate financial statements (Table 8, Table 10) have been compiled since 2004.

Table 7: consolidated income statements

Unit: million USD

	2004	2005	2006	2007	2008
Revenue	1,886	2,140	3,034	3,466	4,021
Operating income/loss	-92	-62	368	367	405
Net income/loss	-93	-129	178	209	531

Source: KTZ

Table 8: KTZ separate income statements

Unit: million USD

	2004	2005	2006	2007	2008
Revenue	1,720	1,879	2,644	2,993	3,543
Operating income/loss	-65	380	291	221	225
Net income/loss	-79	-66	142	116	347

Source: KTZ

¹⁴ The number of engineers and other specialists in 2008 was less than in 2003. According to ACRP, this was the result of layoffs in response to order decrees.

Table 9: consolidated balance sheets

Unit: million USD

	2004	2005	2006	2007	2008
Fixed assets	4,210	4,412	5,076	5,772	6,452
Current assets	763	609	1,231	1,346	1,224
Total assets	4,974	5,021	6,307	7,118	7,676
Long-term debts	409	407	1,437	1,597	1,463
Current liabilities	457	760	549	678	882
Total liabilities	866	1,167	1,986	2,275	2,345
Total liabilities and equity	4,974	5,021	6,307	7,118	7,676

Source: KTZ

Table 10: KTZ separate balance sheets

Unit: million USD

	2004	2005	2006	2007	2008
Fixed assets	3,170	3,264	3,552	3,953	4,288
Current assets	1,697	1,660	2,485	2,716	2,548
Total assets	4,868	4,924	6,037	6,669	6,836
Long-term debts	283	333	899	962	792
Current liabilities	442	632	715	840	866
Total liabilities	725	965	1,614	1,802	1,657
Total liabilities and equity	4,868	4,924	6,037	6,669	6,836

Source: KTZ

Table 11: Analysis of consolidated financial statements

Unit: %

	2004	2005	2006	2007	2008
ROA	-1.87	-2.57	2.82	2.94	6.92
Liability ratio	17.41	23.24	31.49	31.96	30.55
Current ratio	166.96	80.13	224.23	198.53	138.78

Source: KTZ

Table 12: Analysis of KTZ separate financial statements

Unit: %

	2004	2005	2006	2007	2008
ROA	-1.62	-1.34	2.35	1.74	5.08
Liability ratio	14.89	19.60	26.74	27.02	24.24
Current ratio	383.94	262.66	347.55	323.33	294.23

Source: KTZ

At the time of the ex-post evaluation, it was concluded that KTZ had been posting steady increases in operating income and profits and, on the basis of analysis of the financial statements from 1999 to 2002, was a financially viable operation. According to analysis of the consolidated and separate financial statements for the last five years, Return on Assets (ROA) has been improving and the liability ratio (total liabilities/ total assets) and the current ratio (current assets/ current liabilities) are sound. No problems have been observed in profit performance and financial stability.

At the time of the ex-post evaluation, it was pointed out that the policy of the Kazakhstan government had the potential to impact on the sustainability of the project and thus it would be necessary to keep a close eye on the direction taken by reforms. According to KTZ however, there has been no effect on sustainability from the view point of operation and maintenance as KTZ subsidize the passenger traffic division.

2.2.2 Current status of Operation and Maintenance

During the ex-post monitoring, a site survey was conducted around Lake Alakol (the detour route), Aktogay station (for communication equipment), Druzhba station (trans-shipment equipment) and ACRP. The current status of facilities and equipment procured under the project was verified there.

The detour route is maintained well without inundation and no problems have been observed.

Under the project, commutation cables between Aktogay and Druzhba were improved. The department of communication at Aktogay station is responsible for operation and maintenance for these and according to the department, operation and maintenance is carried out using special equipment procured by the project. There are no major problems or breakdowns. Communication equipment has been replaced with optical fiber communication cables from October, 2009 and consequently equipment procured under the project will be used as back-up.

Eighteen forklifts were procured for Druzhba station. However, at the completion of the project, as the trans-shipment volume at the station was lower than originally thought, some of those equipments were transferred to other stations¹⁵. There are currently eight forklifts (of 1.5 tones) and one forklift (of 40 tones) at Druzhba station. These forklifts are leased out to Kedentransservis following a revision of the KTZ scope of work in 2005. According to Kedentransservis, the leased forklifts are presently not in use due to heavy use in the past and because 10 years has passed since procurement¹⁶.

With respect to ACRP, at present, all problems have been solved and there is no problem with operation and maintenance.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

Passenger turnover, although at a lower level at the time of the ex-post evaluation than at commencement, has increased little by little and has now reached the same level as the commencement level. The delays in spare parts supply at ACRP have been solved through direct procurement. ACRP engineer capacity is no longer a problem due to the implementation of systematic training for engineers and other specialists.

The trade volume between Kazakhstan and China increased up to 2008. In accordance with this, cargo volume also increased considerably. It can be seen that the project has contributed to the trade promotion by the increase in the volume of trans-shipments at Druzhba station and the reduction in trans-shipment time. It is, however, necessary to pay special attention to changes in trade volume, especially decreases, due to the influence of the world economic crisis.

3.2 Lessons Learned

None.

¹⁵ Stations where forklifts procured under the project are located: (not including Druzhba station) :
1.5 ton forklifts: Pavlodar station, Aktybinsk station, Zhinishke station, Astana station (1 each), Almaty station (3)
20 ton forklifts: Chimkent station (2)

¹⁶ KTZ does not plan to repair the forklifts as it is considered more reasonable to purchase new ones than to fix the present ones.

3.3 Recommendations

[To the Executing Agency]

- Some data collected in the site survey contained different figures and definitions to that collected at the time of the ex-post evaluation. For example, data on trans-shipment performance and times at Druzhba station is required for monitoring the effectiveness of the project. Therefore, it is desirable that a system is established whereby records are kept using the same definitions, not only for monitoring the effectiveness of the project but also for utilizing the data in daily operations.
- At the ex-post evaluation, problems were found in the technical level of engineers at ACRP. However, thanks to systematic and continuous training, the level of engineers and other specialists has been raised. Nevertheless, a lack of engineers to train successors remains a problem. From the view point of sustainability, training for trainers is an urgent issue. It is desirable to train trainers for full sustainability after the project completion.

Comparison of the Original and Actual Scope

Item	Original	Actual
1. Project Outputs - Track rehabilitation (Replacement of rails/sleepers, etc.) - Construction of alternate route - Communications equipment improvements (Installation of underground cables, replacement of telephone switching equipment, etc.) - Procurement of forklift trucks & other cargo transit equipment - Construction of railway-carriage repair plant - Consulting services	Beskol – Druzhba: 150km Concrete sleepers Lake Alakol area: approx. 22km Aktogay-Druzhba: approx.300km <u>Druzhba Station</u> 1.5-ton forklift trucks: 15 30-ton forklift trucks: 3 0.5-ton cranes: 2 Annual transit capacity: 1.135 mill. tons Almaty railway-carriage repair plant (20,000m ²) Foreign consultants: 30M/M Local consultants: 318M/M	As planned Wooden sleepers Lake Alakol area: 26.98km As planned <u>Druzhba Station</u> 1.5-ton forklift trucks: 15 30-ton forklift trucks: 2 40-ton forklift trucks: 1 Annual transit capacity: 1.025 mill. tons As planned Foreign consultants: 20M/M Local consultants: 400M/M
2. Project Period Track rehabilitation Alternate route construction Communications equipment improvements Trans-shipment equipment procurement Construction of new railway-carriage repair plant Consulting services	July 1996- June 2000 July 1996- June 2000 July 1996- Jan. 1998 July 1996- Jan. 1998 July 1996- June 2000 Jan. 1996- June 2000	June 1997- Dec.1999 June 1997- Dec.1999 June 1997- Dec.1999 June 1997- Jan. 1998 June 1997- Dec. 2001 Mar. 1996- Apr. 2001
3. Project Cost Foreign currency Local currency Total Japanese ODA loan portion Exchange rate	4,313 million yen 5,336 million yen 9,649 million yen 7,236 million yen USD 1= 106.25 yen (March 1994)	7,157 million yen 2,388 million yen 9,545 million yen 7,157 million yen KZT 1 = 1.61 yen (December 1996)