Republic of Uzbekistan

Ex-Post Evaluation of Japanese ODA Loan Project

"Tashguzar-Kumkurgan New Railway Construction Project"

External Evaluator: Hisae Takahashi, Ernst & Young Sustainability Co., Ltd.

0. Summary

This project was implemented for establishing a more reliable and efficient railway transport network by constructing a new line between Tashguzar-Kumkurgan and rehabilitating the existing line between Karshi-Tashguzar and thereby helping promote the socioeconomic development of the southern region. Uzbekistan has worked to strengthen transportation capacity and promotes railway development for sustainable growth, meaning this project has been highly relevant to Uzbekistan's development plan and needs. Implementing this project increased the volume of freight and passenger transport not only for target line but also the whole line in Uzbekistan, and also reduced transportation time and distance and improved railway services by enabling internal travel bypassing neighboring countries. The socioeconomic impact around the target lines was also observed. Although the efficiency of this project is fair as both the project period and cost exceeded the plan, the sustainability of the project effect is expected to be assured since the project lines are in good operational and maintenance condition and there are no concerns over institutional, technical and financial aspects on the part of the executing agency.

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

1. Project Description

Project Location

Constructed Bridge (Bridge No.5)

1.1 Background

Railways provide a dominant role in transportation of the Republic of Uzbekistan ("Uzbekistan"), which is a doubly landlocked country[1], and freight transport mainly comprises transportation of Uzbekistan Temir Yullari (Uzbekistan Railway, "UTY"). Since Uzbekistan played a role supplying natural resources and agricultural commodities under the regional specialization system of satellite

[1]A landlocked country surrounded by other landlocked countries. A person in such country has to cross at least two borders to reach a coastline.

countries during the Soviet era, part of its external transportation routes remained inside neighboring countries, such as railways, roads, and air routes. The customs clearance procedures at border crossings on these routes have often hindered efforts to enhance the certainty and efficiency of transportation.

The railway sector of Uzbekistan is regarded as an important component of economic infrastructure to develop the country and facilitate its transition toward a capitalist economy in the post-Soviet era. However, they were constructed as part of a network centering on Moscow during the Soviet era, meaning some routes are via neighboring countries as mentioned above, and have become obsolete. In addition, the facilities were deteriorated and needed to be refurbished or upgrade. Accordingly, there is a need for a swift response to construct a network of domestic route; to reduce transport cost and transport distance/time; to prepare for the increase in transport volume; and to enhance the reliability of railway transport. With that in mind, it was decided to construct a new rail line directly linking Kashkadarya and Surkhandarya provinces without traversing Turkmenistan and rehabilitating the existing railway line between Karshi and Tashguzar in Kashkadarya province with the assistance of Japan.

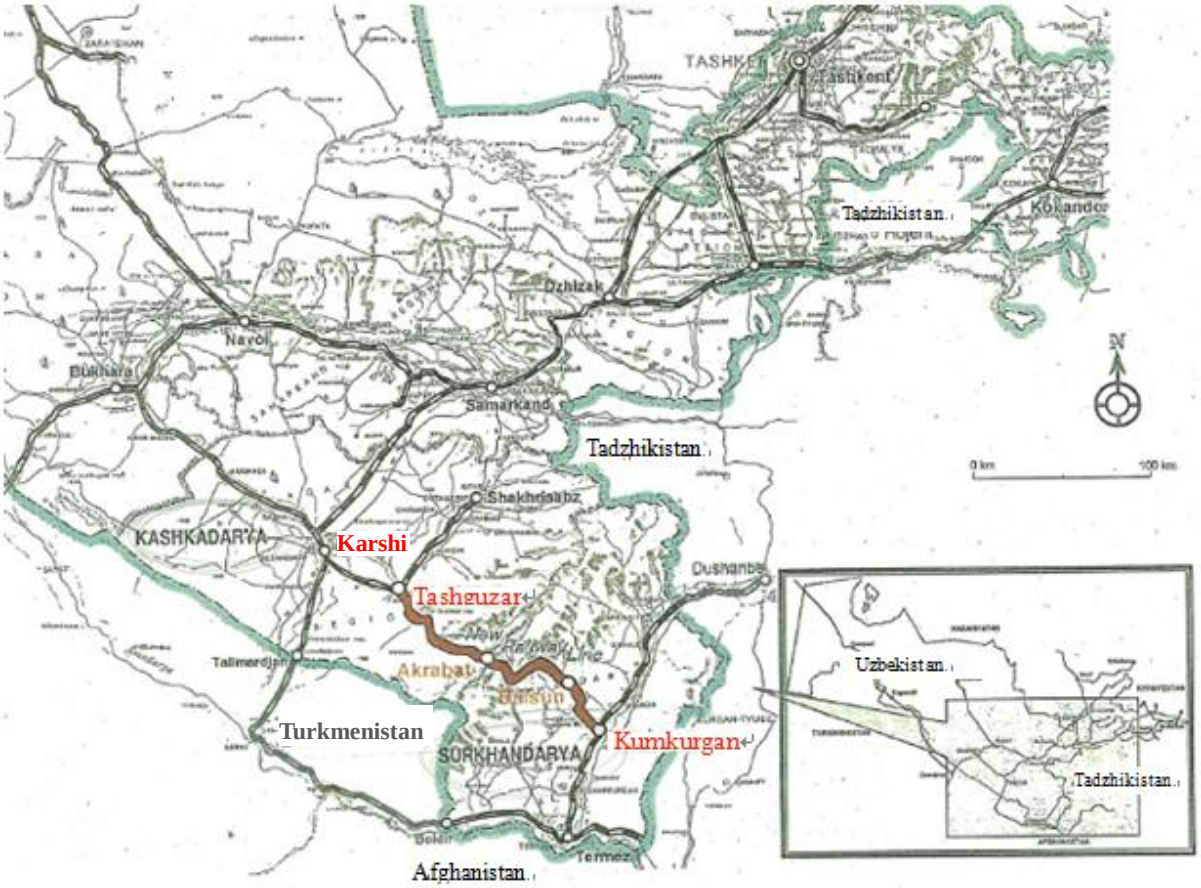

Figure 1 Railway network of Uzbekistan and the project line

1.2 Project Outline

The objective of this project is to establish a more reliable and efficient railway transport network by constructing a new railway line between Tashguzar and Kumkurgan as well as rehabilitating the

existing railway line between Karshi and Tashguzar, thereby helping promote the socioeconomic development of the southern regions (Kashkadarya and Surkhandarya provinces) of Uzbekistan.

Loan Approved Amount/ Disbursed Amount	16,359 million yen / 16,359 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	August, 2004/ October, 2004
Terms and Conditions	Interest Rate 0.4% Repayment Period 40 years (Grace Period) (10 years) Conditions for Procurement: Tied
Borrower / Executing Agency(ies)	The Government of the Republic of Uzbekistan / State Joint Stock Company Uzbekistan Temir Yullari (UTY)
Final Disbursement Date	February, 2012
Main Contractor (Over 1 billion yen)	Mitsui & Co., Ltd, Marubeni Corporation, Shimizu Corporation/ Nippon Steel Engineering Co., Ltd/ Yokogawa Construction Co., Ltd (JV)
Main Consultant (Over 100 million yen)	Japan Transportation Consultants, Inc. (JTC)
Feasibility Studies (F/S), etc.	"F/S for New Guzar–Baisun–Kumkurgan Railway Line Construction Project in Uzbekistan" JETRO, 2002 "Updated F/S for the New Guzar – Baisun –Kumkurgan Railway Line Construction Project in Uzbekistan" JTC, 2003
Related Projects	・(Technical Cooperation for Japanese ODA loan) "Capacity Development on Upgrading Track Maintenance and Train Operations Skills related to Tashguzar-Kumkurgan New Railway Line (2012-2013)" : Establishment of train operation and the improvement of cargo transport service ・(Japanese ODA Loan) "Railway Passenger Transport Improvement Project (L/A 1996)" : Construction of cargo-repair garage and purchase of new passenger carriage ・(Japanese ODA Loan) "Karshi-Termez Railway Electrification Project" (L/A February, 2012): Electrification of total extension of 325km including line between Tashguzar and Kumkurgan ・ADB "CAREC Corridor 6 (Marakand-Karshi) Railway Electrification Project" (Since February, 2012 in operation)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Ernst & Young Sustainability Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: August 2013 – August 2014

Duration of the Field Study: November 25 – December 11, 2013, April 4 – 11, 2014

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

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Uzbekistan

At the time of appraisal, Uzbekistan had not prepared a comprehensive development plan on a national level, although it had promoted economic reform for stable and sustainable economic growth and poverty reduction; identifying five priority issues, including modern and comprehensive infrastructure improvement. As for the railway sector, the lack of capacity and reliable transportation hindered smooth logistics in domestic routes, which involved detours via neighboring countries when transporting between neighboring domestic provinces. Accordingly, it was the most crucial issue to strengthen transportation capacity by restructuring routes with new line, rehabilitating new track lines, constructing a double track, and electrification.

At the time of ex-post evaluation, "Welfare Improvement Strategy (2012-2015)", the development policy of Uzbekistan, has promoted the "Reconstruction, upgrade, and modernization of rail infrastructure" as a top priority on the railway sector, acknowledging that the development of the transportation system is imperative for sustainable growth in both society and economy. Also, the Presidential Decree No. PP-1446 "To promote the development of infrastructure and transport and communications construction (2011-2015)", which include "development and modernization of railway" as one of the top ten priority issues, came into force in 2010 as a plan to develop the transportation infrastructure.

As described above, the government of Uzbekistan has prioritized projects of improving infrastructure and transportation in its development strategy for sustainable growth at the time of appraisal and ex-post evaluation. The project is also considered relevant to its transportation sector policy and the Presidential Decree in which the government has consistently prioritized strengthening the transportation capacity and prompting railway development.

3.1.2 Relevance to the Development Needs of Uzbekistan

Uzbekistan, which is a doubly landlocked country, has made establishing the quickest route to oceans its top priority and targeted the development of a transportation route to the port of Karachi,

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

[3] ③: High, ② Fair, ① Low

Pakistan, from Termez via Afghanistan. At the time of appraisal, however, there was no direct route connecting Surkhandarya province, to which Termez belongs, and the neighboring Kashkadarya province, without traversing Turkmenistan. Moreover, it took more than 15 hours for customs clearance procedures at the border crossing and to traverse Turkmenistan, and the daily delay often hindered efforts to increase the reliability of transportation.

In recent years, the tonnage carried by freight trains has increased by 57% compared to before the project (2003), representing an increase in freight transport, thanks to economic growth in Uzbekistan and assistance to Afghanistan (Table 1). The volume of passenger transportation in 2012 was increased by only around 10% compared with before the project. A breakdown of the increase reveals a climbing trend in long-distance trains, and, in 2012, the volume of passenger transportation by long-distance trains have more than quintupled compared to that of 2003 (Refer to Table 2 and Local trains (Long distance) in Figure 2). This reflects a growing need in particular for long-distance trains.

The project line is a trunk line connecting the southern region of Uzbekistan and other regions, and has become an important transport route via Termez. There is therefore a considerable need for the project even at the time of ex-post evaluation.

Table 1 Railway Freight Volume

(Unit: Thousand Tons)

Year	2003	2011	2012
Volume	52,349	80,910	82,387

Table 2 Railway Passenger Volume

(Unit: Thousand Persons)

Year	2003	2011	2012
Number	16,061	16,401	17,828

Source: JICA (2013) "Data Collection Survey on Railway Electrification in the Republic of Uzbekistan".

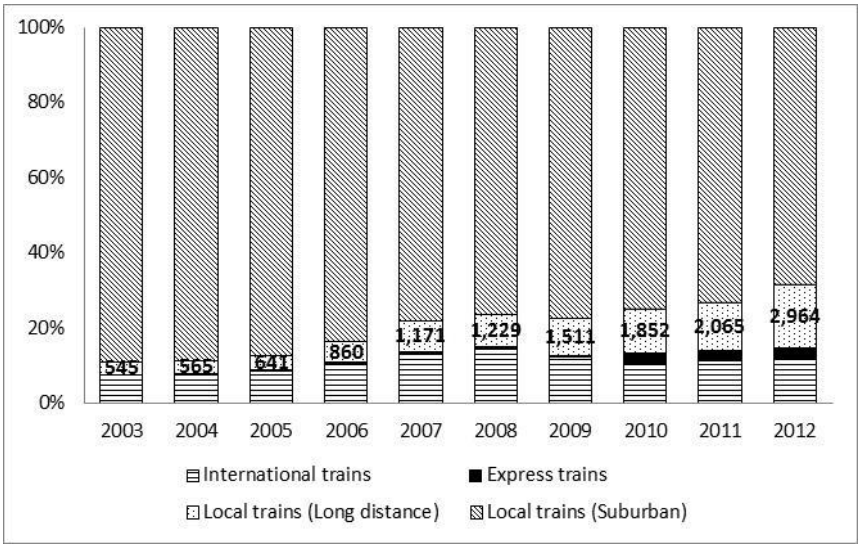

Figure 2 Railway Passenger Volumes by Train

Note: Numbers in the bar chart shows passenger totals for Local trains (Long distance).
Unit is thousand persons.
Source: JICA (2013) "Data Collection Survey on Railway Electrification in the Republic of Uzbekistan".

3.1.3 Relevance to Japan's ODA Policy

At the time of the appraisal, the policy of assistance to Uzbekistan[4] identified three priority areas, namely "1. Assistance for human resource and institutional development for economic and industrial development," "2. Regional development (Agriculture, education and healthcare)," and "3. Upgrade and maintenance of economic infrastructure (transportation and energy)". Among them, "3. Upgrade and maintenance of economic infrastructure (transportation and energy)" includes infrastructure development including the railway. Accordingly, the project is relevant to the Japan's ODA policy.

As described above, this project has been highly relevant to the Uzbekistan's development plan, development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness[5] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Volume of Passenger and Freight Transportation at Project Line

As shown in Table 3, volumes of both passengers and freight have increased compared to the baseline. Although the volume of passengers was less than planned, the project achieved 88%[6] of the plan, and the expected effect was largely obtained. The increase in the volume of passengers and freight is attributed to the shift of transportation means from cars and buses to railway, partly because the project constructed new stations or lines which improved access to major cities in the southern region and neighboring countries where freight/passengers are transported, and reduced travel time and cost[7]. In addition, increasing freight in accordance with the reconstruction work in Afghanistan[8] was also considered as a contributing factor of such increase.

Table 3 Volume of passengers and freight transportation on target lines

	Baseline Year (2003) Baseline	Target Year (2012) Target	Completion Year (2012) Actual	Achievement level
Volume of passenger transported (Thousand passengers/year)	534	764	672	88%
Volume of freight transported (Thousand tons/year)	5,129	5,430	5,956	110%

Source: Data provided by the executing agency

[4] ODA Task Force Policy Consultation, July 2004.
[5] Sub-rating for Effectiveness is to be put with consideration of Impact.
[6] The actual volume of passenger transportation was 88% of the target partly because the hand luggage allowance became restricted to a maximum of 36 kgs. According to UTY, almost all passengers normally take huge amounts of luggage in Uzbekistan. Thus, a part of the passengers shifted the means of transportation from railway to cars due to the restricting the luggage allowance, which affect the actual volume of passenger transportation
[7] Based on interviews with UTY staff.
[8] Refer to 3.3.1.3. Establishment of regional transportation corridor as for the details of the freight transportation volume to Afghanistan.

3.2.1.2 Volume of Passenger and Freight Transportation at All Lines

The volume of passengers and freight transportation on all UTY lines at the time of ex-post evaluation achieved 150% and 112% of each planned target, respectively (see Table 4 below). According to the executing agency, the volume of passengers transported has been increasing on lines connecting tourist cities, such as Tashkent-Bukhara [9], Tashkent-Samarkand [10], and Tashkent-Urgench[11], which are not targeted in this project. However, the increase in tourists, thanks to railway service improvements such as launching the express service between Tashkent and Samarkand in 2011 as well as opening a new line under this project, is cited as one of the reasons for increasing the volume of passenger transported. Also the increased volume of freight transported on targeted lines, which accounts only for 7%[12] of the UTY total lines, are attributed to the increase in traffic volume associated with national economic growth, revitalization of the mining industry and the opening of large-scale new business (companies). Given that the targeted lines (223km) represent only 5% of all UTY lines (4,636km), the project is considered to contribute to a certain increase in the volume of freight transported.

Table 4 Volume of passenger and freight transportation on all UTY lines

	Original Year (2003) Baseline	Target Year (2012) Target	Completion Year (2012) Actual	Achievement level
Volume of passenger transported (million passenger km[note]/year)	2,077	2,285	3,438	150%
Volume of freight transported (million ton km[note]/year)	18,867	20,250	22,686	112%

Note: Million passenger km and million ton km are units showing the transportation amount. Passenger km shows an amount calculated by multiplying the number of passengers by the length (km) of the transportation, and ton km shows the tonnage of freight multiplied by the length (km) of the transportation.
Source: Data provided by the executing agency

3.2.1.3 Travel Time of Passengers and Freight Trains at Targeted Lines

The travel time of passenger trains on targeted lines at the time of ex-post evaluation (see Table 5 below) was 5.7 hours, which slightly exceeded the targeted time of 5.5 hours but drastically improved compared to 11 hours at the time of baseline survey. The travel time for freight trains was 7.2 hours, which was dramatically reduced from the baseline of 17.5 hours, and also achieved the planned target. The main reasons for such reductions in both travel times were the fact that the

[9] Bukhara was a prosperous cultural center not only in Central Asia but throughout the Islamic world until the beginning of the 20th century and many Islamic monuments remain. The old town of Bukhara was listed by UNESCO as a World Heritage Site in 2000.
[10] Samarkand is an ancient capital of Uzbekistan, referred to as the "blue city" due to its many blue mosques. In 2001, UNESCO added the city to its list of World Heritage Sites.
[11] There are many ruins of mosques and madrasas in Urgench. The city is also the main gateway to Khiva, which was listed by UNESCO as a World Heritage Site in 1991.
[12] Based on 2012 data, 7% was calculated by dividing the volume of freight transportation on targeted lines (5,956 thousand tons) by the volume for all lines (82,387 thousand tons).

travel distance was reduced by constructing new lines and eliminating the need for customs clearance[13] by bypassing Turkmenistan.

Table 5 Travel time of passenger and freight trains on target lines

	Original Year (2003) Baseline	Target Year (2012) Target	1 Year after Completion (2013) Actual
Travel time of passenger trains (hour)	11.0	5.5	5.7
Travel time of freight trains[14] (hour)	17.5	7.3	7.2

Source: Data provided by the executing agency

3.2.1.4 Number of Passenger and Freight Trains at Targeted Lines

As shown in Table 6, the number of passenger trains running between Tashguzar and Kumkurgan, the target line of this project, was 1,460 on a full-year basis at the time of ex-post evaluation, achieving 91% of the planned target. Under circumstances where the volume of passenger transported achieved 88% of the target (see 3.2.1.1 Volume of passenger and freight transportation on the project lines), the actual number of passenger trains was also slightly lower than the planned target, but almost achieved it. Meanwhile the number of freight train reached 94% of the planned target, which shows a decreased number of freight trains compared to the baseline year of 2003 though a certain number of freight trains were secured. In fact, the number of freight trains did not achieve the planned target, although the volume of freight transported exceeded the target (see 3.2.1.1 Volume of passenger and freight transportation on the project line). This was due to an adjustment in the number of trains and freight amount per cargo considering the operation cost. According to UTY, there was no change in operational plan or policy, and, although an increased number of trains is a desirable effectiveness indicator, the number of operating trains impacts on the financial aspects, namely the cost and benefit per operating train. Therefore, such increases are not always considered positive, with the cost/benefit performance of train operation in mind.

Table 6 Number of passenger and freight trains on target lines (year)

	Original Year (2003) Baseline	Target Year (2012) Target	Completion Year (2012) Actual	Achievement level
Number of passenger trains (year)	1,272	1,604	1,460	91%
Number of freight trains (year)	5,110	5,174	4,865	94%

Source: Data provided by the executing agency

[13] Before the project, customs clearance used to take about two to three hours when traversing Turkmenistan.
[14] Standing, accelerating, decelerating and replacing time is not included.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Improved Railway Transportation Service

At the time of appraisal, Turkmenistan had to be traversed when traveling or transporting items to a neighboring country or even within Uzbekistan or when traveling from southern provinces to other provinces. However, at the time of ex-post evaluation, travel time and distance had been reduced by taking lines newly constructed under this project. Consequently, the reliability of railway transportation was improved. For example, as shown in Table 7 below, the travel distance was shortened to nearest stations in neighboring countries from Karshi, an important hub of the railway network in Uzbekistan.

Table 7 Shortening of travel distance by new line

Section	Before Project	After Project
Karshi – Sariasia[Note 1] (km)	480 km	326 km
Karshi – Kumkurgan [Note 2] (km)	290 km	156 km

Note 1: The station near the border with Tajikistan
Note 2: The line connected to Termez (the city near the border with Afghanistan) via Kumkurgan
Source: Data provided by the executing agency

Reducing both the transportation distance and time helped improve the railway transportation service for customers. The result of the beneficiary survey[15] in ex-post evaluation also shows that 93% of respondents answered that they were "very satisfied" with railway transportation services upon completion of the project. Much improved accessibility to each destination is cited as the main reason (96%). In addition, more than 90% of respondents selected "very good" or "good" for the frequency of railway transportation services, reliable operation (frequency of delay), transit time and safety. More than 90% of respondents declared themselves satisfied with the current railway transportation services (See Table 8).

Table 8: Railway transportation services (based on the result of the beneficiary survey)

	Very Good	Good	Usual	Not Good	Bad
Frequency	85 %	11 %	4 %	0 %	0 %
Accuracy	76 %	22 %	2 %	0 %	0 %
Transit / Commute time	67 %	30 %	3 %	0 %	0 %
Safety	91 %	9 %	0 %	0 %	0 %
Satisfaction level	86%	7%	6%	0 %	0 %

3.3.1.2 Promoting the Development of Southern Region

This project was expected to have a certain impact on the economic development of the

[15] The summary of the beneficiary survey is as follows. Survey location: each station of the target lines (Kumkurgan, Tashguzar, Baisun, Darband, Termez and Dekhanabad). Survey respondents included passengers, residents living near railway stations and merchants. 132 people in total (male 98, female 34)

southern region by promoting the development of mineral resources. Industrial data by region was not available, but based on the gross regional product growth rates of the national average and target 2 provinces (Kashkadarya, Surkhandarya) obtained from publicized data, no increase in gross regional product was confirmed in the target area before and after implementing this project (See Figure 3).

Interviews with staff of the executing agency and railway station revealed that constructing the new line had created new employment at new stations and railway-related facilities and helped boost housing near new stations. During the construction of the new line and stations, factories producing minerals and chemicals decided to relocate nearer the station to ensure convenient transportation of their products and also reduce transportation costs. These factories started their operations to coincide with the opening of new stations and also contributed to the increase in the employment of local residents. Moreover, education, health and sport facilities were also constructed around the station for residents newly employed at new stations, railway-related facilities, shops and factories. These changes are considered to help revitalize neighboring societies and economies (The details are referred to in the【Box】).

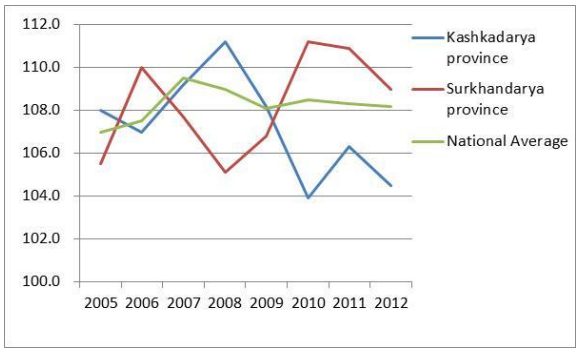

Figure 3: Gross regional product growth rate (year on year)

Source: Center for Economic Research, "Uzbekistan Economic Trends: Information and Analytical Bulletin for January – June 2013)

【BOX】Socioeconomic effects of implementing the "Tashguzar – Kumkurgan New Railway Construction Project"

Implementing the project had various socioeconomic effects on areas neighboring the newly constructed lines. Economic effects emerged in the form of about 5,100 new jobs over 3 years with the construction of the new line. Of that total, 2,000 people, including many local residents, worked as staff in regional offices of the executing agency, as staff at new stations, or as maintenance staff or assistant service staff of each station. Another 2,000 people were employed by factories or the related companies having relocated nearer the new stations, aiming to reduce the cost of transporting products during or after the construction of the new line. Following construction of residences for UTY or factory employees, commercial and sport facilities, physician's offices and schools, or other socially important infrastructure were constructed around the stations, which had been vacant land before the project implementation. Such development helped revitalize the regional economy and society.

For instance, with the increased number of residents around the newly constructed Darband station, a junior high school where 216 students studied at the time of ex-post evaluation was constructed with financial assistance from UTY, based on the discussion with the local authority. This new school is located in the center of neighboring four villages and allowed easy access from all villages compared to the old school, which involved some students who had to walk for one hour to commute. In another example, new sport facilities were also constructed next to Dehkanabat station. One of the major facilities, an indoor area, has 50 seats and provides recreational opportunities for residents, such as holding mid-size sporting events.

In the interviews, it was mentioned that building such facilities or holding these events would be impossible in this area if this project had not been implemented.

According to the executing agency, once ongoing electrification on the target line (new Japanese ODA loan "Karshi-Termez Railway Electrification Project") is completed, it is expected to increase the train speed, the number of operating trains and transportation volume, thereby further revitalizing the economy around the lines in future. Consequently, it is expected to expand the employment opportunities two times as many as mentioned above.

As described above, the new line have facilitated transportation of freight, and the residents around the target lines of this project considerably gained not only economic effects such as the construction of commercial facilities or the jobs created in railways and related facilities but also social effects such as improved access to educational, sport and health facilities.

Constructed School
near Darband Station

Constructed Sports Facility
near Dehkonobod Station

3.3.1.3Establishment of a Regional Transportation Corridor

The implementation of this project helped develop the national railway network. For instance, access has now been opened up to southern Surkhandarya province, which lacked any means of transportation to neighboring provinces in Uzbekistan unless detouring via Turkmenistan before the new line to Kashkadarya province was constructed.

At the same time, the new line enabled direct freight access to Afghanistan without traversing Turkmenistan, which led to an increase in freight transportation volume to Afghanistan from the country in 2012 as of the project completion, as shown in Table 9. This increase is considered attributable not only to the considerable needs for freight transported amid the reconstruction of Afghanistan but also reduced transportation time and cost by preventing the traverse of Turkmenistan.

Table 9: Volume of freight transported from Uzbekistan to Afghanistan

	No. of wagons		Volume of freight (tons)	
	2011	2012	2011	2012
Export	11,745	16,385	673,646	977,784
Transit	41,506	45,703	2,619,095	2,929,020
Total	53,251	62,088	3,292,741	3,906,804

Source: Data provided by the executing agency

At the time of ex-post evaluation, the "Karshi-Termez Railway Electrification Project" was ongoing under a new Japanese ODA loan, and the new line connecting Termez, a city near the border through to Mazar-e-Sharif in Afghanistan was also constructed with ADB aid. Along with the implementation of both projects, the regional transportation corridor would be utilized more efficiently in the future. This project provided a foothold for formulating the regional transportation corridor.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the time of appraisal, "JBIC Guidelines for Confirmation of Environmental and Social Considerations" (April 2002) were applied and an environment management plan had to be formulated. The items on the right are specified environmental considerations, all of which were complied with in the project. Moreover, the predictive values for air, water, noise and vibration after the completion met the national criteria and there was no impact on the natural environment.

【Environmental considerations】
- During the period of construction works in late summer, animal breeding period should be considered.
- During the period of operation in riverbeds and floodplains of streams from summer to fall, it should be considered to ease negative impacts on hibernating mammals, reptiles, amphibians and spawning.
- Blasting in mountain areas from July to December should be conducted when the animals are not active.

Source: Documents provided by the executing agency

3.3.2.2 Land Acquisition and Resettlement

At the time of appraisal, resettlement of 62 households was expected. However, 136 households eventually resettled at the time of construction due to the change of access road. With the implementation of this project, the country's land use law and resettlement plan were explained to the targeted residents, whose understanding were obtained on condition that the project was implemented with the continuous collaboration of residents through information delivery and consultation meetings. Also based on the designated article[16], 1.1 billion sum was paid[17] to resettlement residents along with the construction of the new line. A series of processes was conducted in compliance with the designated articles of the country, and no issues emerged.

3.3.2.3 Unintended Positive/Negative Impact

(1) The increase in UTY income and foreign currency savings

The construction of the new line brought extra income for UTY, the executing agency, from the freight transportation charge between Kumkurgan and Termez, which was previously collected by

[16] Decree of the Cabinet of Ministries No. 97 (May 2006)

[17] The figure of 1.1 billion sum was equivalent to about 121 million yen based on the exchange rate as of the project appraisal (1 sum = 0.11 yen as of January 2004), which meant approximately 8.09 million sum (about 0.89 million yen) per house was paid. This was equivalent to the amount required to buy a 2LDK apartment in the capital city, Tashkent, at the time, and thus resettlement residents were paid sufficiently.

the national railway of Turkmenistan. The increased income totaled 56 million dollars for 2011 and 2012.

The construction of the new line also boosted foreign currency savings on customs duties and railway fares paid to the Turkmenistan government. According to estimates by the executing agency, these savings amounted to about 38 million dollars in 2011 and 46 million dollars in 2012, for a total of 84 million dollars.

By implementing this project, the volume of passenger and freight transportation on target lines has been increased, and the impacts were confirmed such as the improved national rail network, reduced transportation distance to neighboring countries, and improved railway services. This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Output

This project comprises 1) construction work of the new line, including rehabilitation of existing line, 2) construction of steel bridges, 3) installation of signaling and telecommunication works, 4) procurement of machinery for construction and maintenance and 5) consulting services. The comparison of the final output with the original plan is as follows in Table 10.

Table 10: Output plan and actual of this project

Item	Plan	Actual
1) Construction of a single-track railway line Tashguzar - Dekhanabad Dekhanabad - Baisun Baisun - Kumkurgan	 56.6 km 108.7 km 56.3 km	 57.2 km 110.6 km 55.6 km
2) Rehabilitation of existing track Karshi – Tashguzar	31.0 km	As planned
3) Construction of steel bridge（B zone）	5 bridges	As planned (Design partially modified)
4) Signaling and telecommunication works Signaling Telecommunication works	 ・Installed in 17 new stations and operating control center (“OCC”) ・Telecommunication equipment installed in 17 new stations and OCC, fiber-optic and transmission system cables and trunk communication equipment installed in Marakand - Karsh－Tashuguzar－Kumkurgan	 As planned (Design partially modified)
5) Procurement of machinery for construction and maintenance Track materials Maintenance machinery	 ・R65 hardened rail, fastening devices, wooden sleeper, turnout ・Lining and tampering machine,	 As planned

	mechanized flat wagon	
6) Consulting services	a. Detailed design / bidding support / construction management b. Monitoring of progress status / proposing improvement strategy c. Financial statement of the executing agency during the project / audit report / review of business plan	As planned

Of Table 10, 1) construction work was almost performed as planned, and 2) rehabilitation of existing line, 5) procurement of machinery for construction and procurement and 6) consulting service were as planned. There was a difference in 1) length of the new line from the original length taken from the feasibility survey to the actual length determined after a geological survey. A portion of 3) construction of steel bridge and 4) installation of signaling and telecommunication works was changed, primarily for the following reasons:

- Design alteration for foundations of five steel bridges: Additional foundation works were required for all bridges. This alternation was unpreventable to secure safety (strength). Therefore, these changes are considered appropriate. (details of additional works were referred to in "3.4.2.2 project period").

- Design alteration for telecommunication works and aggregated electricity: Telecommunication works were also subject to changes in layout and design to respond to the increased demand and the requirement for safety. These changes are considered appropriate since they took place in response to the actual situation and did not affect the project effects.

Newly constructed station (Darband Station)

Installed communication equipment

Special Terms for Economic Partnership ("STEP") [18] were applied to this project. A

[18] STEP was introduced with a view to raising the visibility of Japanese ODA among citizens through technical transfer to recipient countries with best use of advanced technologies and know-how of Japan. Eligible countries are those eligible for Japanese ODA Loans and tied aid under the OECD rules. Projects eligible for STEP are those aiming for target sectors and fields of the scheme, and at the same time, those for which Japanese technologies and/or equipment are fully made use of.

questionnaire survey with UTY confirmed the high level of satisfaction with this STEP scheme because it enabled them not only to apply the Japanese ODA Loan conditions including a low interest rate and long-term repayment period but also to utilize advanced Japanese techniques as well as materials and equipment with high quality.

3.4.2 Input

3.4.2.1 Project Cost

The actual cost was 56,395 million yen (16,359 million yen from a Japanese ODA loan) while the original plan was 48,317 million yen (16,359 million yen from a Japanese ODA loan). Thus, the total project cost was slightly higher than planned (117%). This increased cost was due to additional works required to secure the strength of the steel bridge foundation under consideration of the current situation (details are referred to in 3.4.2.2 Project Period), and also due to inflation[19] and exchange losses[20] during the project. The project cost by Uzbekistan was increased to cover these changes. The project estimated a certain level of inflation and exchange losses but the changes during the project implementation exceeded the estimated values. In an interview survey with the executing agency, it was explained they perceived covering this loss by the Uzbekistan side as a huge burden.

3.4.2.2 Project Period

The project was scheduled to last for a total of 78 months, from October 2004 to March 2011. However, the project actually took 87 months, from October 2004 to December 2011, which was longer than planned (112%).

The main reason for the extension was the additional work required on the steel bridge foundation. Although the excavation depth was estimated at about 1 – 3m at the time of appraisal, troubles emerged when work started on fixing the foundation due to unsecure conditions caused by the waterbed with watery ground and large stones and rocks. Consequently, the excavation depth had to be up to 10m for each bridge, which required additional time and resulted in the project period being extended. However, this additional work was necessary for safety. Security was the prime concern when constructing the steel bridge. Under such circumstances, the project extension was considered reasonable.

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

Economic Internal Rate of Return (EIRR) and Financial Internal Rate of Return (FIRR) were

---

The prime contractor shall be a Japanese company with tied, and subsidiary should be in the form of general untied. Conditions include that a minimum of 30% of the total contract amount, which is the subject of Japanese ODA Loan, should be financed to (i) goods and materials from Japan as well as services provided by Japanese companies or (ii) goods and materials from Japan only.

[19] According to UTY staff, increased reconstruction assistance to Afghanistan resulted in inflation for goods related to construction, even in Uzbekistan.

[20] The exchange rate at the time of this project appraisal was 1 sum=0.11 yen (1US$=108 yen). However, the rate at the time of project completion was 1 sum=0.04 yen (1US$=79 yen)

recalculated based on specific condition at the time of review[21]. EIRR was 11.8 %, as opposed to 5.5% at the time of appraisal and FIRR was 8.5 %, as opposed to 0.5% at the time of appraisal, meaning the results of both returns improved. The major reason for this improvement was because the actual value for GDP growth rates, which were used to calculated for the demand forecast for the volume of passenger and freight transported, exceeded the level of predicted forecast at the time of appraisal.

As mentioned above, both project cost and project period exceeded the plan. Therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspect of Operation and Maintenance

The operation and maintenance (O&M) of all lines, including target lines of this project, were supervised by the executing agency, UTY[22]. At the time of ex-post evaluation, UTY has 68,000 employees, working in individual functional departments of "Subdivisions servicing traffic process," "Enterprises implementing freight transportation and forwarding," "Repair and services enterprises," "Production, repair and construction infrastructure" and "Social infrastructure", as well as 6 regional railway branches which maintain each railway network and develop a maintenance plan. Of the target lines, the stretch from Tashguzar to Akrabat comes under the Karshi regional railway branch and from Akrabat to Kumkurgan is under the Termez regional railway branch.

A total of 671 O&M staff are assigned on the target line under the Karshi regional railway branch and 822 on the target line under the Termez regional railway branch. According to UTY and the staff at each station during site visits, both branches had secured sufficient staff to ensure adequate O&M. Other stations and regional railway branches also had sufficient staff and there were adequate relationships among each station, regional railway offices and UTY. Accordingly, no major problems were observed in terms of institutional aspects of O&M.

[21] EIRR - Cost: construction cost, O&M cost, Benefit: transportation cost reduction effect (passenger and freight trains), new demand, time-shortening effect (passenger trains), increased income from Tajikistan and converted demand from road, Project life: 40 years after completion
FIRR – Cost: construction cost, O&M cost, Benefit: increased income of cargo rate, Project life: 40 years after completion

[22] UTY is a government-owned company and there are no plans to privatize or sell stocks in the future (Draft Country Resolution, March 3, 2001. No. 108)

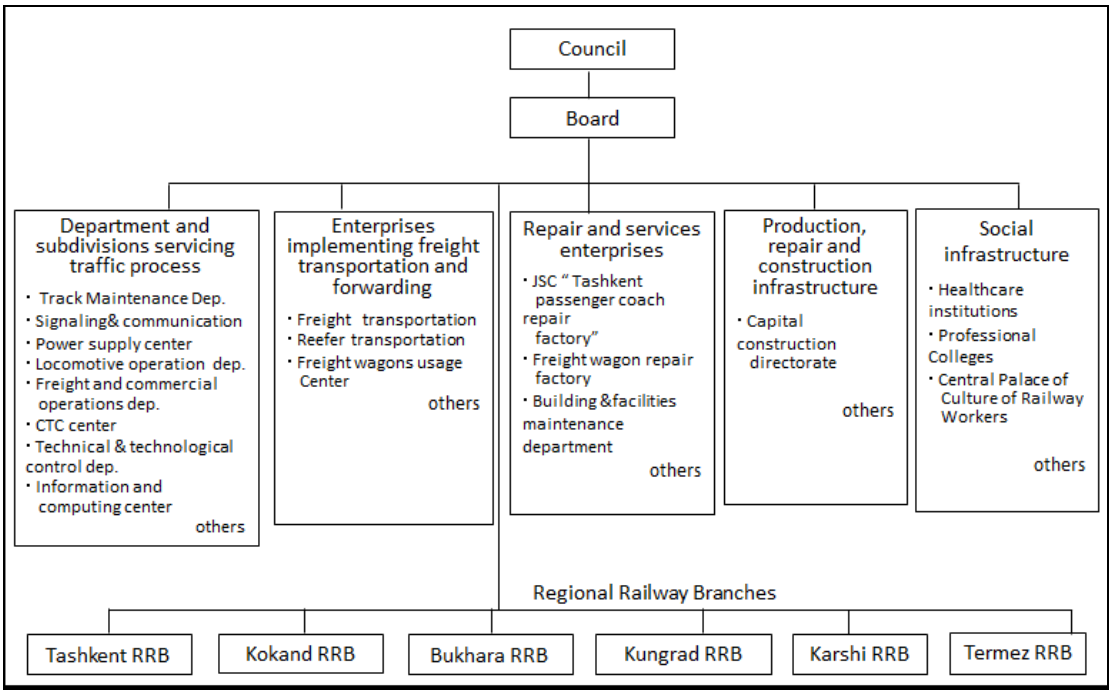

Figure 4 Organization Chart of UTY

Source: Document provided by the executing agency

3.5.2 Technical Aspect of Operation and Maintenance

UTY has a training center and holds technical training and maintenance retraining, which are scheduled by UTY annually, though the training frequency is not defined. The regional railway branch also holds maintenance and safety management training. Many staff learned basic railway knowledge of railway at Railway college or received a bachelor's degree in management or engineering at a Railway University. Accordingly, most staff have basic knowledge of infrastructure such as railway tracks, which is necessary for maintenance and management. Even outside the county, about 50 staffs have the opportunity to attend seminars[23] held in Russia every year. Under these circumstances, it is considered that UTY provides proper training opportunities for staff.

Accordingly, no major problems were observed in the technical aspects of O&M, as the executing agency holds regular training sessions and strives to maintain the technical capacities of staff.

3.5.3 Financial Aspect of Operation and Maintenance

At the time of ex-post evaluation, the O&M cost on the target line had increased every year (See Table 11), and the executing agency indicated there was no shortage in the O&M budget so far.

Based on financial data, the annual equity ratio, the net asset on the balance sheet, was 64% (2010), 67% (2011) and 70% (2012); showing relatively high ratios and an increasing tendency and

[23] Seminars including "traffic control management" "signaling and communication" "track facilities management" "railway transport management of high speed tracks" "maintenance and repair of tracks with the use of track machines" and "maintenance of signaling systems and communications in areas of high-speed track" were held.

indicates mid to long-term stability. Annual operational income is also increasing steadily, 385,061 million sum in 2010, 630,425 million sum in 2011 and 801,264 million sum in 2012. Those annual net incomes for these three years are 356,323 million sum, 582,206 million sum and 763,205 million sum respectively (See Table 12). Accordingly, the business continuity of the financial aspect is high.

Table 11: O&M cost of target lines under this project

(Unit: million sum)

2010	2011	2012
28,338.9	34,773.7	49,710.0

Source: Documents provided by the executing agency

Table 12: Financial data of UTY: Balance Sheet (left) and P/L Statement (right)

(unit: million sum)

	2010	2011	2012
Asset			
Current asset	785,148	1,059,027	1,360,830
Long-term asset	2,523,608	3,256,687	4,113,797
Total	3,308,757	4,315,715	5,474,627
Liability	1,189,473	1,444,906	1,621,083
Long-term liability	830,540	1,041,154	1,065,530
Others	358,933	403,752	555,552
Net asset	2,119,283	2,870,808	3,853,544
Total liabilities and net assets	3,308,757	4,315,715	5,474,627

(Unit: million sum)

	2010	2011	2012
Gross sales	1,631,493	1,998,463	2,704,403
Production cost	1,063,165	1,115,549	1,590,727
Gross income	**568,327**	**882,913**	**1,113,675**
Expenses for time period	252,247	330,615	409,576
Other operational expenses	68,981	78,127	97,164
Income from main activities	**385,061**	**630,425**	**801,264**
Non operating income	22,957	36,521	46,199
Non operating expense	37,873	62,713	56,764
Income before tax	**370,145**	**604,233**	**790,699**
Income tax and others	13,821	22,026	27,493
Total liabilities and net assets	**356,323**	**582,206**	**763,205**

Source: Document provided by the executing agency

Therefore, no major problems have been observed in the financial aspects of O&M.

3.5.4 Current Status of Operation and Maintenance

Tracks, steel bridges, signaling and telecommunication equipment and machinery are all operated well and in good condition. Train operation diagrams, staff allocations and detailed O&M plans for the new line constructed under this project were not determined at the time of appraisal but had to be determined when starting operation in 2011. All the items had actually been developed in 2007.

For the periodical maintenance of main facilities at the time of ex-post evaluation, tracks are checked for each zone by using specific equipment[24] on a daily basis and steel bridges are monitored by track maintenance staff of Dehkanabat, Chashmaihafizon, Akrabat and Darband station on a weekly basis. Signaling and telecommunication equipment is also checked periodically based on a prepared check sheet, though the frequency of the check varies depending on the equipment. A manual for maintenance items and maintenance activities is distributed to and used by each station. UTY also prepared a poster with graphs and pictures and promoted its active use, such as putting it on a wall.

[24] Equipment for track maintenance was provided as part of a technical assistance project for a Japanese ODA Loan.

Maintenance equipment for track

A maintenance poster attached to the wall (produced by the executing agency)

The target line of this project was a mountain railway traversing many steep pitches and curves, and the first railway line constructed in such area in Uzbekistan. In addition, a Japanese ODA loan project, the "Karshi-Termez Railway Electrification Project", started in 2012 to ensure the transportation capacity in response to increased demand, and it was expected to improve the technical ability of the executing agency, including the track maintenance and operational plan, in accordance with the construction and electrification of the new line. Under these circumstances, "Capacity Development on Upgrading Track Maintenance and Train Operations Skills related to Tashguzar-Kumkurgan New Railway Line" was implemented as a technical cooperation for a Japanese ODA loan from 2012 to 2013. During this project, training in 4 areas[25] was implemented to enhance the technical skills of the UTY staff. In an interview survey with the project trainees from UTY, it was explained that the timing of implementing training, after project completion and before the electrification project, was effective.

UTY, the executing agency that is responsible for maintaining the facilities and equipment of this project, has a proper organization to operate railway services and maintain facilities and equipment. The staff have opportunities to attend a series of maintenance training sessions. From this aspect, there are no major problems with the technical aspects of maintaining facilities and equipment. UTY also earns an adequate income and has no budget concerns for sustainability. Accordingly, no major problems were observed in the institutional, technical and financial aspects of O&M system. Therefore sustainability of the project effect is high.

4. Conclusion, Lessons learned and Recommendations

4.1 Conclusion

This project was implemented for establishing a more reliable and efficient railway transport network by constructing a new line between Tashguzar-Kumkurgan and rehabilitating the existing line

[25] 4 areas: "train operation planning", "track rectification planning", "track maintenance planning" and "electric locomotive maintenance planning".

between Karshi-Tashguzar and thereby helping promote the socioeconomic development of the southern region. Uzbekistan has worked to strengthen transportation capacity and promotes railway development for sustainable growth, meaning this project has been highly relevant to Uzbekistan's development plan and needs. Implementing this project increased the volume of freight and passenger transport not only for target line but also the whole line in Uzbekistan, and also reduced transportation time and distance and improved railway services by enabling internal travel bypassing neighboring countries. The socioeconomic impact around the target lines was also observed. Although the efficiency of this project is fair as both the project period and cost exceeded the plan, the sustainability of the project effect is expected to be assured since the project lines are in good operational and maintenance condition and there are no concerns over institutional, technical and financial aspects on the part of the executing agency.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

This project contributed to the establishment of a national railway network and improved access to neighboring countries. The electrification project for target lines under this project is implemented by JICA at the time of ex-post evaluation, which plans to connect the project line to a new line newly constructed by the executing agency between Termez and Mazar-e-Sharif in Afghanistan. Accordingly, it is expected to enhance the effect and impact of the project lines. In light of the above, it is important to ensure the implementation of an ongoing project and develop an appropriate operation plan that will meet the increasing demands.

4.3 Lessons Learned

- Calculating the estimated cost based on risks of exchange rate changes and inflation and the involvement of the executing agency in this process

  Under this project, the Uzbekistan government absorbed all project cost excesses which resulted from additional work on the construction of steel bridges, inflation and exchange losses. Though a certain level of inflation was estimated as of the project appraisal, exchange losses and inflation, which exceeded estimate, were incurred. According to UTY, this payment was considered a huge burden in the interview. In case of countries where prices and exchange rate largely fluctuate like Uzbekistan, a project should take careful note of contingency based on a review and discussion of the risks of exchange rate fluctuation and inflation with the partner country and executing agency.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1.Project Outputs		
1) Construction of a single-track railway line		
Tashguzar - Dekhanabad	56.6 km	57.2 km
Dekhanabad - Baisun	108.7 km	110.6 km
Baisun - Kumkurgan	56.3 km	55.6 km
2) Rehabilitation of existing track		
Karshi – Tashguzar	31.0 km	As planned
3) Construction of steel bridge（B zone）	5 bridges	As planned (Design partially modified)
4) Signaling and telecommunication works		
Signaling	・Installed in 17 new stations and OCC	As planned (Design partially modified)
Telecommunication works	・Telecommunication equipment installed in 17 new stations and OCC, fiber-optic and transmission system cables and trunk communication equipment installed in Marakand-Karsh－Tashuguzar－Kumkurgan	As planned
5)Procurement of machinery for construction and maintenance		
Track materials	・R65 hardened rail, fastening devices, wooden sleeper, turnout	As planned
Maintenance machinery	・Lining and tampering machine, mechanized flat wagon	
6) Consulting services	a. Detailed design/bidding support/construction management b. Monitoring of progress status/proposing improvement strategy c. Financial statement of the executing agency during the project/audit report / review of business plan	As planned
2.Project Period	October 2004 – March 2011 (78 months)	October 2004 –November 2011 (87 months)
3.Project Cost		
Amount paid in Foreign currency	15,587 million yen	15,564million yen
Amount paid in Local currency	32,730 million yen (297, 545 million sum)	40,831million yen (1,020,775 million sum)
Total	48,317 million yen	56,395 million yen
Japanese ODA loan portion	16,359 million yen	16,359 million yen
Exchange rate	1 sum = 0.11 yen (As of January, 2004)	1 sum = 0.04 yen (Average between October, 2004 and December, 2011)