

Kingdom of Morocco

FY 2016 Ex-Post Evaluation of Japanese ODA Loan Project
“Rural Road Improvement Project”

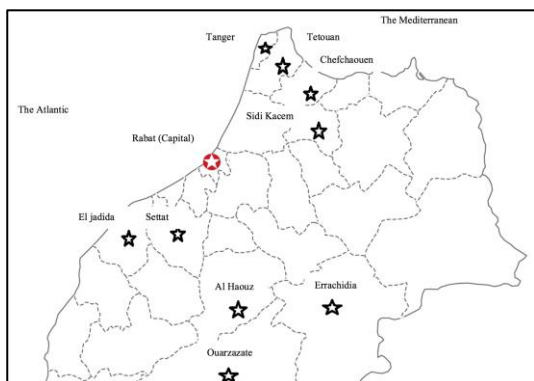
External Evaluator: Takeshi Daimon, Waseda University

0. Summary

This project aimed to develop a portion of 15,500 km of rural roads, based on “The Second National Program of Rural Roads (Deuxième Programme National des Routes Rurales: PNRR2)” (2005–2015) laid down by the Moroccan Government. It aimed to improve traffic access for the inhabitants of roadside communities, improve the living conditions, and redress regional disparities by developing and improving rural roads. This project has been highly relevant to Morocco’s development policy and needs as well as Japan’s ODA policy. Therefore, its relevance is high. Although the project cost was consistent with increased outputs (within the plan), the project period exceeded the plan. Therefore, the efficiency of the project is fair. Among the effectiveness indicators, the annual average daily traffic mostly reached the target value, and the road cut-off dates and access rates also mostly achieved the target set for the evaluation. Moreover, the poverty rate in rural areas and school enrollment rate (particularly the enrollment rate for girls) improved subsequent to this project. The frequency of visits to health facilities marginally improved, and the operating distance and sales of transportation companies improved. However, traffic accidents increased after the project. Taking into account all these findings by the executing agency of PNRR2, the effectiveness and impact of the project are high. While institutional, technical, and financial aspects of the operations and maintenance (OM) are high in regional and provincial roads, non-classified roads administered by communes continue to have issues to address. Taken all together, that sustainability of the project in regional and provincial roads are high and some problems have been observed in non-classified roads, the sustainability of the project effects is fair.

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

1. Project Description



Project location
(prefectures targeted by the project)



Non-classified roads (El Jadida)

1.1 Background

Economic activities through Morocco's transport sector play a major role in the economic and social activities of the country, accounting for approximately 6% of the gross domestic product (GDP) at the time of appraisal, while giving rise to 10% of employment in urban areas and 15% of the national budget. With regard to land transportation in particular, 90% of the intercity passenger transport and 75% of freight is conveyed by road. The market of land transport was restricted until 2003, when the Transportation Act came into effect, and thereafter the road transport sector was liberalized. This liberalization of road transport was expected to accelerate land transport between urban and rural areas, and broaden the transport sector.

At the time of appraisal, there were 57,622 km¹ of public roads in Morocco, and 80% of the highways, national roads, and regional roads were paved. On the other hand, provincial roads as well as rural roads (total length of 23,200 km at the time of appraisal) which are positioned under the highways, national roads, and regional roads above mostly consisted of unclassified roads (Routes Non-Classifiées: hereinafter referred to as "NC" roads), which are not under the management of the Directorate of Roads² (hereinafter referred to as "DR") in the Ministry of Equipment, Transportation, Logistics and Water (Ministère de l'Équipement, du Transport, de la Logistique et de l'Eau) but are administered by each commune. With the rate of paving for provincial roads at 45.9% (2005) and the rate of road access³ for rural populations at 54% (same year), the disparity between urban and rural regions was significant. Moreover, while the national poverty rate was 14.2% (2004), the poverty rates for urban and rural areas were 7.9% (same year) and 22% (same year), respectively. Therefore, the poverty rate in rural areas remained high and there was a strong need for infrastructure development in rural areas.

Japan has been assisting the development and improvement of rural roads in Morocco since it extended a Yen loan for "Road Improvement Project" in 1995. Major donors, such as the World Bank, have also supported the development and improvement of rural roads. In 2004, the Moroccan government established the Fund for Road Finance (Caisse pour le Financement Routier, hereinafter referred to as "CFR") to develop and maintain rural roads. Furthermore, for the purpose of development and expansion of rural roads, the Moroccan government secured government budget, Special Road Funds (Fonds Spécial Routier, hereinafter referred to as "FSR"), local government budget, domestic funds, such as Hassan II Fund, and funds from aid donors.

1.2 Project Outline

¹ As of December 2005.

² Direction des Routes in French

³ The rate of road access is defined by "the number of people living in the villages consisting of 50 or more households and located within 1 km of the project's roads divided by the total number of rural population."

The object of this project is to improve traffic access for the inhabitants of roadside communities in Morocco by developing and improving rural roads, thereby contributing to the improvement of living conditions and alleviation of regional disparities.

Loan Approved Amount/ Disbursed Amount	8,439 million yen / 8,439 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2008 / March, 2008
Terms and Conditions	Interest Rate 1.4% Repayment 25 years (Grace Period 7 years) Conditions for Procurement General Untied
Borrower/Executing Agency	Cash for Road Financing / the Ministry of Equipment, Transportation, Logistics and Water
Project Completion	March, 2017
Main Contractor (s)	-
Main Consultant (s)	-
Related Studies (Feasibility Studies, etc.)	Special Assistance for Project Formation (SAPROF) (October, 2007–February, 2008)
Related Projects	ODA Loan Projects “Road Improvement Project (March, 1995)” “Rural Road Improvement Project II (July, 2011)” Technical Cooperation Projects “Skhirat Road and Equipment Training Institute(IFEER) Program (1992–1997)” Group Training in the Third Country for “Capacity Enhancement for Road Maintenance Skills (1999–2003)” Group Training Course in the Third Country for “Road Maintenance and Technique, Phase 2 (2005–2010)” Group Training Course in the Third Country for “Road Maintenance and Management, Phase 3 (2009–2012)” ODA Grant Projects “The Project for the improvement of equipment of road maintenance and construction machine training center” (February, 2005) World Bank Second Rural Roads Project (December 2006, with supplemental financing in June 2014)

2. Outline of the Evaluation Study

2.1 External Evaluator

Takeshi Daimon, Waseda University

2.2 Duration of the Evaluation Study

This ex-post evaluation study was conducted based on the following schedule:

Duration of the study: December, 2016–December, 2017

Duration of the field study: March 20–April 1, 2017; July 3–July 8, 2017

2.3 Constraints during the Evaluation Study

At the time of the ex-post evaluation, a part of the NC roads, which were set for sub-projects, remained incomplete. These incomplete road sections are excluded from the evaluation as these sections account for less than 10% of the total target sections and are the sections added to the original plan. In terms of the overall outputs, more sections than the ones originally scheduled were developed. This exclusion does not affect the results of the evaluation.

3. Results of the Evaluation (Overall Rating: B⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Consistency with the Development Plan of Morocco

In its “Economic and Social Development Plan (2000–2004),” the Moroccan government stated that the alleviation of regional disparities, economic development of rural areas through rural road development, and improvement of traffic access for inhabitants in rural areas and remote places, were important issues, and the Moroccan government continued to maintain this policy at the time of the ex-post evaluation. Moreover, Morocco prepared the Second National Program of Rural Roads (PNRR2) (2005) under which it aimed to develop 15,500 km of rural roads by 2012. This project financed a portion of the PNRR2, which was also supported by the World Bank as it was relevant to Morocco’s development plan.

At the time of ex-post evaluation, the Moroccan government prepared the “Spatial and Social Disparities in Rural Areas Countermeasure Program”⁶ (2017–2022), a succeeding program of the PNRR2, under which it aimed to develop 33,000 km of rural roads up to the target year. The development of rural roads in Morocco was given high priority as a development policy and this project has been relevant to Morocco’s development plan.

3.1.2 Consistency with the Development Needs of Morocco

At the time of appraisal, more than 80% of Morocco’s major roads (highways, national roads, and regional roads) were paved. However, there was a conspicuous disparity between urban and rural areas, with a paving rate of 45.9% (2005) for provincial roads. It was recognized that the implementation of this project could aim to improve traffic access for the inhabitants of roadside communities, and there were needs to improve the living conditions and redress regional disparities. This project was co-financed with the World Bank. Coordinating

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ②: Fair, ①: Low

⁶ The original title is “PROGRAMME DE LUTTE CONTRE LES DISPARITÉS SPATIALES ET SOCIALES EN MILIEU RURAL. In fact, unlike previous PNRR, this program covers the development of other sectors, so does not focus on the road sector. However, the detail of this program was not published at the time of field work (March, 2017 and July, 2017).

with the CFR, areas with high needs were selected in terms of rates of return, access rate, and poverty rate, saving adjustment costs among donors. Moreover, the CFR's management of procurement provided accurate database on contract fulfillment of each road section and the investment timing was appropriate. PNRR2, which initially aimed to complete the project by 2015, reached 79% of its achievement rate by 2015. As regional disparities still remain, it was recognized that improved traffic access for the inhabitants of roadside communities was intended to be realized by developing and improving rural roads, and there were constant needs to improve the living conditions and redress regional disparities.

At the time of the ex-post evaluation, under the framework of PNRR2, the rate of road access improved in all the provinces⁷ in comparison to the rate of 2005. However, at the time of the ex-post evaluation, there was a gap among provinces in the rate of road access. Oued Eddhab province ranked the lowest at 38% and Cassablanca province ranked the highest at 95%. The needs to redress regional disparities continue to remain in the areas targeted by PNRR2.

3.1.3 Consistency with Japan's ODA Policy

This project was consistent with "An Infrastructure Improvement for Sustained Growth," "Poverty Reduction," and "Reducing regional disparities" in Morocco, stated in the Overseas Economic Cooperation Operations (April 2005).

3.1.4 Appropriateness of the Project Plan and Approach

At the time of planning, this project was scheduled to develop a total road length of 630.11 km (39 road sections). However, at the time of ex-post evaluation, 876.67 km (65 road sections) were developed. The volume of outputs increased. Confirming the inputs, outputs, and outcomes⁸, the project plan/approach was generally appropriate.

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

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

At the time of appraisal, this project aimed to develop and expand a total rural road length of 630.11 km (regional, provincial, and NC roads) in 9 provinces. However, at the time of ex-post evaluation, 876.67 km were developed and expanded in the 9 provinces, including Tanger where additional construction was ongoing. At the time of ex-post evaluation, among 65 road sections (which were complete at the time of the evaluation), 17 road sections were

⁷ Based on the documents provided by the DR.

⁸ Evaluated in terms of effectiveness and efficiency.

classified roads (regional and provincial roads) under the management of the DR and 52 sections were NC roads under the management of communes. The details of these 65 sections are mentioned below.

Table 1. Sub-project, Output Overview

Target Provinces	Plan (km)	Actual (km)	Difference
Tetouan	2 sections	9 sections *	+7 sections
	49.00	48.00	
		91.54 (7 sections added)	
Subtotal	49.00	139.54	+90.54 km
Tanger	1 section	1 section	Achieved original plan
	5.00	4.72 (completed but additional construction was ongoing; scheduled to be completed by the end of 2017)	-0.28 km
Chefchaouen	2 sections	2 sections	Achieved original plan
	35.00	35.88	+0.88 km
Sidi Kacem	3 sections	3 sections	Achieved original plan
	65.76	64.75	+0.01 km
		0.0 (4 sections (30.0 km) *added but construction did not begin.) (The date of commencement of the work was not determined.)	
Settat	3 sections	3 sections	Achieved original plan
	87.9	89.19	+1.29 km
El Jadida	14 sections	31 sections	+17 sections
	67.5	59.90	
		1 section cancelled, 1 section is scheduled to be completed in 2017.	
		123.92	
		20 sections added**	
		1 section under construction (scheduled to be completed in 2017)	
Subtotal	67.5	183.82	+116.32 km
Errachidia	11 sections	10 sections	-1 section
	214.95	173.50	
		20.58	
		2 sections cancelled, 1 section added.	

Subtotal	214.95	194.08	-20.87 km
Ouarzazate	2 sections	4 sections	+2 sections
	81.41	81.41	
		44.69	
		2 sections added **	
Subtotal	81.41	126.10	+44.69 km
Al Haouz	1 section	2 sections	+1 sections
	23.59	23.59	
		15.00	
		1 section added**	
Subtotal	23.59	38.59	+15.00 km
Total	630.11	876.67	+246. 56 km
	39 sections	65 sections complete	+26 sections

Source: Documents provided by the CFR

Note: * JICA approval on June, 2011; ** JICA approval on July, 2010; *** JICA approval on July, 2008.

These changes met the criteria that were agreed with the implementing agency

(①Conducting studies, such as D/D study, ②New roads' priority over existing roads,

③Providing information on land acquisition and resettlement) and JICA approved the change each time. Therefore, these changes did not cause issues for procedures. However, regarding incomplete road sections except for two sections already cancelled in Errachidia after the loan was provided, one section was cancelled in El Jadida, two sections were still under construction at the time of the ex-post evaluation, and additional four sections⁹ in Sidi Kacem did not begin. The DR is considered to have understood that a revision or abolition of road section plans do not have to necessarily be approved by JICA after the provision of loan.

The public engineering works consisted of simple pavement and gravel road maintenance. The differences between the time of appraisal and time of ex-post evaluation are as follows.

At the time of appraisal, the plan was ①Simple pavement: 22 sections, the total length of 400.48 km, a two-lane road (two lanes in total), width 6.0 m (road shoulders 1.0 m×2 included) and ②Gravel road maintenance: 18 sections, the total length of 229.64 km, a two-lane road (two lanes in total), width 6.0 m (road shoulders 1.0 m×2 included). At the time of ex-post evaluation, ①in simple pavement, the same sections, total length, and specifications were the same as those at the time of appraisal. However, ②in gravel road maintenance, the number of sections was 43 and the total length was 647.03 km (specifications were the same as those at the time of ex-ante evaluation). This project did not use consulting services.

3.2.2 Project Inputs

3.2.2.1 Project Cost

At the time of appraisal, the total project cost was expected to be 11,086 million yen (yen loan amount: 8,439 million yen (public engineering works); Moroccan Government: 2,647 million yen¹⁰ (indirect cost and other costs).

At the time of the ex-post evaluation, the total project cost was 9,976 million yen (yen loan amount: 8,439 million yen (public engineering works); Moroccan Government: 1,537 million yen¹¹ (indirect cost and other costs). As of July 2017, most of the road sections were completed, so these are the total costs.

The final total project cost was 9,976 million yen (90%) which was below the total project cost (11,086 million yen) estimated at the time of appraisal. As mentioned above, the total road length as output was 138% of the length set at the time of appraisal, but the value of the construction contracts was below the initial plan.

Therefore, the project cost was within the plan.

⁹ JICA approved that these four sections should be added on June 2011. However, the construction did not begin at the time of the project completion. A loan for these sections is not yet decided. The CFR sought a loan within a project succeeding this project (Rural Road Improvement Project II, a loan signed on July 2011) (based on the interview).

¹⁰ 189 million MAD. Exchange rate at the time of the evaluation: 1MAD=14.0 yen.

¹¹ 135 million MAD. Based on the calculation of 1 MAD=11.35 yen (average exchange rate during the project period; truncating numbers of decimals).

3.2.2.2 Project Period

At the time of appraisal, the project period was 4 years and 4 months (52 months) from the time of signing the loan agreement (March 2008) up to the time of completing the project including one-year guarantee period (June 2012, including 1-year guarantee period). However, at the time of the ex-post evaluation, as the construction in seven sections (one section in Tanger, two sections in El Jadida, and four sections in Sidi Kacem) did not begin or remains incomplete, this project has not yet ended. Therefore, the accurate project period is unclear.

However, (as of July 2017) when the second field study was conducted for the ex-post evaluation, 9 years and 5 months (114 months) (219% of the value at the time of appraisal) have passed since the time of signing the loan agreement. Therefore, the project period was significantly longer than the planned period.

3.2.3 Results of Calculations for Internal Rates of Return (references only)

Due to the nature of the project of not making financial revenues, such as toll receipts, the financial internal rate of return (FIRR) was not calculated at the time of the appraisal. On the other hand, at the time of the appraisal, the economic internal rate of return (EIRR) was 15.8% based on the following premises:

Cost: Public engineering works cost (excluding taxes), operation and maintenance expense (for the purpose of convenience, operation, and maintenance was computed as “0.”¹²)

This expense was small in comparison to public engineering works cost.)

Benefit: Total benefits from the total shortening of travel time for car users

Project Life: 10 years

While re-computing the EIRR at the time of the ex-post evaluation, as a matter of convenience, a reduced average travel cost (between before and after PNRR2) calculated by Team Maroc (a consulting firm) in a study on PNRR2 in 2012 was used as the benefit of each road. Due to the fact that the actual value to the car users based on the type of car transport and on the section was not available, it was multiplied by the ratio 3:1, which is the ratio of passenger cars to commercial cars in vehicle registrations.

Table 2. Average Transportation Costs (MAD/km)

	2005	2012	Reduce
Per passenger	0.80	0.59	0.21
Per ton of cargo	2.61	2.14	0.47
Per carrier	1.70	1.54	0.16

Source: Study conducted by Team Maroc (2012).

¹² Estimation that operation and maintenance expense can be 0 for 10–20 years after the commencement of the project as a small expense is not appropriate. However, it was supposed as 0 to ensure consistency with the estimation at the time of appraisal.

However, when the actual measured value of traffic volume (Table 3) was used, the EIRR was negative 1.8%. Supposing that the project life is 15 or 20 years in the same estimate, the EIRR was, at best, 3.9% and 6.1%, respectively. In order to gain a similar EIRR computed at the time of appraisal, the simulation results showed that the project life should be set at 20 years and the traffic volume should be doubled.

However, in this calculation (following the calculation at the time of appraisal), operation and maintenance expense was assumed as “0.” If the operation and maintenance expense is included, the EIRR is revised downward.¹³ However, the EIRR with operation and maintenance expense was not re-computed for the purpose of comparison on the same level of operation and maintenance expense at the time of appraisal.

In light of the above, although the project cost was consistent with the increased outputs (within the plan), the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.3 Effectiveness¹⁴ (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

① Annual Average Daily Traffic (hereinafter referred to as AADT)

The baseline value of all the 39 sections at the time of appraisal (2007) were 40–400 vehicles/day depending on the section, totaling to 3,680 vehicles/day. The target value (1 year after the project completion) in 2013 was 88–804 vehicles/day depending on the section, totaling to 7,739 vehicles/day (increase of 210% in the total value).¹⁵

These values were set for the 39 road sections initially targeted at the time of appraisal. These 39 sections can be used to compare the actual measurement value (2017). However, among these sections, the actual value for only 25 sections was available, as shown below (Table 3), due to reasons such as cancellation, suspension, termination, and delay. Also, the sections whose target values are over 80% are with the mark of *.

Table 3. Target Subprojects AADT (Vehicles/Day)

Provinces	Road ID	Road Section	Baseline 2007	Target 2013	Actual 2017
Al Haouz	P2117	S-RAHAL / TOUAMA	70	144	291*
Chefchaouen	NC3079	Souk El had - Bab Hamma	100	225	370*
Chefchaouen	NC6006	Bab Taza-B.Fagloulm	400	745	750*

¹³ If operation and maintenance expense is 3% of the public engineering works cost, the EIRR can be -8.4% (project life: 10 years), -1.2% (15 years), and 1.8% (20 years).

¹⁴ Rating is based on the evaluation of the project effectiveness as well as its impact.

¹⁵ The documents provided by JICA states that AADT for NC roads “is just the estimate value and not accurate.” The AADT effectiveness indicators (the baseline value) of NC roads are considered to be an estimated value as there was no record of renewing these indicators at the time of appraisal. At the time of appraisal, it was totaled due to restrictions on data. Following this computation, the total value is used for comparison.

El jadida	NC	P2131-Dr Lahcinat Old Taleb	50	96	90*
El jadida	NC	P3414-P3465 Par Dr Laababda	50	96	85*
El jadida	NC10	P3419-8012 Par Laamarna Lakramia	50	96	120*
El jadida	NC7127	P3459-Dior Chaab Old Rahmoun	50	96	85*
El jadida	NC	R320 -Douar Louta	50	96	100*
El jadida	NC	R320- Douar Lamkhatra	50	96	100*
El jadida	NC	R316- P3429 par Lahnanta et Lamoualda	50	171	85
El jadida	NC2016	Krabba-Laachichat	50	105	90*
El jadida	NC	P3409 - Dr Jouabra	50	105	70
El jadida	NC	R301-Dr Old Youssef	50	96	80*
El jadida	NC8010	P3413- olad Azooz -idguaba-P2302	50	96	100*
El jadida	NC	Dr Old Said -Dr Lahmarsa	50	96	80*
Ouarzazate	P1507	Taznakhte-Tarmigt	50	96	75*
Ouarzazate	P1506	Telouat-Tabouraht	70	144	200*
Settat	P3612	Berrechid à RP 3619	150	338	350*
Settat	P3612	Travaux d'achèvement de la liaison Berrechid- RP3619	120	187	362*
Settat	P3630	Aïn Blal à Beni Khloug	400	804	350
Settat	P3624	Settat à Mrizigue	150	309	262*
Sidi Kacem	P4518	Had Kourt - Jorf El Melha	150	309	126
Tanger	NC8107	Assilah-Dar seid	150	198	50-150
Tetouan	NC14211	Bghaghza - Spirada (Construction)	150	206	500*
Tetouan	NC15004	Beni Idder - Beni Imrane	50	173	150*
Total of the 25 Sections			2,630	5,123	4,871

Source: Documents provided by the DR.

Note: * Section having a value over 80% of the target value. When the actual value in a section was confirmed, the value was included in this table.

20 out of the 25 road sections reached over 80% of the target value and the status of the AADT achievement was relatively high in terms of the number of sections, which exceeded the target value. Even sections which were under the target value exceeded the AADT of the baseline year, except for a section in Settat. Therefore, it can be assumed that road development contributed to induced traffic volume.¹⁶

② The number of inhabitants of roadside communities (population)

The baseline value at the time of appraisal (2007) was 276–19,486 depending on the section, totaling to a population of 109,905. The target value was 292–19,515, depending on the section, 1 year after the project completion, totaling to a population of 113,513 (approximately 3% increase in 6 years).

At the time of appraisal, the population of the roadside inhabitants in 39 road sections was reported¹⁷. However, while checking at the time of the ex-post evaluation, the baseline value at the time of appraisal was confirmed to be an estimate value. Considering this reason, the target value set at the time of appraisal became meaningless. For example, the baseline value (estimate value) of NC3079, a road in Chefchaouen, was 898 at the time of appraisal, but the

¹⁶ However, the induced traffic volume cannot at all times be the only factor for increased traffic. In addition to induced traffic volume, development traffic volume and conversion traffic volume would have an influence.

¹⁷ Table 4 is based on 39 sections which was provided with information among all the sections targeted by this project..

real value was 1,240. Considering this situation, without mentioning the initial target population value of 983, a comparison with the baseline value is shown in this report

Table 4. Target Sub-projects, The Number of Inhabitants of Roadside Communities (population)

Provinces	Sections	Baseline 2007	Actual 2017
Al Haouz	1	2,496	2,600
Chefchaouen	3	6,684	8,022
El jadida	12	21,180	26,471
Errachidia	9	33,777	33,777
Ouarzazate	4	36,000	42,000
Settat	4	49,805	58,000
Sidi Kacem	3	11,720	12,545
Tanger	1	878	878
Tetouan	2	16,000	23,000
Total	39	177,662	206,415

Source: Documents provided by the DR.

The statistical figures in Errachidia are the same and their accuracy cannot be confirmed. Excluding Errachidia, the figure of population increased to 120%¹⁸ from the time of appraisal and the population of 143,885 increased to 172,638. Therefore, as initially planned, traffic access for roadside inhabitants achieved proximately 6% increase. However, the number of inhabitants cannot be used as an effectiveness indicator as other factors, such as the natural population growth, not attributable to the impact of road development alone, could have been influential.

③ Annual traffic cut-off days caused by natural disasters (day/year)

At the time of appraisal, 4–60 days/year, depending on the section, was set for the baseline value (2007). 0 days/year was set for all sections for 1 year after the project completion.

Table 5. Target Subprojects, Annual Traffic Cut-off Days Caused by Natural Disasters (Day/Year)

Provinces	Sections	Baseline 2007	Target 2013	Actual 2017
Al Haouz	2	7	0	0
Chefchaouen	3	90	0	0
Ouarzazate	6	215	0	4
Settat	5	24	0	0
Sidi Kacem	3	11	0	1
Tanger	1	60	0	3
Tetouan	12	990	0	0

Source: Documents provided by the DR.

¹⁸ For reference, the ratio of the estimated baseline value at the time of appraisal and the target value is 182%.

When the target value was set at 0 day/year for all the sections including additional sections, 24 sections (89% of the total sections) achieved the target (except for 3 sections) in the 27 sections whose data was available (see annex 2).

3.3.2 Qualitative Effects (Other Effects)

The qualitative effects expected at the time of appraisal were an increase of maintained road access after project completion.¹⁹ The project also aimed to achieve 80% of the nationwide access rate at the time of the PNRR2 completion.²⁰

A part of the road sections continued to be incomplete at the time of the ex-post evaluation. Although all the sections were not complete, this project completed over 80% of the sections by the end of 2013. Considering this reason, the actual value in 2016 can be used for the evaluation analysis. As of 2016, the national average of the access rate was 79.3%. At the time of PNRR2 completion, this project largely achieved its objective.

This project has largely achieved its objective in each target province. Even when the value was lower than the target value, there were no provinces with a value of 5 or lower than the target value, except for Sidi Kacem.

Table 6. Rate of Road Access

Provinces	Baseline 2005	Target 2015	Actual 2016
Al Houz	40%	69%	66%
Chefchauen	24%	60%	60%
El Jadida	54%	80%	77%
Errachidia	52%	90%	89%
Ouarzazate	55%	80%	79%
Settat	40%	74%	70%
Sidi Kacem	59%	76%	71%
Tanger	52%	70%	70%
Tetouan	30%	73%	69%
Nationwide	54%	80%	79.3%

Source: Documents provided by the DR.

In light of the above, among the effectiveness indicators, ① in terms of the AADT, which is a quantitative effect, the target value was mostly achieved. ② In terms of the roadside population, an increase was observed but the achievement was not confirmed as the baseline value was an estimated value. Roadside population cannot be used as an effectiveness indicator as it does not necessarily reflect the direct impact attributable to the project alone. ③ In terms of the annual traffic cut-off days, the target value was mostly achieved. Moreover, in terms of the rate of road access, which is a qualitative effect, the target value at the time of appraisal was mostly achieved. Therefore, the effectiveness of the project is high.

¹⁹ See footnote 2 for the definition of road access rate.

²⁰ Documents provided by JICA.

3.4 Impacts

3.4.1 Intended Impacts

3.4.1.1 Quantitative Effects

At the time of appraisal, the improvement of poverty rate in the nine provinces targeted by this project was set as an impact (a quantitative effect). Based on a study targeting the period between 2005 and 2006, the poverty rate (weighted average) in the 9 provinces was 25.6%, which was higher than the national average (14.2%). The poverty rate in each province was Tetouan (37.7%)²¹, Tanger (33.4%), Chefchaouen (39.1%), Sidi Kacem (22.6%), Settat (15.8%), El Jadida (20.6%), Errachidia (30.3%), Ouarzazate (23.9%), and Al Haouz (25.6%).

The latest published poverty profile by province and commune was implemented in 2007 after the project implementation.²² Aside from the poverty survey, a family income and expenditure survey was conducted in 2014. A part of this survey was published²³ and its summary results are shown below.

Table 7. Transition of Poverty Rate by Region²⁴ (Urban and Rural Areas)

	2001	2007	2014
Urban Areas	7.4%	4.9%	1.6%
Rural Areas	25.1%	14.4%	9.5%
National Average	15.3%	8.9%	4.8%

Source: Poverty Profile (2007) and Family Income and Expenditure Survey (2014) conducted by the Moroccan Government.

The results show that the poverty rate decreased from 14.4% in 2007 to 9.5% in 2014 in the rural areas targeted by the PNRR2. The poverty rate also decreased in all the regions, including the regions targeted by this project (the official statistics started to use “region” as a unit since 2011 when decentralization began).

Table 8. Poverty Rate Transition by Region Targeted by this Project

	2001	2007	2014
Draa-Tafilalet	40.3%	n/a	14.6%
Marrakesh-Safi	20.2%	11.2%	5.4%
Oriental	18.2%	10.1%	5.3%
Sous-Massa	16.7%	12.7%	5.1%
Fes-Meknes	16.6%	9.5%	5.2%
Rabat-Sale-Kenitra	15.5%	5.1%	3.8%

²¹ Documents provided by JICA.

²² http://www.hcp.ma/Indicateurs-communaux-de-la-pauvrete-de-la-vulnerabilite-et-de-l-inegalite_a670.html (accessed on April 19, 2017).

²³ Présentation des résultats de l'Enquête Nationale sur la Consommation et les Dépenses des ménages 2013/2014 (2016.10). The detailed information was not published.

²⁴ The poverty line in 2014 (poverty line based on income level, 4667MAD (urban) (≈2.6USD, Conversion of Purchasing Power Parity) 4312MAD (rural) (≈2.4USD, Conversion of Purchasing Power Parity)) is used. The poverty rate in 2001 and 2007 uses the same income level (the detailed information for the poverty line in each year was not included in the above-mentioned source).

Beni Mellal-Khenifra	14.4%	n/a	9.3%
Tanger-Tetouan-Al Hoceima	11.5%	7.8%	2.2%
Settat-Casablanca	6.9%	3.2%	2.0%
Three Southern Regions (El Dakha-Ouet Ed Dahab, Laayoun-Saguia Al Hamra, Guelmin-Oued Noun) *	6.0%	n/a	3.3%

Source: Poverty Profile (2007) and Family Income and Expenditure Survey (2014) conducted by the Moroccan Government.

Note: Under-populated areas (desert areas) were aggregated in three Southern Regions.

The provinces targeted by the yen loan project were not the only targets as shown above, but the poverty rate decreased by half from 2007 (at the time of the project commencement) in all the regions (rural areas) covered by the PNRR2.

In light of the above, the poverty rate continued to decrease at the time of the ex-post evaluation. The poverty rate decreased by half in 3 out of the 10 regions, using the baseline value at the time of appraisal (2007) and the value in 2014. In comparison to the data in 2001, the poverty rate generally decreased by half in all the regions. Taking this into account, the project is likely to have the intended impacts (onset of effect). However, it is not possible to determine that the poverty reduction is attributable to the pure impact of this project as other possible factors, such as wage increases with economic recovery may exist.

3.4.1.2 Qualitative Effects

At the time of appraisal, the contribution to ①poverty reduction (the non-income-based poor not captured by the above quantitative effects), ②development and facilitation of the rural economy by securing effective road transport, ③improvement of rural resident's standard of living, and ④remedy of the disparity between regions were considered to be qualitative impacts.

For the improvement of rural resident's standard of living (③), improvement of the unemployment rate (i.e. employment opportunities and income growth) can be effective. The data for each province (targeted by the project) for 2014 was available, but the time-series data (before and after the project) for each province for comparison was not published. Considering this reason, unemployment rates are compared by gender, and by urban and rural areas (Table 9). The poverty rate temporarily decreased from the baseline year to 2010, but increased up to 2014.

In comparison to the national average of unemployment rate, the unemployment rate (not considering sex) improved in all the provinces. However, the female unemployment rates in Sidi Kacem, Settat, Al Houz, and Errachidia were higher in comparison to the national average (Table 10). This situation did not improve at the time of the ex-post evaluation. Therefore, the impact of road development on the unemployment rate improvement was not confirmed.

Table 9. Unemployment Rate (By Gender, and Urban and Rural Areas) (%)

	Baseline Year 2008	2010	2014
Nationwide (Male)	9.5	8.9	9.7
(Female)	9.8	9.6	10.4
Urban Areas (Male)	13.0	12.1	12.8
(Female)	20.3	19.8	21.9
Rural Areas (Male)	5.1	4.8	5.4
(Female)	1.8	2.0	1.8

Source: Documents provided by the DR.

Table 10. Unemployment Rate (By Gender and Province) (%) (2014)

	Male	Female	Average
Ouarzazate	10.0	20.2	12.3
Sidi Kacem	10.8	42.5	14.8
Settat	9.4	34.8	13.1
Al Haouz	6.5	31.1	9.2
El Jadida	8.5	24.2	11.6
Errachidia	11.2	41.1	15.8
Chefchauen	6.1	15.4	7.9
Tanger	12.8	21.2	15.1
Tetouan	n/a	n/a	n/a
National Average	12.4	29.6	16.2

Source: Website of the Moroccan's Government²⁵.

Considering the remedy of the disparity between regions (④), the inequality index (change over time) on the target provinces were not published. Instead, the Gini coefficient²⁶ at the national level is used here. As Table 12 shows, the Gini coefficient marginally decreased at the national level, also suggesting that not a little disparity between urban and rural areas continued to remain. The improvement was not considered to be undertaken at the time of the ex-post evaluation. Therefore, the impact of road development on the disparity between regions was not confirmed.

Table 12. Gini Coefficient (Inequality Index) (%)

	2001	2007	2014
Nationwide	40.6%	40.7%	39.5%
Urban Areas	39%	n/a	n/a
Rural Areas	32%	n/a	n/a

Source: Documents provided by the DR.

Poverty reduction based on non-income aspects (①), and development and facilitation on the rural economy by securing effective road transport (②) were not specific to the road sections targeted by this project and were considered as reference only. The school enrollment rate of students in ages appropriate for elementary and junior high school (6–14 years old) increased from 58.8% to 66.0% or increased at 7.2% after the PNRR2. It was found that the

²⁵ <http://rgphentableaux.hcp.ma/Default1/> (accessed on April 19, 2017)

²⁶ The Gini coefficient is the index of inequality. Closer the index is to 0, the more equitable it is.

rate of female students in particular increased from 62.1% to 66.8% or increased at 4.7% and the frequency of visit to health facilities increased from 6.9 times to 8.7 times or increased at 4.7%. These results are consistent with the reduced time required to access schools and health facilities, also suggesting that road improvement improved non-income-based poverty.

Table 13. Qualitative Effect Indicators

Indicators	2005	2012
Non-Agricultural Workers (Person/douar)	19.8	24.5
Product Commercialization Rate (%)*	35.6	37.4
School Enrollment Rate (6–14 years old) (%)	58.8	66.0
Female Students	62.1	66.8
Time required to access to schools (minutes): Winter	42	35
Same as Above: Summer: Summer	39	31
Time required to access to neighboring health facilities (minutes): Winter	69	45
Same as Above: Summer	55	39
Frequency of visit to health facilities (times)	6.9	8.7
Transportation Business: Average Travel Distance (km)**	26,305	29,454
Same as Above: Average of Working Days (day)	249	268
Same as Above: Average of Annual Sales (MAD)	73,642	83,887
The number of traffic accidents (Person)	0.1	1.4

Source: Study conducted by Team Maroc (2012).

Note: * Rate of households running business for agricultural products and other products by the unit of household and selling on the distribution channel. Agricultural products account for 61.5% and other products account for 43.6%.

**Annual Average Travel Distance per Carrier

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

At the time of appraisal, among road sector stipulated regulations of “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (2002), this project was confirmed to not make any major violation. It was then confirmed that this project was not likely to have significant adverse impact on the environment. The preparation of an Environmental Impact Assessment (EIA) for this project was not obligatory under Moroccan domestic law, and the project area was not in or near areas that were sensitive to impacts, such as national parks; thus, undesirable impact on the natural environment was assumed to be minimal. Nonetheless, the DR was expected to determine whether an EIA is implemented based on the results of the Preliminary Environmental Assessment. In the event that an EIA was determined to be unnecessary, the Regional and Provincial Department of Equipment, Transportation and Logistics (la Direction Régionale de l’Équipement, du Transport et de la Logistique, hereinafter referred to as DRETL) and la Direction Provinciale de l’Équipement, du Transport et de la Logistique (hereinafter referred to as DPETL) were expected to prepare a simplified environmental management plan and specify the content of environmental measures construction contractors should implement during construction of the project. At the same time, the DRETL/DPETL were expected to monitor the air quality, water quality, and noise during construction.

Based on the visit to the project sites and interview with the DRETL/DPETL at the time of the ex-post evaluation, an EIA was not obligatory and the impact on the natural environment was not reported in most of the cases as assumed at the time of appraisal. Moreover, it was confirmed that contractors effectively implemented preventive measures such as anti-environmental-pollution measures stipulated in a simplified environmental plan during construction, and that it was effectively monitored by the DRETL/DPETL. According to the monitoring, it was also confirmed that there was no impact on the environment.

3 . 4 . 2 . 2 Land Acquisition and Resident Relocation

No land acquisition or resident relocation was planned as this was a project to pave and develop existing unpaved and underdeveloped roads. If land acquisition or resident relocation occurred in the basic design or detailed design for any of the roads, steps for acquisition and relocation were expected to be taken in accordance with Morocco's domestic procedures at the time of appraisal.

Based on the visit to the project sites and interview with the DR and DRETL/DPETL at the time of the ex-post evaluation, resident relocation did not occur as this was a project to expand and rehabilitate existing roads. If an existing road had to be expanded, residents were expected to provide their land to the land owner, namely the government. Most of the residents provided a part of the land, following the procedures of domestic law. However, in some of the sections developed²⁷, the width remained shorter than 6.0 m, which was set in the design as some of the land owners refused to provide land to avoid land violation as a result of road expansion. The sections using gravel road maintenance and the total length increased, but this increase had no negative impact on the environment and society.

3 . 4 . 2 . 3 Unintended Positive/Negative Impact

A detailed study, including quantitative and qualitative analyses, was conducted to evaluate the existence of the impact and its extent of this project on gender empowerment, while it was not planned at the time of appraisal.

Column A detailed study on gender empowerment

Targeting the road areas developed by PNRR2,²⁸ a quantitative analysis²⁹ was conducted, using the dataset based on the household survey (2012) covering school enrollment rate and prenatal checkups. This analysis aimed to test the following hypotheses:

²⁷ Based on the visit to the NC roads in El Jadida. However, the DPETL (El Jadida) does not have detailed data on the length of these sections.

²⁸ While one road section targeted by this project was included, the other sections were not the target areas of this yen loan project. Therefore, this quantitative analysis is only an additional analysis.

²⁹ Ordinary least squares (OLS), logit, and mediation analysis were employed.

(Hypothesis 1) Means of public transportation, such as bus services, would be created by road development, and these means would provide students with opportunities to economically commute to farther schools. As a result, the more advanced the school grades are, it results in a higher female students' school enrollment rate in the project target areas.

(Hypothesis 2) Road development would increase access to means of public transportation, and the prenatal checkup frequency of pregnant women would increase by economically better access to health facilities.

The results of the analysis did not show a statistical significance for Hypothesis 1. However, the status of road development and frequency of visit to neighboring communal health centers or provincial health centers were statistically significant in Hypothesis 2 (frequency of visit to these health facilities increased in the areas where the roads were developed), when considering travel cost to access health centers by distance and also by time as mediator variables. On the other hand, access to hospitals and clinics outside the areas was not statistically significant (in the areas where the roads were developed, the correlation with frequency of visit to these health facilities were not confirmed).

Conversations with the inhabitants, mainly women, of roadside communities were also arranged in El Jadida and Settat. The participatory approach considered discussions on beneficial effects of the roads. Furthermore, an interview survey on the beneficial effects was conducted by visiting roadside rural health facilities, and elementary and junior high schools. The following statements show some of the information collected during the interviews:

“Now good teachers can come to the elementary school because of the improved access to the central major roads.” (A representative in a commune of El Jadida)

“It is difficult for girls to commute to the junior high school because the school is 3 km away.” (A woman in El Jadida)

“At the elementary school, students are replaced by 25 male and female students in the morning and afternoon. There are no lights, water, and toilets.” (A principal of an elementary school in Settat)

“An ambulance can come because of the road improvement, but it is not easy to use after all, because tips (1MAD for 1 km) have to be paid to the driver.” (A woman in Settat)

“A prenatal checkup is available but giving birth is only possible at a hospital 16 km away.” (A nurse at a communal health center in El Jadida)

“After the road was developed, my transportation and work became easier.” (A woman in Settat)

“Even when a road is developed, students cannot go to the school if it rains. The high school enrollment rate of female students is low because of the accessibility to the high school only by taxi.” (A principal of a junior high school in El Jadida)

As shown above, road improvement contributed to improving daily living. However, the results of the analysis did not support road improvement directly, leading to a significant improvement on the school enrollment rate of female students and on the hospital visit frequency of pregnant woman.



Interview near the road



Market (souq) near the road



Health center near the road



An inhabitant on the road

As shown above, rural road improvement by this project made a certain contribution to the social development and poverty reduction, while not particularly having a positive impact on gender empowerment. The positive impact on women in particular was not confirmed.

Moreover, considering road transportation, the time required to access schools and health facilities decreased as Table 13 shows. A significant improvement was observed in carrier's average travel distance, average working days, and average annual sales. The carrier's annual average travel distance increased by approximately 25% and the annual average working days increased by approximately 19 days. Accordingly, the average annual sales per business operator increased by 10,245 MAD (approximately 14%). Road development decreased the average transportation costs per ton of cargo as Table 2 shows. This improvement was possible owing to the beneficial effects of road development.

At the time of the ex-post evaluation, the number of workers in the fields, except agriculture business (monoculture farming), increased after the road development, and occupational diversification was promoted as a positive impact, while these results were not planned at the time of appraisal. However, there was also a negative impact.³⁰ Owing to reasons, such as excessive speed, the number of traffic accidents was 14 times higher, increasing from 0.1 person/year for sectional average to 1.4. Among 68,458 annual accidents (2013),³¹ 3,705 people died and 10,993 people were seriously injured. As a result of the improvement of the road access rate, based on the field work, ambulances were able to pass through the roads, which was not possible previously, and more patients gained access to immediate care. While the improvement was observed, the escalation of accidents from the perspectives of quantity and quality is becoming an issue. The lack of traffic education, road signs, and traffic mirrors, for the prevention of traffic accidents, is considered to be a cause of this situation.

As described above, the decrease in poverty rate after the implementation of this project in the target provinces is predicted as an impact. The qualitative impacts assumed at the time of appraisal were not confirmed. The positive impacts, such as occupational diversification, were confirmed, while they were not expected at the time of appraisal. Therefore, the impact of the project is high.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

³⁰ Documents provided by the DR.

³¹ Based on "Le METL en chiffres (2014)," the latest publication, including the project sites.

For operation and maintenance of this project, the DRETL/DPETL were expected to manage regional roads and provincial roads, and communes were expected to manage NC roads. The total number of staff at the Ministry of Equipment, Transportation, Logistics and Water was 3,686 (as of January, 2008), and the staff size was considered to be sufficient for operation and maintenance of roads targeted by this project at the time of appraisal. However, the staff size at the communes in charge of NC roads was unclear at the time of appraisal.

At the time of the ex-post evaluation, it was confirmed that the institutional aspects of operation and maintenance remained almost same as planned and expected at the time of appraisal. The total number of staff at the ministry was 6,569³² (as of January, 2016) (of which the staff at the Ministry accounted for 32% and the other staff including the staff at the DRTEL/DPTTEL accounted for 68%). The number of high-ranking officials was 1,369, the number of staff in the middle management level was 2,888, and the staff in the field offices was 2,312. The staff size for operation and maintenance of regional and provincial roads (non-NC roads) developed by this project was larger than the one at the time of appraisal. Therefore, the staff size was sufficient. The director at the DRTEL/DPTTEL was expected to make decisions on road operation and maintenance. Therefore, it was clear where the responsibility lay.

On the other hand, the project left NC roads, which the communes were expected to manage, entirely to the communes. It all depends, but based on the visit to the project sites and the interview with the DPTTEL, the staff size and its institution in charge of operation and maintenance were not sufficient in most of the cases. Also, each commune had different decision making and locus of responsibility, and generalization was not possible. Moreover, no prospect of future improvement for this situation was planned. According to the report on examination published (in April, 2017) by the Board of Audit in Morocco,³³ NC roads face the crisis that “national property of roads would be disgraced or lost, because the state and the local autonomy failed to maintain them after the road development.”

In light of the above, the reality is that NC roads cannot benefit from the institutional aspects of operation and maintenance such as the DRTEL/DPTTEL, unless they are classified or upgraded to regional or provincial roads. Therefore, no major problems have been observed in terms of the institutional aspect for regional and provincial roads, but major problems have been observed in the institutional aspect for NC roads whose operation and maintenance was supposed to be managed by communes.

3.5.2 Technical Aspects of Operation and Maintenance

³² Website of the Ministry of Equipment, Transport, Logistics and Water <http://www.equipement.gov.ma/Formation/Chiffres-cles/Pages/Chiffre-Cle-RH.aspx> (accessed on August 17, 2017).

³³ Audit Report in 2015 by Court of Audit (published on April, 2017) <http://www.courdescomptes.ma/fr/Page-27/publications/rapport-annuel/rapport-de-la-cour-des-comptes-pour-l-annee-2015/1-189/> (accessed on August 17, 2017).

At the time of appraisal, the section of infrastructure (in charge of roads) and section of facilities in the DRTEL/DPTTEL were in charge of regional and provincial roads. At each DRTEL/DPTTEL, 3 to 10 engineers (university graduates; national qualification), 7 to 19 technicians, and 21 to 66 clerks were assigned. At the time of the ex-post evaluation, based on the visit to the project sites and the interview with the implementing agency, it is confirmed that the engineers, technicians, and clerks were assigned as planned. The manual, including operation procedure of heavy machinery, was developed and used.

On the other hand, at each commune in charge of NC roads, the plan at the time of appraisal expected that there would be a specialized section (engineering division) to operate and maintain roads and public facilities. In the section, three to four officials and one vehicle for monitoring were expected to be assigned for road operation and maintenance. However, based on the interview with the DRTEL/DPTTEL and communes, under the existing conditions, there were not many communes with this section and staff. In reality, only ad hoc operation and maintenance was possible in case where repair was required. Moreover, there were not many communes possessing heavy machinery, and the manual for operation and maintenance could not be found at the communes.

At the time of appraisal, Japan established the IFEER (l'Institut de Formation aux Engins et à l'Entretien Routier)³⁴ by Japan's grand projects and technical cooperation projects³⁵ to train engineers and technicians, and approximately 250 persons were expected to participate in the training session annually. The IFEER is in charge of the education for engineers and technicians at the DR, accepting third country training mainly from African countries. The IFEER has had a record (accumulated total) of training 11,842 people between 1993, which is the year of foundation, and 2012. The annual average number of people trained was 1,184. The training covered skills on road maintenance and repair (attended by 48% of the accumulated total trainees), skills on heavy machinery operation (30%), training for technicians (14%), and business administration (8%).

However, in reality, only the engineers and technicians at the DRTEL/DPTTEL participated in these training courses in most of the cases. There were almost no participants from the communes.³⁶

³⁴ See the following website for the contents of the training:

<http://www.equipment.gov.ma/routier/Infrastructures-Routieres/IFEER/Pages/Missions.aspx> (accessed on August 16, 2017)

³⁵ ODA Grant Projects "The Project for the improvement of equipment of IFEER in Morocco" (E/N signed on February, 2005, 0.328 billion yen). Technical Cooperation Projects (Former Project-Type Technical Cooperation) "Institut de Formation aux Engins et à l'Entretien Routier Skhirat (IFEER) Program (1992-1997)," Group Training in the Third Country for "Capacity Enhancement for Road Maintenance Skills (1999-2003)," Group Training Course in the Third Country for "Road Maintenance and Construction Equipment in IFEER, Phase 2 (2005-2010)," Group Training Course in the Third Country for "Road Maintenance and Construction Equipment, Phase 3 (2009-2011)."

³⁶ Based on the interview with the DR and DPTTEL.

In light of the above, no major problems have been observed in the technical aspect for regional and provincial roads, but major problems have been observed in terms of the technical aspect for NC roads managed by communes.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of appraisal, the general account budget and Special Road Funds (FSR) were expected to finance the budget for the regional and provincial roads. The budget amount for road operation and maintenance in 2007 was 965 million MAD (approximately 13.51 billion yen), including 190 million MAD (approximately 2.66 billion yen) from the general account budget and 775 million MAD (approximately 10.85 billion yen) from the FSR. The budget from the FSR accounted for approximately 80% of the total budget. The FSR was a Moroccan special-purpose budget financed by taxes, such as gasoline tax, car registration tax, and car weight tax, being established in 1989.

On the other hand, it was planned that communes would finance the budget for NC roads. The budget was expected to be made from its own funds, such as resident tax, borrowing from funds in local governments and subsidies from the Ministry of Interior. Based on the estimation by the SAPROF, approximately 10% of the overall annual revenue totaling 6,100 million MAD (approximately 85.4 billion yen) in 1,298 communes in Morocco was disbursed to road maintenance. While local governments' funding for NC roads maintenance was not sufficient, it was expected to be supported by regular reports on the development of decentralization and transition of financial conditions.

In light of the above, at the time of appraisal, no major problems have been observed in the financial aspect of the operation and maintenance system.

At the time of the ex-post evaluation, it was confirmed that the budget for operation and maintenance of the regional and provincial roads was financed by the FSR and the general account budget as planned at the time of appraisal. Table 12 shows the FSR and the general account budget (except for labor cost) for the past 4 years. The FSR budget which accounted for 80% of the operation and maintenance cost increased, and the budget was higher than the one estimated at the time of appraisal. The budget for operation and maintenance of the regional and provincial roads was sufficient.

Table 12. FSR and the General Account Budget (For Operation and Maintenance) (Unit: million MAD)

	2014	2015	2016	2017
FSR	2,200	2,200	2,500	2,700
General Account	155	223	237	508

Source: Website of the Moroccan Ministry of Economy and Finance.

Note: Financial year and calendar year are the same. The general account budget is the disbursement for operation and maintenance except for labor cost. The FSR includes expenses

except operation and maintenance cost, such as contribution to the CFR. A detailed breakdown of expenses is not published.

In light of the above, the financial aspects and budget for the regional and provincial roads were as planned at the time of appraisal, and no particular problems have been observed. On the other hand, some problems have been observed for NC roads. There were not sufficient budgets for NC roads, which were under the management of the communes and there were no available data.

3.5.4 Current Status of Operation and Maintenance

At the time of appraisal, there was a past record of yen loan project, “Road Improvement Project (approved in 1995, completed in 2003),” at the DRTEL/DPTTEL and communes, and there was no major problems observed. Therefore, operation and maintenance of the project were expected to be managed appropriately.

At the time of the ex-post evaluation, the status of operation and maintenance for regional and provincial roads was marked on a scale of A to D. If the mark of a road was lower than C the road was considered as a target for intensive repair and maintenance. On the other hand, in principle, communes were not obliged to submit a report on NC roads, which were under the management of communes, to the DRTEL/DPTTEL. However, for important roads, the DRTEL/DPTTEL voluntarily evaluated the status and ranked them on a scale of A to D. In the ex-post evaluation, in El Jadida, whose rating of the status of operation and maintenance was not reported, 28 road sections were rated on a scale of A to D with the help of technicians and engineers at the DRTEL/DPTTEL (Table 13).

Among 50 sections except for 15 sections, mainly NC roads, with unclear status of operation and maintenance among 65 roads that were completed, 46 road sections (92% of the total) were rated either A or B. The roads rated as C or below C, which indicates a need of repair, accounts for only 8%, while the maintenance of the NC roads was inadequate or completely missing. There was no road with the worst status (rated as D).

Most of the NC roads were gravel road maintenance, based on the visit to NC roads in El Jadida. There was relatively limited traffic, and heavy vehicles, such as trucks did not pass often. As a result, while maintenance was not sufficient in the sections 5 years after the completion, there were no roads in need of immediate repair, supporting the observation.

Table 13. Rating on the Status of Operation and Maintenance

	A	B	C	D	不明
Tetouan	0	0	0	0	9
Tanger	1	0	0	0	0
Chefchauen	0	0	2	0	0
Sidi Kacem	2	0	1	0	0
Settat	3	0	0	0	0

El Jadida	5	21	1	0	4
Errachidia	9	0	0	0	1
Ouarzazate	4	0	0	0	0
Al Haouz	0	1	0	0	1
Total	24	22	4	0	15

Source: DR (except for El Jadida) and visit to the project sites (El Jadida).

Regional and provincial roads under the direct management of the DR were sufficiently maintained by regular inspection and repair, but NC roads under the management of the communes were not sufficiently maintained. However, even in the sections 5 years after the completion of NC roads, there were no roads in need of immediate repair, and it was satisfactory overall. However, when the roads are left without maintenance, it is not possible to address issues in the future when repair is demanded.³⁷ Therefore, the status of operation and maintenance is fair.

As described above, for regional and provincial roads, the status of operation and maintenance in the institutional, technical, and financial aspects was appropriate as planned at the time of appraisal. However, for NC roads under the management of the communes, there are some problems in terms of institutional, technical, and financial aspects. These issues were expected at the time of appraisal, but it can be said that appropriate measures were not taken by the executing agency. The possible appropriate measures for the future were not planned at the time of the ex-post evaluation. Therefore, sustainability of the project effects is low for the NC roads.

Taking these into account there are no particular problems about the institutional, technical, and financial aspects, and current status of the operation and maintenance system of the regional and provincial roads of this project. On the other hand, there are some problems in terms of the institutional, technical, and financial aspects of the NC roads. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned, and Recommendations

4.1 Conclusion

This project aimed to develop a portion of 15,500 km of rural roads, based on “The Second National Program of Rural Roads (PNRR2)” (2005–2015) laid down by the Moroccan Government. It aimed to improve traffic access for the inhabitants of roadside communities, improve the living conditions, and redress regional disparities by developing and improving rural roads. This project has been highly relevant to Morocco’s development policy and needs as well as Japan’s ODA policy. Therefore, its relevance is high. Although the project cost was

³⁷ Considering 10 years and 15 years post the completion, the road surface and bed could get worse by accumulating axial loads as well as increased traffic.

consistent with increased outputs (within the plan), the project period exceeded the plan. Therefore, the efficiency of the project is fair. Among the effectiveness indicators, the annual average daily traffic mostly reached the target value, and the road cut-off dates and access rates also mostly achieved the target set for the evaluation. Moreover, the poverty rate in rural areas and school enrollment rate (particularly the enrollment rate for girls) improved subsequent to this project. The frequency of visits to health facilities marginally improved, and the operating distance and sales of transportation companies improved. However, traffic accidents increased after the implementation of PNRR2. Taking into account these findings, the effectiveness and impact of the project are high. While operation and maintenance in terms of institutional, technical, and financial aspects are high in regional and provincial roads, non-classified roads administered by communes continue to have issues to address. Taken together, that sustainability of the project in regional and provincial roads are high and some problems have been observed in non-classified roads, the sustainability of the project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

① Accident-prevention Measures

Road signs are not thoroughly set up on the regional and provincial roads under the management of the DR, let alone NC roads under the management of the communes. Excessive speed and lack of traffic rules/manners are also the causes of rapid increase in the number of traffic accidents, including fatal accidents. It is recommended that the DR prepare an action plan, as accident-prevention measures, on the enforcement of traffic rules/manners (heavier penalties and enlightenment activities), while cooperating with the national police agency and the military police, and also with schools in rural areas and communes in some cases. The action plan should be prepared by the end of 2017 when a succeeding program to the PNRR2 is expected to begin and this plan should be organized as major policies in the program and budgeted.

② Measures for the Operation and Maintenance of NC roads (Database Building and Upgrading)

The database for NC roads under the management of communes is not yet built by the DR, the status of these roads is sufficiently unclear, and the operation and maintenance is not sufficient. This recognition is shared with the DR. It is recommended that NC roads be upgraded to regional and provincial roads, the database be built in the DR, and the operation and maintenance of the road should be under the direct management. By the end of 2017, at the latest, the arrangement of this upgrading should be undertaken in order to ensure budgeting in the following year. However, though decentralization started in 2011, the authority on road

projects is being transferred to state governments.³⁸ A number of NC roads are now under the management of state governments in terms of budget and personnel for the operation and maintenance. In the future, state governments should take responsibility to build the database on former NC roads (which are upgraded to regional and provincial roads) and to monitor them closely. Indicators used in monitoring could cover traffic volume, status of operation and maintenance, repair (contents and frequency), financial return and the status of road.

4.2.2 Recommendations to JICA

This project was co-financed by multiple donors for the PNRR2, including the World Bank. It could be valuable, if a comprehensive evaluation is conducted on the support of PNRR2 provided by all the donors involved aside from the individual evaluation on the aid effectiveness of the yen loan project. The World Bank has been playing a central role in donor co-ordination. As the World Bank is expected to conduct an ex-post evaluation after its provision of loan to the PNRR2 is completed by the end of July 2017, it is necessary to continue sharing information with the World Bank.

4.3 Lessons Learned

① Appropriate Project Supervision in Sector Investment-type Yen Loan (Small-scale and fragmented)

In the vast numbers of small-scale and fragmented sector investment, it is necessary to undertake project management as a whole and also to undertake individual subproject management. The central authority cannot at all times manage vast numbers of subprojects. In this project, it was necessary to gain an approval from JICA before a subproject was added or cancelled. However, in reality, some road sections targeted by the loan were ignored without maintenance at the time of completion of the loan provision. Some sections were ended without maintenance after the provision of the loan. A procedure of gaining an approval from JICA was not taken because it was cancellation after provision of the loan. In order to avoid these problems of project management and also to undertake management considering regional characteristics and unique circumstances for subprojects, provincial governments should play a central role. Based on the status of the maintenance, the feedback system in procurement management should be built. On the other hand, the central authority should continue to implement reporting systems from regions for project management as a whole. For major indicators, the database on all roads should be built.

② Necessity for Component of Technical Cooperation (Employment of Consultants)

³⁸ Audit by Cour des Comptes (2017) raised the same issue and also suggested the same.

This project conducted the SAPROF and Japanese consultants has been involved in the project since the preparation stage. However, procurement management was delegated to Morocco, and tracking of progress and procurement management in this yen loan project became unclear, as mentioned above. These problems can be avoided if the consultants for execution management of a yen loan project reside in the field in sector investment-type yen loan.

Aside from financial assistance, the component of technical cooperation should have been implemented which could have contributed to capacity building on procurement management of rural roads which cannot be reached by the central government. Donors, such as the World Bank, have provided technical cooperation component,³⁹ aside from financial assistance. In case of this project, the technical cooperation from the World Bank covered sections, including the project sites, but it was not specialized in this project. As a result, this project received relatively low benefits from the World Bank's technical cooperation. For this reason, technical cooperation could have been included in the yen loan or employment of consultants was possible and desirable.

③ Perspective on Future Project

There may be no progress to promote the aid effectiveness of rural road improvement if donors count on a developing country's self-help to conduct their activities, including exiting agency's measures on accident-prevention, road classification, and database building. Therefore, it should be supplemented by donors' technical assistance in the measures related to these areas to be taken for rural road improvement, which contributes to the improvement of the aid effectiveness. In regard to this point, JICA will be able to provide technical cooperation projects through a scheme that combines dispatch of experts and training.

³⁹ Each donor provides different technical cooperation. In the case of the World Bank, a technical cooperation on standardization of road specifications and design was conducted by introducing highway design and development model (HDM).

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
① Project outputs	Target provinces: 9 provinces Total length: 630.11 km Road sections: 39 sections ① Simple pavement: 22 sections, a two-lane road, width 6.0 m ② Gravel road maintenance: 18 sections, a two-lane road, width 6.0 m	Target provinces: As planned Total length: 876.67 km Road sections: 65 sections ① Simple pavement: As planned ② Gravel road maintenance: 43 sections, the specifications were as planned.
② Project Period	March 2008–June 2012 (52 months)	March 2008–March 2017 (109 months)
③ Project Cost Amount paid in foreign currency Amount paid in local currency Total ODA loan portion Exchange rate	8,439 million yen 2,647 million yen (189 million MAD) 11,086 million yen 8,439 million yen 1MAD = 14.0 yen (as of December 2007)	8,439 million yen 1,537 million yen (135 million MAD) 9,9766 million yen 8,439 million yen 1MAD = 11.35 yen (average between March 2008 and March 2017)
④ Final Disbursement	January 2015	

<End>

Annex 1. Target subprojects, inhabitants of roadside communities (population)

Provinces	Road ID	Road Section	Baseline 2007	Actual 2017
Al Haouz	P2117	S-RAHAL / TOUAMA	2,496	2,600
Chefchaouen	NC3079	Souk El had - Bab Hamma	1,240	1,488
Chefchaouen	NC6006	Bab Taza-B.Fagloun(lot1)	3,362	4,035
Chefchaouen	NC6006	Bab Taza-B.Fagloun(lot2)	2,082	2,499
El jadida	NC	P2131-Dr Lahcinat Old Taleb	2,258	2,822
El jadida	NC	P3414-P3465 Par Dr Laababda	1,870	2,337
El jadida	NC10	P3419-8012 Par Laamarna Lakramia	3,201	4,001
El jadida	NC7127	P3459-Dior Chaab Old Rahmoun	1,554	1,942
El jadida	NC	R320 -Douar Louta	2,300	2,875
El jadida	NC	R320- Douar Lamkhatra	2,244	2,805
El jadida	NC	R316- P3429 par Lahnanta et Lamoualda	1,550	1,937
El jadida	NC2016	Krabba -Laachichat	1,668	2,085
El jadida	NC	P3409 - Dr Jouabra	1,085	1,356
El jadida	NC	R301-Dr Old Youssef	975	1,218
El jadida	NC8010	P3413- olad Azooz -idguaba-P2302	1,155	1,443
El jadida	NC	Dr Old Said -Dr Lahmarsa	1,320	1,650
Errachidia	R702	Arfoud-Merzouga	1,336	1,336
Errachidia	NC	Aoufous-Zaouit Aoufous	750	750
Errachidia	P7110	Macissi-Oum Jrane	2,421	2,421
Errachidia	A	ASRIR RN10 PK 557- Limite Province Dr	9,526	9,526
Errachidia	2583	RN10 – Tizouggarine	4,359	4,359
Errachidia	R703	Bouzmou-Aït Hani	11,737	11,737
Errachidia	NC	RN13- Ksours Tillicht	2,062	2,062
Errachidia	2605	P7101 – Lhroun	895	895
Errachidia	NC	RN10 - Ksar tarda	691	691
Ouarzazate	P1507	Taznakhte-Tarmigt (Lot 1)	5,000	6,000
Ouarzazate	P1507	Taznakhte-Tarmigt (Lot 2)	5,000	6,000
Ouarzazate	P1506	Telouat-Tabouraht (Lot 1)	13,000	15,000
Ouarzazate	P1506	Telouat-Tabouraht (Lot 2)	13,000	15,000
Settat	P3612	Berrechid à RP 3619	6,652	8,500
Settat	P3630	Aïn Blal à Beni Khlog	15,425	17,000
Settat	P3624	Settat à Mrizigue (Lot1)	8,724	10,000
Settat	P3624	Settat à Mrizigue (Lot2)	12,352	14,000
Sidi Kacem	P4518	Had Kourt - Jorf El Melha	4,150	4,358
Sidi Kacem	P4540	Azib Siltane - Sidi Abdelaziz	5,278	5,542
Sidi Kacem	P4527	Chemin d'accès à M'zefroune	2,292	2,645
Tanger	NC8107	Assilah-Dar seïd	878	878
Tetouan	NC14211	Bghaghza – Spirada	10,000	16,000
Tetouan	NC1500 4	Beni Idder - Beni Imrane	6,000	7,000
		Total	177,662	206,415
		Total (Except for Errachdia)	143,885	172,638

Source: Documents provided by the DR.

Annex 2. Target subprojects, annual traffic cut-off days caused by natural disasters (days/year)

Provinces	Road ID	Road Section	Baseline 2007	Target 2013	Actual 2017
Al Haouz	NC	Ouzgita-Ameghras*	4	0	0
Al Haouz	P2117	S-RAHAL / TOUAMA	3	0	0
Chefchaouen	NC3079	Souk El had - Bab Hamma	30	0	0
Chefchaouen	NC6006	Bab Taza-B.Fagloun(lot1)	30	0	0
Chefchaouen	NC6006	Bab Taza-B.Fagloun(lot2)	30	0	0
Ouarzazate	P1507	Taznakhte-Tarmigt	25	0	2
Ouarzazate	P1501	Asdif-Iznagen*	30	0	0
Ouarzazate	P1502	Alamdoun-Ait Toumert*	15	0	0
Ouarzazate	P1506	Telouat-Tabouraht	60	0	0
Settat	P3612	Berrechid à RP 3619	4	0	0
Settat	P3630	Ain Blal à Beni Khलग	6	0	0
Settat	P3624	Settat à Mrizigue	5	0	0
Sidi Kacem	P4518	Had Kourt - Jorf El Melha	4	0	1
Sidi Kacem	P4540	Azib Siltane - Sidi Abdelaziz	4	0	0
Sidi Kacem	P4527	Chemin d'accès à M'zefroune	3	0	0
Tanger	NC8107	Assilah-Dar seid	60	0	3
Tetouan	NC14211	Bghaghza - Spirada	90	0	0
Tetouan	NC	Azla - Mokdassen*	60	0	0
Tetouan	NC	RN 2 - RP4702 par Bni Wassim*	90	0	0
Tetouan	NC	RN2 - Fechkara (2eme Section)*	90	0	0
Tetouan	NC	RP4105 - Ihdounen par Drabna *	90	0	0
Tetouan	NC	Travaux d'achèvement de la liaison RN2 – Fechkara PAR AIN ALEK *	90	0	0
Tetouan	NC	Travaux d'achèvement de la liaison RP4105 - Ihdounen par Drabna*	90	0	0
Tetouan	NC	Saddena - Al Ounsar RP4702*	60	0	0
Tetouan	NC	Bni Idder - Kh Achiche*	60	0	0
Tetouan	NC	Jbel Lahbib - Kharoub / Zaitouna*	90	0	0
Tetouan	NC15004	Beni Idder - Beni Imrane	90	0	0

Source: Documents provided by the DR.

Note: * sections added (12 sections)