Completion Report

Project Number: 37066-043
Loan Number: 2445
July 2016

India: Rural Roads Sector II Investment Program (Project 3)

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – Indian rupee/s (Re/Rs)

		At Appraisal (31 October 2005)	At Project Completion (30 June 2013)
Rs1.00	=	$0.022	$0.0168
$1.00	=	Rs44.995	Rs59.544

ABBREVIATIONS

ADB	–	Asian Development Bank
ASRB	–	Assam State Road Board
CPF	–	community participation framework
EAF	–	environmental assessment and review framework
ECOP	–	environment code of practice
EIRR	–	economic internal rate of return
FFA	–	framework financing agreement
IEE	–	initial environmental examination
km	–	kilometer
LIBOR	–	London interbank offered rate
LCV	–	light commercial vehicle
m	–	meter
MCV	–	medium commercial vehicle
MFF	–	multitranche financing facility
MORD	–	Ministry of Rural Development
NCB	–	national competitive bidding
NRRDA	–	National Rural Roads Development Agency
PCR	–	project completion review
PFR	–	periodic financing request
PIC	–	project implementation consultant
PIU	–	project implementation unit
PMGSY	–	*Pradhan Mantri Gram SadhakYojana* (Prime Minister's Rural Roads Program)
SARD	–	South Asia Department, ADB
SRRDA	–	State Rural Roads Development Agency
TOR	–	terms of reference
TSC	–	technical support consultant
VOC	–	vehicle operating cost

GLOSSARY

gram sewaks	–	village-level officers
haats	–	markets
sarpanch	–	the democratically-elected head of a village statutory institution of local self-government
zilla panchayats	–	village or small-town governments

NOTES

(i) The fiscal year (FY) of the Government of India and its state governments ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2016 ends on 31 March 2016.

(ii) In this report, "$" refers to US dollars.

Vice-President	W. Zhang, Operations 1
Director General	H. Kim, South Asia Department (SARD)
Director	H. Yamaguchi, Transport and Communications Division, SARD
Team leader	A. Heriawan, Transport Specialist, SARD
Team member	K. Estrella, Associate Project Analyst, SARD

CONTENTS

BASIC DATA

A. Loan Identification

1.	Country	India
2.	Loan Number	Loan 2445-IND
3.	Project Title	Rural Roads Sector II Investment Program (Project 3)
4.	Borrower	India
5.	Executing Agency	Ministry of Rural Development at the central government level; governments of West Bengal and Assam at the state level
6.	Amount of Loan	$130.00 million
7.	Project Completion Report Number	IND 1578

B. Loan Data

1.	Appraisal	
	– Date Started	1 August 2005
	– Date Completed	5 August 2005
2.	Loan Negotiations	
	– Date Started	17 September 2008
	– Date Completed	17 September 2008
3.	Date of Board Approval	26 September 2008
4.	Date of Loan Agreement	10 November 2008
5.	Date of Loan Effectiveness	
	– In Loan Agreement	8 February 2009
	– Actual	5 January 2009
	– Number of Extensions	none
6.	Closing Date	
	– In Loan Agreement	31 December 2010
	– Actual	30 June 2013
	– Number of Extensions	4
7.	Terms of Loan	
	– Interest Rate	London interbank offered rate-based
	– Commitment Charge	0.15%
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
	– Front-End Fee	none

8. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
23 January 2009	12 November 2013	58 months
Effective Date	**Original Closing Date**	**Time Interval**
5 January 2009	31 December 2010	24 months

b. Amount ($ million)

Category	Original Allocation	Last Revised Allocation[a]	Amount Increased/ (Canceled)	Amount Disbursed	Undisbursed Balance
1. Goods and Works	130.00	121.73	-8.27	121.73	0
Total	**130.00**	**121.73**	**-8.27**	**121.73**	**0**

Note: The first partial loan cancellation of $3.00 million was made on 21 December 2012. The second partial loan cancellation of $5.27 million was made on 12 August 2013.
[a] The last loan allocation was made on 12 August 2013.

9. Local Costs (Financed)
   - Amount ($ million) 0.00
   - Percentage of Local Costs 0.00
   - Percentage of Total Cost 0.00

C. Project Data

1. Project Cost ($ million)

Cost	Appraisal Estimate	Actual
Foreign Currency Cost		
Local Currency Cost		
Total	**168.80**	**178.32**

Note: At project preparation in 2008, the project cost was not estimated by foreign currency and local currency.

2. Financing Plan ($ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	33.30	54.29
ADB Financed	130.00	121.73
Total	**163.30**	**176.02**
Financial Charges[a]		
Borrower Financed	5.50	2.30
ADB Financed	0.00	0.00
Total	**5.50**	**2.30**

[a] Includes interest during construction and commitment fees.
ADB = Asian Development Bank.

3. Cost Breakdown by Project Component ($ million)

Component	Appraisal Estimate	Actual
Road Connectivity Component	163.30	176.02
Financial Charges	5.50	2.30
Total	**168.80**	**178.32**

4. Project Schedule

Item	Appraisal Estimate	Actual
Assam		
Procurement of civil works contracts	Q1 2008–Q4 2008	Q1 2008–Q2 2012
Civil works	Q3 2008–Q2 2010	Q1 2009–Q4 2013
West Bengal		
Procurement of civil works contracts	Q1 2008–Q4 2008	Q1 2008–Q2 2012
Civil works	Q1 2009–Q2 2010	Q1 2009–Q2 2013

Q = quarter.

5. Project Performance Report Ratings

	Ratings	
Implementation Period	**Development Objectives**	**Implementation Progress**
From 26 September to 31 December 2008	Satisfactory	Satisfactory
From 1 January to 31 December 2009	Satisfactory	Satisfactory
From 1 January to 30 September 2010	Satisfactory	Highly Satisfactory
From 1 October to 31 December 2010	Satisfactory	Satisfactory
From 1 January to 31 December 2011		On track[a]
From 1 January to 31 December 2012		On track
From 1 January to 31 December 2013		On track

[a] Based on new project performance ratings in eOperations.

Source: Asian Development Bank. 2011. Project Performance Monitoring. *Project Administration Instructions.* Manila (PAI No. 5.08).

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
Fact-finding for the MFF	18 April–17 May 2005	9	135	t, i, t, p, j, f, s, i, d
MFF appraisal	1–5 August 2005	4	20	t, j, e, a
Inception*	10–18 November 2008， 5–11 December 2008	6	96	t, s, t, a, p, s
Review 1*	4–13 February 2009	5	50	t, t, p, s, e
Review 2*	27 July–26 August 2009	6	180	t, t, s, p, s, e
Review 3*	14 November–2 December 2009	5	90	t, s, a, p, s
Review 4*	2–20 December 2010	6	91	t, t, k, p, s, e
Review 5*	27 January–7 February 2011	6	31	t, t, p, s, e, s
Project completion review	26–30 October 2015	5	10	t, a

a = analyst, c = consultant, d = director, e = environment specialist, f = financial specialist, h = economist, i = project implementation, j = counsel, k = control officer, MFF = multitranche financing facility, p = procurement, s = social and/or resettlement specialist, t = transport specialist.

*Combined with missions for other projects under the investment program.

I. PROJECT DESCRIPTION

1. Inadequate road connectivity has been an obstacle to economic growth in rural India. To address this issue, the Government of India established the Prime Minister's Rural Roads Program (PMGSY) in 2000. This national program identified more than 170,000 eligible habitations, and improved about 738,000 kilometers (km) of rural roads at a total estimated cost of about $30 billion.[1] The budget required for the PMGSY from 2006 to 2010 was estimated at $11 billion, 40% of which would be funded by the government and 7% from committed assistance from development partners such as the Asian Development Bank (ADB) and the World Bank. Funding sources for the remaining 53% were not initially identified. After the first ADB loan, the government requested further ADB assistance for the PMGSY under a new lending instrument—the multitranche financing facility (MFF).[2] Following the provisions of the framework financing agreement (FFA) for the Rural Roads Sector II Investment Program, ADB approved the first loan of $180.00 million on 31 July 2006 (Project 1) and the second loan of $77.65 million on 17 March 2008 (Project 2).[3] The executing agencies were the Ministry of Rural Development (MORD) at the central level, and the state governments at the state level. The implementing agencies were the state rural roads development agencies (SRRDAs).

2. This project is the third loan financed under the investment program. In response to the government's periodic financing request (PFR) dated 24 June 2008, ADB approved a $130 million loan on 26 September 2008 to finance the construction and upgrading of 950 km of rural roads in Assam and 720 km of rural roads in West Bengal. The total project cost was estimated at $162 million, of which 80.2% would be financed by the ADB loan and 19.8% by the government fund. The expected outcome was improved connectivity between rural communities and markets, district headquarters, and other centers of economic activity via the investment program roads. The expected impacts were the reduction of poverty and deprivation, and the economic growth of the communities connected by the investment program roads. The project was expected to be completed by 30 June 2010 and the loan was expected to close by 31 December 2010.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

3. At appraisal, the project was formulated as part of the investment program supporting the PMGSY's implementation by the government. The project's scope was defined with clear indicators in keeping with the government's annual targets, and implemented using well-structured standard operating procedures and practices approved for projects under the PMGSY. Program sustainability was increased through the strengthening of the capacity of state agencies for project planning and design, management oversight for construction activities, social and environmental safeguards, procurement and contract management, and fiduciary arrangements.

4. In line with the government's priorities supporting high, equitable, and pro-poor

[1] A habitation, a unit used in the PMGSY, is a distinct population cluster with houses, occupying an area, and having a local name. In rural areas, a village (revenue village) may include one or more habitations. Government of India, Ministry of Rural Development (Rural Connectivity Division). 2006. *PMGSY Briefing Book*. Delhi.

[2] ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Rural Roads Sector I Project*. Manila (approved on 20 November 2003 for a total of $400.00 million, and completed in June 2009).

[3] India and ADB signed the FFA on 25 November 2005.

economic growth, ADB's assistance to India supported infrastructure-led poverty reduction. The investment program focused strategically on helping the poor by providing connectivity in the states that met the program's requirements. Under Projects 1 and 2, 3,941 km of rural roads were constructed or upgraded, considerably improving connectivity in the project areas and bringing about significant socioeconomic impacts. These projects made extensive use of consulting services to support the successful implementation of, and capacity building on, rural road development and maintenance. The project continued to provide road connectivity in the project states, which had large rural populations and lacked adequate coverage in terms of all-weather roads.

5. During and after implementation, the project was deemed *relevant* to the government's objectives and policies under the PMGSY, as well as ADB's country strategy.[4] Subprojects were selected based on the PMGSY criteria and consultation with the affected communities prior to road construction using the community participation framework (CPF) included in the FFA.[5] At completion, 1,707.59 km of all-weather rural roads had been constructed or upgraded, considerably improving connectivity in the project area (paras. 6 and 29) and yielding significant socioeconomic impacts that directly benefited about 1.28 million people. Despite a longer implementation period (paras. 12–14), the project scope generally aligned with the original design, and the project objectives anticipated at appraisal were substantially achieved. The project outputs and outcomes met the government's objectives and were in line with ADB's country strategy. The design and monitoring framework of the project, with the corresponding achievements, is in Appendix 1.

B. Project Outputs

6. At project preparation,[6] it was anticipated that a total of 1,670 km of rural roads would be constructed or upgraded, including 950 km in Assam and 720 km in West Bengal.[7] During implementation, a total of 258 road subprojects corresponding to 1,892.4 km were sanctioned following the selection criteria specified in the FFA, which were developed on the basis of the PMGSY guidelines. However, 10 subprojects were not successfully procured or implemented, and so were excluded from the project scope (para. 7). At completion, a total of 1,707.59 km of rural roads had been constructed or upgraded—900.00 km in Assam and 807.59 km in West Bengal. Civil works included (i) the construction and/or upgrading of rural roads to full single-lane cross-sections with a 3.5 meter (m) roadway and 7.5 m formation width with a bitumen surface, (ii) the strengthening of existing culverts and bridges, (iii) the construction of new bridges and cross-drainage structures, and (iv) the provision of road furniture and safety facilities. Concrete pavement was constructed for the village or habitation sections. The project roads connected 1,009 habitations and benefited about 1.28 million people in the project area. The project roads and habitations connected are detailed in Appendix 2. Community participation was ensured by consulting with all affected communities in keeping with the CPF, and grievance redress mechanisms were in place during project implementation. No complaints were received from the affected communities.

7. During implementation, the project scope was changed as follows:

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[4] ADB. 2004. *Country Strategy and Program Update (2005–2007): India*. Manila.

[5] The selection criteria for the subprojects under the MFF covered 12 aspects, including engineering, social issues, cost-efficiency, land requirements, environmental concerns, counterpart funds, and government approvals.

[6] The project appraisal for the entire investment program was carried out in 2005. Project 3 was prepared in 2008.

[7] ADB. 2008. *Project Administration Memorandum: Rural Roads Sector II Investment Program (Project 3)—States of Assam and West Bengal in India*. Manila.

(i) Three subprojects in Assam were dropped due to the unavailability of land and environmental issues (para. 39). Due to the non-execution of these packages, a partial loan cancellation in the amount of $3 million was approved.
(ii) Seven subprojects were dropped in West Bengal due to non-receipt of tenders, even after the seventh call.

8. As required in the contracts, the contractors implemented quality control of civil works with supervision from the project implementation units (PIUs). National and state quality monitors also inspected the project roads regularly. The ADB project completion review (PCR) mission in October 2015 observed that (i) the completed roads were generally of good quality, (ii) the roughness of the road surface generally met the design specifications and was within the acceptable range on the international roughness index (as indicated by the comfortable ride during the site visit), (iii) road safety features were installed on most of the project roads, and (iv) routine maintenance of the project roads was in place (para. 34).

C. Project Costs

9. During project preparation, the total project cost was estimated at $168.80 million, which only covered the road connectivity component and financial charges. The consulting services were financed by other ongoing loans under the MFF. Upon completion, the total actual project cost was $178.32 million equivalent—5.6% higher than estimated at project preparation, mainly due to higher contract prices. The total financial charges for the ADB loan, including interest during construction and commitment charges, fell from $5.50 million to $2.30 million as the actual interest rate was lower than expected. Appendix 3 compares the project costs at preparation and completion in detail.

10. Under the financing plan envisaged at project preparation, the project was to be financed by an ADB loan of $130 million (77% of the total project cost) and by the government in the amount of $23 million equivalent (23% of the total project cost). The ADB loan was from its ordinary capital resources under its London interbank offered rate (LIBOR)-based lending facility with a 25-year term, including a 5-year grace period and 0.15% commitment charge. The government fund was released by the central government, through the MORD, to the state governments on a grant basis. Due to partial loan cancellations (para. 11), only $121.73 million of the ADB loan was utilized. The government fully financed the civil works completed after loan closing. At completion, the ADB loan absorbed 68.3% of the total project cost, and the government share absorbed 31.7%. Appendix 3 compares the project financing at preparation and completion in detail.

D. Disbursements

11. The ADB loan was approved on 26 September 2008, was signed on 10 November 2008, and became effective on 5 January 2009. The loan proceeds were disbursed according to the ADB *Loan Disbursement Handbook* (2007, as amended from time to time). As specified in the loan agreement, the loan financed 80% of the goods and civil works expenditures. The statement of expenditure procedure was used to reimburse eligible expenditures. To facilitate project implementation, ADB approved retroactive financing on 10 November 2007. The first loan disbursement was made in January 2009. The ADB mission in November 2009 found that the loan disbursement progress in West Bengal was on track, exceeding projections. However, the actual loan disbursement in Assam was significantly lower than projected. The MORD and the National Rural Roads Development Agency (NRRDA) fielded a mission to Assam to

investigate. The ADB mission in February 2011 visited Assam separately and attributed the slow loan disbursement to certain implementation issues (para. 13). To mitigate this problem, the ADB mission recommended that the state create a separate account for ADB projects to facilitate better financial management and avoid the slow disbursement of funds. To compensate for time lost, ADB approved four extensions of the loan closing date, from the original date of 30 December 2010 to 30 June 2013.[8] As three subprojects in Assam were dropped, $3 million of the loan was cancelled on 21 December 2012. Before loan closing, the NRRDA carefully estimated the loan requirements according to actual project implementation and requested a second partial loan cancellation in the amount of $5.27 million. This request was approved on 12 August 2013. By the actual loan closing date on 19 November 2013, $121.73 million (93.6% of the original loan amount) had been disbursed. The annual projected and actual disbursements under the loan are in Appendix 4.

E. Project Schedule

12. During preparation, the project was planned to be implemented over 2.5 years, including implementation under retroactive financing, and expected to be completed by 30 June 2010. For the subprojects in Assam, contracts involving multiple roads or those located in remote areas were allowed a contract period of 18–24 months. To expedite project implementation, ADB approved advance procurement action and retroactive financing. When the loan became effective in January 2009, most civil works contracts in Assam and West Bengal had already been awarded (para. 21). However, some of the contracts could not be awarded due to non-receipt of tenders after several calls. The project implementation schedule was also affected by the parliamentary elections and the 2009 monsoon.

13. A number of subprojects were significantly delayed, especially in Assam. Reasons for this included land and security issues, an unusually long and intensive rainy season in 2010 (March–November), unavailability of materials in some states, bridge constructions (some bridges were financed by the government alone and had to be constructed one by one), and the rebidding of some contracts. The Assam State Road Board (ASRB) took measures to overcome these problems, including the financial and administrative aspects. As of 30 June 2010, 970.2 km of roads had been completed (52% of the target). At the request of the government, ADB extended the loan closing date by 1 year, expecting that all subprojects would be completed by the end of 2011.

14. As a result of these joint efforts, project performance in Assam had improved slightly in the second half of 2010. In 2011, implementation progress was generally on schedule for West Bengal, but was continuously slow for Assam. When the NRRDA fielded another mission to Assam, it learned that the slow implementation in the state had been further hampered by the imposition of the Model Code of Conduct around March–April 2011 due to the upcoming state elections, and that the project would not be completed by the extended loan closing date.[9] To facilitate the completion of all subprojects, ADB approved another three extensions of the loan closing date. By the final loan closing date of 30 June 2013, all subprojects in West Bengal had been completed and most in Assam were substantially completed. The government fully financed all outstanding subprojects covering the remaining project length. During the ADB PCR mission in October 2015, 59.74 km of rural roads from 22 packages were still being constructed.

[8] The loan closing date was extended from the original date of 31 December 2010, to 31 December 2011, 30 June 2012, 31 December 2012, and 30 June 2013.

[9] The Model Code of Conduct restricts government bodies from performing any recruitment activities, including procurement during the electoral process.

The actual project implementation schedule is in Appendix 5, and a chronology of major events is in Appendix 6.

F. Implementation Arrangements

15. As for all projects under the PMGSY, the executing agencies for the project were the MORD at the central level and the state governments at the state level. The MORD, with technical and management support from the NRRDA, remained responsible for overall project supervision and execution. During implementation, the coordination committee, chaired by the MORD joint secretary and comprising representatives from relevant agencies, met on a regular basis to monitor the use of the loan and overall implementation performance. At the state level, the project was coordinated by the standing committee established for the PMGSY's implementation, involving senior officials of the project department and the Finance, Forest, and Revenue Departments, among others.

16. The implementing agencies for the project were the ASRB and West Bengal State Rural Development Agency. The ASRB implemented subprojects in 26 districts in Assam, and the West Bengal State Rural Development Agency implemented subprojects in 18 districts in West Bengal through the district-level PIUs in accordance with the PMGSY guidelines. The Assam PIU was led by a superintending engineer, and the West Bengal PIU was led by an executive engineer; both were staffed with assistant or junior engineers, cashiers, and other supporting staff. The PIUs were adequately empowered to make effective and timely decisions on project implementation issues. With their own resources and local consultants, the PIUs prepared detailed project reports for the subprojects, implemented the CPF to mitigate social impacts, and implemented the environmental assessment framework (EAF) and relevant provisions of the environment codes of practice (ECOP). After project completion, the PIUs are responsible for managing road maintenance, including inspecting road conditions, procuring contractors, managing finances, and coordinating with local governments. This implementation arrangement was sufficient to deliver the project outputs. The organizational structure for project implementation is in Appendix 7.

17. In addition, the technical support consultant (TSC) worked at the central level to conduct safeguard due diligence and impact monitoring, prepare project progress reports, and provide other services for all projects under the investment program according to the terms of reference (TOR). Each project state engaged project implementation consultants (PIC) to implement the provisions of the CPF, EAF, and ECOP for the subprojects. The TSC and PICs were both financed by other ongoing projects under the MFF.

G. Conditions and Covenants

18. The borrower complied with loan conditions and covenants, including subproject selection, procurement and contract management, financial management, environment and social safeguards, road safety, and maintenance. An institutional framework for implementing the PMGSY projects was well established and functional. The executing and implementing agencies at both central and state levels implemented the project activities efficiently with due diligence in all aspects, and in accordance with the PMGSY guidelines. All loan covenants concerning environmental and social safeguards were complied with. Consolidated project progress reports were submitted to ADB. The MORD and the project states maintained separate financial accounts. Chartered accountants audited the financial accounts and statements and the executing agency submitted the audited financial reports to ADB. However, some of these reports were not submitted promptly; land was not immediately available for

some subprojects, delaying project implementation; and socioeconomic impact monitoring was not carried out after 2009.

19. The loan covenants also required the project roads to be properly maintained with sufficient funds. The civil works contracts awarded required the contractors to maintain the roads for 5 years post-construction in accordance with the PMGSY guidelines (para. 34). This liability period having passed, the project states are responsible for road maintenance. In keeping with the PMGSY guidelines, the state governments are taking steps to build capacity in the designated *zilla panchayats* (village or small-town governments), and the PIUs should remain responsible for maintenance until the *zilla panchayats* are able to take over road maintenance functions. The *zilla panchayats* in the project states participate in maintenance planning and comment on the prioritization of maintenance activities and projects. Appendix 8 summarizes the status of compliance with project's key loan covenants.

H. Consultant Recruitment and Procurement

20. As envisaged at project preparation, the TSC was engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2002, as amended from time to time). The first TSC was originally engaged in 2007 for Project 1.[10] A new TSC was recruited and financed under Project 2[11] for the ongoing investment program as well as the subsequent investment program (the Rural Connectivity Investment Program).[12] Recruitment followed the quality- and cost-based selection procedure and started in March 2010. After ADB evaluated and approved the bid, the contract with the new TSC was signed on 4 May 2011. The PICs, who were recruited in both project states, were fully financed by the government, and recruitment followed national competitive bidding (NCB). New PICs were engaged for West Bengal in January 2011 and for Assam in July 2011.

21. All civil works procurement under the project followed NCB procedures and conformed to ADB's *Procurement Guidelines*. At appraisal, contracts for works projected to exceed $10 million were meant to be procured using international competitive bidding. In practice, all civil works contracts were procured using NCB, since the contract sizes were all below this threshold. Under the advance contracting and retroactive financing provisions of the FFA, the SRRDAs commenced procurement activities in August 2007. The first contract was awarded in December 2007 in West Bengal, and in May 2008 in Assam. Upon loan effectiveness, all 87 prepared civil works contracts in West Bengal had been awarded, and 68 of 82 contracts in Assam had been awarded. However, the number of non-receipt of tenders was notably high.[13] This was mainly due to security issues, remote subproject locations, and a lack of qualified contractors in the project area. It was necessary to initiate rebidding for these nonresponsive contracts. To attract smaller contractors, some contracts were split into smaller packages.

22. During implementation, some contracts that were tendered but not responded to, or those that failed to secure environmental clearance promptly were removed from the project scope (para. 39). A total of 184 civil works contract packages (85 in Assam and 99 in West

[10] ADB. 2006. *Rural Roads Sector II Investment Program—Project I*. Manila (Loan 2248-IND).
[11] ADB. 2008. *Rural Roads Sector II Investment Program — Project II*. Manila (Loan 2414-IND).
[12] ADB. 2012. *Report and Recommendation of the President to the Board of Directors for the Proposed Multitranche Financing Facility, Technical Assistance, and Administration of Technical Assistance to India for the Rural Connectivity Investment Program*. Manila ($800 million, approved on 12 July).
[13] In West Bengal, seven contract packages were tendered but could not be awarded due to non-receipt of tenders up to the seventh call; these were excluded from the project.

Bengal) were eventually successfully procured and implemented. Civil works procurement also followed the standard PMGSY bidding documents and procedures, with some adjustments to meet ADB financing requirements in the areas of eligibility, anticorruption, and social and environmental safeguards. The use of an ADB-approved electronic tendering system was mandatory for the procurement of all contracts under the project. An ADB-engaged procurement consultant subsequently reviewed the procurement process followed, and documentation used. The review confirmed that there had been no deviation from the procurement arrangements agreed upon earlier. The procurement review also revealed that several contractors had been awarded more than one contract, and most were bidding for multiple contracts within a district.

23. Appendix 9 summarizes the project contract packages with actual costs.

I. Performance of Consultants, Contractors, and Suppliers

24. The TSC was financed by the other loans under the MFF and also worked for Project 3. The performance of the TSC with respect to the scope of services assigned was *highly satisfactory*. As anticipated at appraisal, the NRRDA engaged the TSC to support the project states in implementing the project. The TSC deployed a team of experts comprising social development experts, environment specialists, and road safety experts. The TSC checked the subprojects' compliance with reference to the CPF, EAF, and ECOP provisions. The TSC provided the PIU's with technical support to implement the road safety awareness program and conducted road safety workshops. The TSC also trained the PIUs and the contractors in complying with social and environmental safeguard requirements. The overall performance of the PICs was rated *satisfactory*. At the design stage, the PICs carried out social and environmental screening activities, identified impacts and mitigation measures, performed community consultations, and prepared CPF documents and environmental checklists in accordance with the approved CPF and ECOP for the project. During implementation, the PICs monitored the social and environmental safeguards for all subprojects under the MFF.

25. The overall performance of the contractors was *satisfactory* with respect to the deployment of personnel, supervision, checking the quality of work, and subproject field inspections. Contractor personnel understood the project's requirements and were self-motivated, dedicated, and results-oriented. However, some civil works contracts were terminated due to poor contractor performance and security issues in the project area. The contractors' capacity was enhanced through frequent contract management workshops. The ADB review missions noticed that, in general, contractors were overstretched in the project areas while the length of the PMGSY roads under construction steadily increased. Most of the contracting companies were small, and required help accessing construction machinery and equipment. As the contracts of some non-performing contractors were terminated, it was necessary to conduct procurement for the remaining works, which delayed project implementation.

J. Performance of the Borrower and the Executing Agency

26. The performance of the borrower and of the executing agencies was rated *highly satisfactory*. This is reasonably consistent with the expected performance at appraisal, as more experience has been gained from the previous and other ongoing tranches. The borrower was the central government, and the executing agencies for the project were the MORD at the central level and the state governments at the state level. During implementation, sound organizational arrangements were established to ensure the efficient and timely management of project implementation. The central government provided the required counterpart funds

($56.59 million equivalent) and all necessary support in a timely manner. To ensure successful project implementation, the executing agencies closely monitored construction progress and regularly coordinated quality control activities. The executing agencies, with assistance from the consultants, prepared the required periodic project progress reports and project completion report. Chartered accountants audited the financial accounts and statements, which indicated that the ADB loan was used properly. The investment program and other capacity building programs significantly enhanced the capability of the executing agencies, implementing agencies, and PIUs. The executing and implementing agencies also facilitated the ADB review missions for the entire MFF, and for the project in particular.

K. Performance of the Asian Development Bank

27. ADB's overall performance is rated *satisfactory*. The investment program, including the project, was administered and supervised from ADB headquarters. During implementation, ADB was closely involved in identifying potential problems, and conducted regular reviews to resolve issues related to the project's implementation, including the inception mission in 2008, five review missions during 2009–2011, and the completion mission in 2015 (see Basic Data). During these missions, ADB visited the sites of a number of selected subprojects, checked the project's physical progress, reviewed compliance with social and environmental safeguards, and provided advice on various aspects of project implementation. ADB also conducted regular procurement and disbursement audits, and provided substantial assistance relating to consultant recruitment, implementation progress, and loan disbursement. Overall, ADB assistance was provided sufficiently and in a timely manner. The executing and implementing agencies also recognized the role of the ADB missions in advising on matters related to technical issues and contract administration.

III. EVALUATION OF PERFORMANCE

A. Relevance

28. The project at both appraisal and completion was considered *relevant* to the objective of improving connectivity in rural areas by developing rural access roads, which is the government's strategy for achieving economic growth and reducing poverty. As in Projects 1 and 2, the all-weather rural roads developed or upgraded through this project were chosen for the investment program based on specific criteria and designed in accordance with the PMGSY guidelines. Technical and safeguard requirements were incorporated in the design project report prepared for each project road, and due diligence activities were carried out to ensure that these requirements were fulfilled. As part of the PMGSY, the project was *relevant* to the government's Tenth Five Year Plan, 2002–2007 and the plans that succeeded it.[14] ADB's country partnership strategy, 2009–2012 for India was designed to support the government's efforts in (i) addressing some of the constraints identified in the Eleventh Five-Year Plan, and (ii) facilitating inclusive growth. The MFF modality in the rural roads sector development has facilitated continuous improvements in the way that each tranche was prepared. The project identified challenges and opportunities faced in implementing previous projects under the investment program, and incorporated lessons learned in the project design. Despite some changes during implementation, the project outputs and outcomes were important, timely, and effective for the implementation of the PMGSY.

[14] Government of India, Planning Commission. 2002. *Tenth Five Year Plan 2002–2007*. Delhi.
Government of India, Planning Commission. 2008. *Eleventh Five Year Plan 2007–2012*. Delhi.

B. Effectiveness in Achieving Outcome

29. The project is rated *effective* in achieving its intended outcomes. At completion, 1,707.59 km of all-weather rural roads were constructed or upgraded in Assam and West Bengal, exceeding the target of 1,670 km. These roads connect 667 rural habitations with a population of more than 1,000 each. This is slightly less than the anticipated 681 habitations in the same category due to the reduction of the number of subprojects. Overall, these roads have benefited about 1.28 million people. At appraisal, most of the project roads were not paved and some sections were cut off during the rainy season. In addition to improving state and other rural roads in the area, the project significantly improved connectivity between rural habitations and workplaces, markets, social and health services, and education facilities.

30. The project has significantly improved accessibility to markets, health, and education facilities in the project areas. The socioeconomic impact study and the ADB missions revealed that, while the average distance traveled by local inhabitants to reach their workplaces increased by about 4 km, their average travel time decreased by 45 minutes. Travel time to health care facilities has decreased by about 30 minutes (on average, for the entire year), and by as much as 2 hours during the rainy season in some habitations. Apart from a variety of media, rural populations now have better access to all government schemes through information provided at government offices at the block and district levels. Access to transport services, such as goods vehicles and rural passenger services, has also increased due to better road conditions. Daily public transport services increased by an average of 115% for buses and 200% for jeeps, vans, and three-wheeled vehicles. Vehicle travel speed increased from 25 km per hour to 40–50 km per hour on the improved roads, which has significantly reduced travel time and vehicle operating costs (VOC). It was expected that a substantial proportion of the VOC savings would go to road users after the rural road improvement, and that the road safety measures designed under the project would substantially improve road transport safety. Along with other rural socioeconomic development schemes, the improved roads have and will continue to significantly benefit local residents, especially the poor. The project has met its community participation targets. Consultations with all affected communities were conducted in keeping with the CPF, grievance mechanisms were put in place, and project data information boards were installed at the start of each road to be built. No complaints were received from the affected communities.

31. During implementation, due diligence on the implementation of the environmental safeguards for the investment program found that the initial environmental examination (IEE) had adequately assessed the potential environmental issues, and that contractors had implemented mitigation measures during the construction stage. The state governments and PIUs, with assistance from the TSC, carefully implemented the environmental mitigation measures, and the PICs monitored the environment regularly. The ADB missions noted that the implementation of environmental safeguards in both project states was generally in order, and no significant environmental impacts were reported (see paras. 38 and 39 for details).

C. Efficiency in Achieving Outcome and Outputs

32. Despite the longer implementation period, project implementation is rated *efficient* in light of robust traffic growth and the results of the economic reevaluation. Following the ADB

PCR mission, a due diligence traffic survey was conducted in February–March 2016.[15] Actual traffic data on the sample project roads was collected and processed. Analysis of the traffic survey results (i.e., comparison with that at appraisal), showed that the number of road users on the project roads had significantly increased. Based on the survey results, the traffic forecast at appraisal was adjusted by considering the faster socioeconomic development, the improved road networks, and the rapid increase in motorized vehicle registrations in the project area. Traffic on the project roads was estimated to increase by an average of 6.9%–10.3% annually during 2016–2020 and by 4.8%–8.0% from 2021 onwards. The revised traffic rates are higher than those anticipated at appraisal, reflecting a faster increase in traffic demand in the project area.

33. To measure the project's efficiency, an economic reevaluation was performed by recalculating the economic internal rate of return (EIRR) using a similar methodology to that at appraisal and taking into account the data collected after project implementation. The analysis also considered project implementation delays. The economic reevaluation compared the economic costs and benefits of the with- and without-project scenarios, including VOC savings and passenger-time cost savings. The recalculated EIRR was 17.0% for the whole project, 12.5% for Assam, and 23.1% for West Bengal. The EIRR for Assam is lower than the 15.6% estimate at appraisal, mainly due to higher investment costs and a prolonged implementation period. The EIRR for West Bengal is higher than the 20.1% appraisal estimate, mainly due to much higher traffic volumes on the project roads. As the recalculated EIRRs are above the ADB-recommended social discount rate of 12%, the project can be considered economically viable. The EIRRs were subjected to a sensitivity analysis, the results of which showed that the project remains economically viable in all tested scenarios. In the case of a combined 20% maintenance cost increase and 20% benefit reduction, the EIRR for the whole project would be 13.8%. The sensitivity test also showed that the EIRR is more sensitive to changes in benefits. Therefore, the government should focus more on socioeconomic development in the project area, and implement policies to stimulate transport services and increase villagers' incomes. Appendix 10 summarizes the economic reevaluation.

D. Preliminary Assessment of Sustainability

34. The project is rated *likely to be sustainable*. Under the PMGSY guidelines, the civil works contracts contained a provision requiring contractors to maintain the roads for 5 years post-construction. According to the latest arrangement, after this liability period the SRRDAs are responsible for road maintenance. *Zilla panchayats* participate in maintenance planning and comment on the prioritization of maintenance activities and projects. In two circulars dated 9 September 2010 and 12 November 2010, the MORD introduced a mechanism to ensure that state governments provide timely and adequate funding for the maintenance of the PMGSY roads during the 5-year post-construction period. Each state government is required to compute annual requirements for maintenance funds for all in-force PMGSY contracts, issue a certificate-cum-undertaking regarding the proper maintenance of all PMGSY roads, and act upon it. Further, each state government is required to deposit the associated maintenance funds into the SRRDAs' maintenance accounts in two installments each year. Starting on 31 October 2010, the release of PMGSY funds (for construction) is made contingent upon compliance with the circulars' stipulations. Funding of the PMGSY roads after the 5-year post-construction period is

[15] To obtain the latest traffic data, a due diligence traffic survey was designed and implemented in February–March 2016. A consultant team was recruited to carry out 12-hour traffic count surveys on selected project roads (16 roads in each state).

covered by the government's resources on a grants-in-aid basis. Maintenance funds are currently provided in accordance with the recommendations of the 13th Financial Commission in its report covering 2010–2015 submitted to the President on 30 December 2009. The Financial Commission assessed the ordinary repair requirements of roads in a state, and recommended a grant equivalent to 90% of the estimated funding requirement for PMGSY roads. Since the PMGSY is a priority government scheme, the grants-in-aid for the maintenance of PMGSY roads beyond the 5-year post-construction period is likely to remain a priority item. The ADB PCR mission noted that the roads created under the project were generally well maintained, and funds and capacity for road maintenance were sufficient. To enhance monitoring, the NRRDA intended to publish the road maintenance status on the PMGSY website, including costs.

35. Some sustainability-related issues observed during the ADB PCR mission have been brought to the attention of the governments:

(i) In flood-prone or shaded areas where rainwater takes longer to evaporate, bituminous road surfaces are more likely to be easily damaged. A preventive measure, such as using higher road surface specifications, was recommended, with more regular inspection of such sites by the relevant PIUs.
(ii) In addition to maintaining the quality of the road surface, maintenance activities should include road shoulders, signage, and other road furniture.

36. The continuous implementation of the PMGSY, with external assistance from development partners, has contributed to the sustainability of rural road development and poverty reduction in India. The project is the third loan under the investment program; in light of the previous projects' successful implementation, ADB approved a new investment program to continue to support the PMGSY's implementation (footnote 12). The NRRDA was conceived as a compact, professional, and multidisciplinary body to provide the requisite technical and management support to the MORD and state governments to implement the PMGSY effectively. Under the program, state governments are responsible for planning, implementing, and maintaining rural roads. To better manage the PMGSY projects, the executing agencies, implementing agencies, and regional PIUs have adopted and used several computer-based systems, including systems for road planning and maintenance, e-tendering and procurement, and centralized online monitoring, management, and accounting.

E. Impact

37. **Poverty and other social indicators**. The project impact is rated *significant*. The overall investment program, including the project, has contributed to poverty reduction in the country by using a large amount of local labor during implementation. The project used approximately 1,167 million person-days, and most of these laborers were from poor families in the project area. During operation, the public transport service and related businesses have been significantly promoted, and generate a large number of working opportunities for the poor. Using education as a proxy attribute that reflects poverty rate, the investment program has helped reduce the number of uneducated inhabitants by approximately 8%. Access to health care for rural communities improved substantially, especially during the rainy season in some habitations. The frequency of clinic or hospital visits has increased by 5% for those visiting at least once a month. Accessing large and more distant markets to sell agricultural products has increased farmers' incomes, and contributed significantly to poverty reduction in the project areas.

38. **Environmental safeguards**. The entire investment program, including the project, was

categorized as B in accordance with ADB's *Environmental Assessment Guidelines* (2003). The investment program was not subject to the Indian Environmental Impact Assessment Notification of the Ministry of Environment and Forests, and the government does not require an environmental assessment for this investment program and its subprojects. However, an IEE of sample subprojects was prepared as part of the detailed project reports. The anticipated environmental impacts were the removal of trees due to road widening, generation of dust and emissions from construction equipment and machinery, sedimentation and erosion from the earthworks, mismanagement of borrow areas, localized flooding due to the siltation of drainage canals, and occupational health and safety of construction workers as well as of local communities in the project area. Due diligence on the implementation of the environmental safeguards for the investment program found that the IEE report adequately assessed the potential environmental issues, and that the contractors had implemented mitigation measures during the construction stage.

39. At project preparation, the establishment of a monitoring system was requested as part of the PIC's work assignments to improve the contractors' performance. The state governments and PIUs, with assistance from the TSC, carefully implemented the environmental mitigation measures, and the PICs carried out regular environmental monitoring. The ADB missions noted that the implementation of environmental safeguards in all project states was generally in order: (i) the project states had incorporated the standard environmental management plan in their bidding document for civil works; (ii) the contractors' bill of quantities included costs for environmental mitigation measures; (iii) certain drainage measures were incorporated in the project design and constructed to ensure that the drainage was efficient and that no waterlogging occurred; and (iv) the PICs were asked to act immediately on any identified gaps. In Assam, some subprojects that would pass through a bird sanctuary and disturb ecological balances were removed from the project. The PCR mission's traffic survey identified an increased traffic flow in the project roads. However, since the setting is rural and traffic levels are still fairly low, the risk of standards being exceeded is low.

40. **Land acquisition and social safeguards**. During the formulation of the investment program, a social assessment and survey of sample households was conducted; this concluded that the width of the existing roads would be sufficient to accommodate a right-of-way of about 7.5 m. Thus, minimal land acquisition was required, and only for road shoulder adjustment. No relocation was needed, as only minor realignments were required. Drawing on experience from the previous projects and coordinating with World Bank-financed rural roads projects in other states, the government and ADB agreed upon the CPF to provide guidance and mitigation measures relating to voluntary land donation, and to ensure community participation during implementation. During implementation, community participation has improved due to the carrying out of consultations with all affected communities in keeping with the CPF, and a grievance mechanism was put in place. Information boards containing the project data were installed at the start of each project road to be constructed. When it was necessary to secure private land for specific subprojects, the voluntary land donation system was used. In very few cases, revenue land was provided to vulnerable affected persons as replacement land through an extensive legal procedure with support from the PIUs. During the ADB mission from December 2011 to January 2012, the field visit and randomly selected CPF documentation review revealed that (i) people voluntarily agreed to contribute their land for the road construction (this was confirmed through verbal and written records, and verified by the *zilla panchayats*); (ii) landowners and non-titled people were fully consulted regarding site selection; (iii) redress mechanisms were put in place at the village level; and (iv) proper attempts had been made to implement the CPFs more fully. During implementation, the PIUs ensured that the road selection criteria, community participation process, and their documentation complied with the

CPF principles and procedures. Adverse social impacts were mitigated through design modifications and the selection of alternative alignments. No complaints were received from the affected communities. The project was categorized as C for indigenous peoples as its impact was insignificant.

41. **Socioeconomic impact**. The PMGSY has very effectively supported socioeconomic transformation in rural India. A multiyear study was undertaken to gauge the socioeconomic impacts of the project and investment program. Six surveys in 2008 and 2009 monitored a sample of 9% of the habitations connected by the subprojects in the states of Assam, Orissa, and West Bengal. In the second quarter of 2011, ADB fielded missions to the project states to validate the data collected during the study, and to gather anecdotal information to deepen the analysis. The ADB PCR mission in October 2015 met with local communities along selected roads and verified that they are satisfied with the benefits brought on by the construction and upgrading of the roads. After the mission, a due diligence survey was conducted in February–March 2016 covering four districts in each of the two states, which included a quick traffic survey and social impact analysis.

42. The socioeconomic impact survey and study revealed the following impacts:

(i) Journey time to the nearest local market center decreased by 70%–75% and the average distance traveled by local inhabitants to their workplaces increased by about 4 km.
(ii) Daily public transport services increased by an average of 115% for buses, and 200% for jeeps, vans, and three-wheeled vehicles.
(iii) Rural populations now have better access to all government schemes and information at government offices at the block and district levels (as well as being informed through a variety of media).
(iv) The average frequency of clinic or hospital visits has tripled for those visiting at least once a month (130 respondents).
(v) Better access to markets and other government programs has led to an average increase of about 80% (Rs3,500–Rs6,300) in monthly income levels in the sample habitations.
(vi) The number of farmers using crop diversification techniques has increased by about 20% and will continue to increase.
(vii) The average number of farmers visiting nearby markets regularly has increased by about 45%.
(viii) The project implementation used a large amount of local labor, totaling 389,344 person-months, including 77,869 person-months labor for women. Most of the laborers were local residents.
(ix) The role of women in local governance has increased, with approximately 50% of habitations having a woman as the elected village-head. Most notably, access to health and education facilities for women has improved overall.
(x) New microenterprises at the habitation level increased by about 30% (from 14 to 18), mainly in the form of small general stores.
(xi) The number of young people pursuing secondary education outside of their habitations has increased from three to six. The proportion of inhabitants who had completed grade 12 and higher increased from 21.1% to 22.2%, the proportion completing grades 10–12 increased from 41.3% to 42.6%, and the proportion completing grades 5–10 increased from 33.34% to 34.9%. The percentage of uneducated inhabitants decreased from 45.5% to 39.2%, and that of un-enrolled children dropped from 45.9% to 32.4%.

(xii) Land prices in the sample habitations with improved connectivity increased by about four to five times on average, due in part to the improved roads.

43. The survey and assessment concluded that improved connectivity has substantially impacted rural living conditions by giving communities more reliable and quicker access to outside products, services, information, and social links, and by allowing external service and product providers and social contacts improved access to rural communities. The roads have acted as a catalyst for sustained improvements in living conditions and will facilitate continual development in rural India. A summary of the socioeconomic impacts is in Appendix 11.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

44. Overall, the project is rated *successful*. The project was *relevant* to the government's overall development objectives and ADB's country partnership strategy. The project design was also relevant to the government's strategy and local socioeconomic development requirements. The completed rural roads have effectively improved connectivity in the project areas and significantly supported rural socioeconomic development. Implementation of the project met the main objective of supporting the PMGSY's implementation. The economic reevaluation confirmed the project's robust economic viability. The project impact study concluded that significant socioeconomic benefits have accrued to the direct beneficiaries, especially the poor. The project is also considered *likely to be sustainable*, in light of the presence of the road maintenance program as well as the overall development and arrangement of the PMGSY. The objectives of the project's impacts, outputs, and outcomes anticipated at appraisal have been achieved.

B. Lessons

45. The project was the third package under the investment program. It has helped the central and state governments gain more experience and identify capacity gaps and areas for improvement through various project implementation activities. Some of the lessons learned are listed below, and could be considered for ongoing and future projects in the sector.

46. **Implementation delays**. The project experienced substantial implementation delays, which led to extra project costs and postponed the project's anticipated socioeconomic benefits. The government should analyze the reasons for these and develop practical measures to prevent recurrence of the same issues, including careful scheduling of project implementation, better contract management, and on-site monitoring of contractor performance. Subprojects with land donation issues might require longer time to resolve; this could be identified during the subproject selection for inclusion in the subsequent tranches under the investment program, for example.

47. **Fostering the local contractor industry**. All civil works contractors for the project were local, and some were small companies with limited access to equipment, financial resources, and skilled and qualified staff. Due to the increasing length of PMGSY roads to be constructed, the overall industry was overstretched in the project areas. This was a major reason for project implementation delays and became an outstanding issue in the country. While fostering the local contractor industry by providing more capacity building programs and necessary technical and financial support, the government should engage with local contractors to understand their

current capacity for contract management and project delivery during the contract packaging process.

C. Recommendations

1. Project Related

48. **Project benefit monitoring and evaluation**. The investment program has demonstrated the remarkable socioeconomic impacts of rural road development. It is recommended that ADB, in association with the government, design and carry out a long-term socioeconomic monitoring program by conducting regular surveys and analyses to understand the changes in every year brought about by the investment program. A set of measurable socioeconomic indicators should be used to analyze the impacts, and the results used to improve the design of future ADB projects and enhance the socioeconomic benefits of rural road projects.

49. **Timing of the project performance evaluation report.** The project performance evaluation report could be prepared in 2017 or later, at which point all of the project roads will have fully operated for more than 3 years. By then, traffic development, road maintenance, project property physical condition, public transport services, benefits attained, and impacts on poverty can be better assessed.

2. General

50. **Capacity improvement for rural road development**. In Assam and West Bengal, institutional capacity for rural road development is inadequate, especially with regard to institutional arrangements and the adoption of modern concepts and techniques. A capacity building and human resource development program could be designed and incorporated in future project design. ADB should emphasize training for PIU staff and local consultants through the rural connectivity research and training centers being established under the Rural Connectivity Investment Program. Advanced road asset management concepts and tools could be adopted to maintain the operational performance of the growing rural road network effectively and efficiently.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Results
Impact of Investment Program Contribute to reduction in poverty and deprivation, and support economic growth of the community connected by investment program roads	Three to four years after completion of subprojects under the investment program (2011 for first loan subprojects): Reduction in poverty rates in rural areas served by investment program roads by 5% Improvement in social indicators in rural areas served by investment program roads by 10%, including for maternal and infant deaths, safe delivery, immunization, post primary dropout, and and primary school teacher attendance.	 Project implementation used a large amount of local labor—389,344 person-months, including 77,869 person-months labor by women. Most of these laborers were from poor families in the project area. The number of young people pursuing secondary education outside of their habitation has increased from 3 to 6. The proportion of inhabitants who had completed grade 12 and above increased from 21.1% to 22.2%. The number of uneducated inhabitants decreased from 45.5% to 39.2%. Travel time to health care facilities has decreased on average by about 30 minutes (for the entire year) and by as much as 2 hours during the rainy season in some habitations. Those who visit clinics or hospital at least once a month now do so three times as frequently, on average (130 respondents).
Outcome of Investment Program Improved connectivity of rural community to markets, district headquarters, and other centers of economic activity via investment program roads	By the end of the investment program (2010): Investment program states to have rural road networks connecting all habitations with populations of 1,000 and above with all-weather roads (as of April 2005, habitations in this population class without all-weather connectivity number 4,692 in Assam, 2,151 in Orissa, and 9,533 in West Bengal). Improved access to markets and health and education facilities measured in terms of the number of days when access to these facilities is disrupted (currently up to 1/4 of the year, down to less than 15 days per year). Diversified income opportunities in rural areas	 Under the project, 1,123 habitations have been connected by all-weather roads—526 in Assam and 597 in West Bengal. Including Projects 1–4, the investment program has developed a total of 8,185 km of all-weather rural roads and benefited 4,080 rural habitations. Access to markets, health, and education facilities is affected on zero days per year. The roads also promote greater social interaction

Design Summary	Performance Targets/Indicators	Results
	measured in terms of the number of people obtaining work outside the village and the change in cropping patterns and agricultural produce marketing (increase in perishable crops have increased in both cropping and marketing).	between villagers and external residents, most evidently through an increase in the number of marriages that have taken place in communities since connectivity, and (on average) a three to four times increase in the number of trips made for social interaction.
Outputs of Project 3 1. Construction and upgrading of rural roads to all-weather standard	By June 2010: 1,670 km priority rural roads in Assam and West Bengal constructed and upgraded to all-weather standard connecting 1,279 rural habitations.	By loan closing in June 2013: A total of 1,707.59 km of all-weather rural roads were constructed and/or upgraded in Assam and West Bengal, which connected and benefited 1,123 rural habitations in the project states. Including Projects 1–4, the investment program has developed a total of 8,185 km of all-weather rural roads and benefited 4,080 rural habitations.
	Rural roads improved under earlier completed loans of the investment program to maintain a pavement condition index (defined in PMGSY Operations Manual) value of 5.	The constructed and/or upgraded roads were of good quality, and the road surface roughness was within the international roughness index for a comfortable ride (about index 4–6).
2. Improved community participation	Improvements to PMGSY community consultation procedures measured by satisfaction of the affected communities	Consultations with all affected communities were conducted according to the CPF. Grievance mechanisms were formed and in place during project implementation. Information boards containing related project data were installed at the start of each road to be built. No complaints were received from affected communities.

Activities with Milestones	Inputs of Project 3 at Project Preparation	Main Milestones and Inputs at Actual
0.0 Framework Financing Agreement (FFA) 0.1 Signed on 25 November 2005 1.0 Subproject preparation and implementation 1.1 Subproject preparation by Assam and West Bengal started in late 2006 1.2 Advance contracting (since August 2007 in West Bengal and since February 2008 in Assam 1.3 Contract award (since December 2007 in West Bengal and since May 2008 in Assam 1.4 Subproject completion by June 2010 2.0 Periodic Financing Request 2.1 PFR draft reviewed by ADB review missions in May and June 2008 2.2 PFR 3 submission on 3 July 2008 for $130 million 3.0 ADB Review 3.1 Review of ongoing subprojects— at least biannually 3.2 ADB review of states' readiness to implement additional loans— to be done concurrently with above review of ongoing subprojects	ADB OCR financing of $130 million (under the same MFF, ADB OCR financing of $180 million for Project 1 and $77.65 million for Project 2 has already been committed) Government counterpart financing of $38.8 million ADB staff time for MFF administration, including review of draft PFRs and preparation of loan and/or project agreements for individual loans	ADB appraised the MFF on 1–5 August 2005. The FFA was signed on 25 November 2005. ADB received the third PFR under the investment program on 24 June 2008. The loan for the project was approved on 26 September 2008, signed on 10 November 2008, and became effective on 5 January 2009. At completion, $178.32 million had been provided for project implementation, consisting of $121.73 million from the ADB loan and $56.59 million equivalent from the government's own resources. The TSC and PICs engaged to assist in project implementation were financed by other loans under the MFF or the government's own resources. Actual cost for the project ($ million): Road connectivity $176.02 Financial charges $2.30 **Total** **$178.32**

ADB = Asian Development Bank, CPF = community participation framework, FFA = framework financing agreement, km = kilometer, MFF = multitranche financing facility, OCR = ordinary capital resources, PFR = periodic financing request, PIC = project implementation consultant, TSC = technical support consultant.
Source: ADB project completion review mission.

SUMMARY OF PROJECT OUTPUTS

	Unit	Assam	West Bengal	Total
Sanctioned				
Roads	no.	142	116	**258**
Length	km	984.3	908.1	**1,892.4**
Procured				
Packages	no.	85	99	**184**
Roads	no.	139	109	**248**
Length	km	959.7	843.4	**1,803.1**
Completed Total				
Packages	no.	85	99	**184**
Roads	no.	106	100	**206**
Length	km	**900.00**	**807.59**	**1,707.59**
Including:				
New Connections Total				
Roads	no.	106	99	**205**
Length	km	900.00	804.09	**1,704.09**
Upgraded Total				
Roads	no.		1	**1**
Length	km		3.5	**3.5**
Habitations Connected				
>1000		342	325	**667**
>500		95	187	**282**
>250		89	85	**174**
<250		0	0	**0**
Total		**458**	**597**	**1,123**

km = kilometer, no. = number, PMGSY = *Pradhan Mantri Gram Sadhak Yojana* (Prime Minister's Rural Roads Program).

Note: A habitation, a unit used in the PMGSY, is a distinct cluster of population with houses occupying an area, and having a local name.

Source: ADB project completion review mission.

PROJECT COST AND FINANCING

Table A3.1: Project Costs
($ million)

	At Appraisal	Actual
Road Connectivity Component	163.30	176.02
Financial Charges	5.50	2.30
Total	**168.80**	**178.32**

Source: Asian Development Bank; project implementation units.

Table A3.2: Project Financing
($ million)

	At appraisal		Actual	
Source	**Total Cost**	**% of Cost**	**Total Cost**	**% of Cost**
ADB	130.00	77.0%	121.73	68.3%
Government	38.80	23.0%	56.59	31.7%
Total	**168.80**	100.0%	**178.32**	100.0%

ADB = Asian Development Bank.
Sources: ADB; project implementation units.

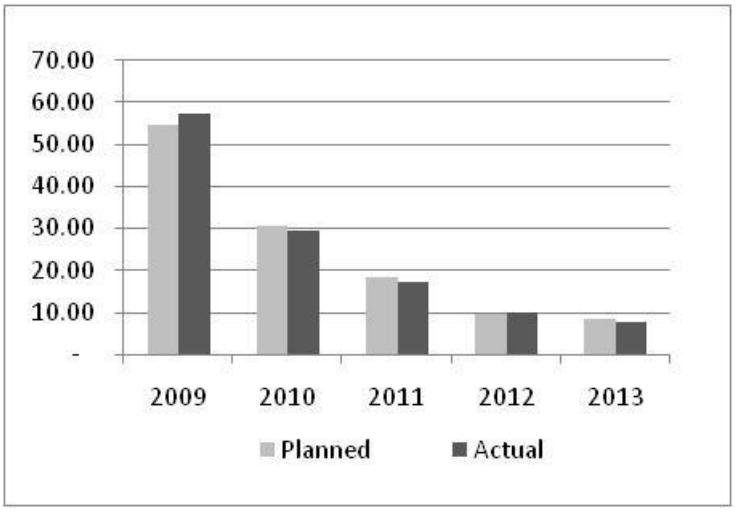
DISBURSEMENT OF ADB LOAN PROCEEDS

Table A4: Annual and Cumulative Disbursement of ADB Loan Proceeds
($ million)

Year	Annual Disbursement			Cumulative Disbursement	
	Amount ($ million)		% of Total	Amount ($ million)	% of Total
	Planned	Actual			
2009	54.78	57.30	47.1%	57.30	47.1%
2010	30.43	29.38	24.1%	86.68	71.2%
2011	18.26	17.27	14.2%	103.95	85.4%
2012	9.74	10.07	8.3%	114.01	93.7%
2013	8.52	7.72	6.3%	121.73	100.0%
Total		**121.73**	**100.0%**		

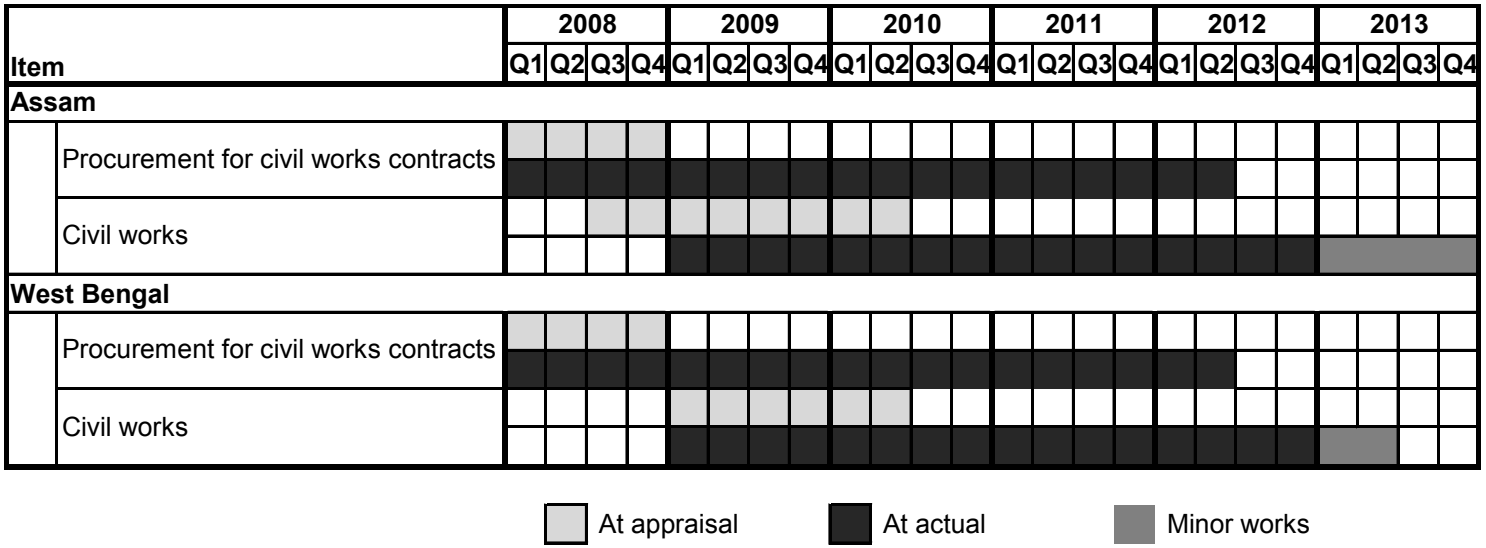
ADB = Asian Development Bank.
Source: ADB.

Figure A4: Planned and Actual Loan Disbursement



Source: Asian Development Bank.

ACTUAL PROJECT IMPLEMENTATION SCHEDULES



Q = quarter.

Sources: Project implementing agency; Asian Development Bank project completion review mission.

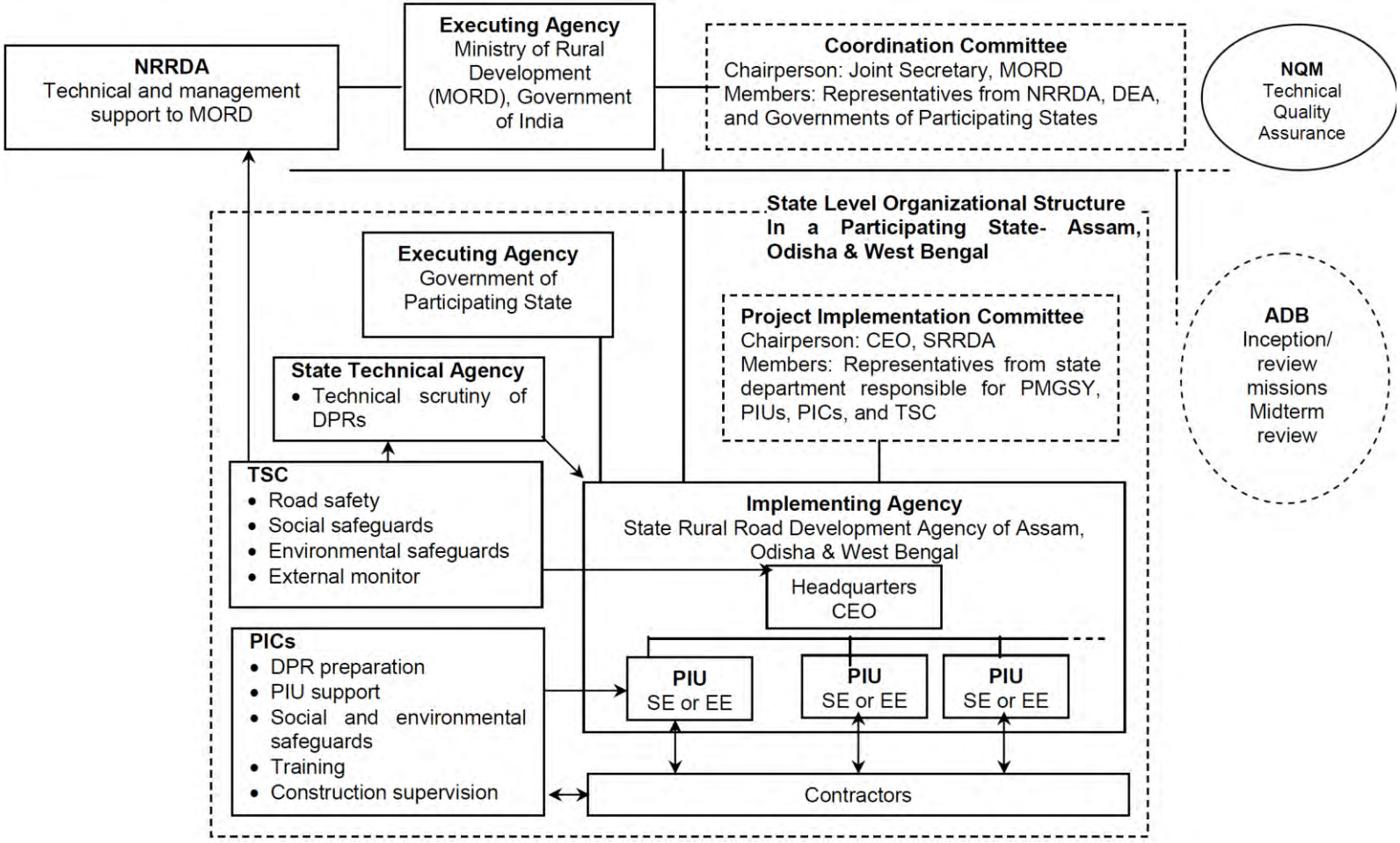
CHRONOLOGY OF MAJOR EVENTS

Date	Main Event
A. Processing of the Multitranche Financing Facility	
2003	
20 November	Approval of the Rural Roads Sector II Investment Program (PPTA 4220-IND)
2004	
November	Start of feasibility study
2005	
18–28 March	ADB consultation mission
10 April–17 May	ADB fact-finding mission
18–28 April	ADB consultation mission
11 July	ADB first management review meeting
1–5 August	ADB appraisal mission
31 August	The borrower officially communicated its view that the loan size should be expanded, subject to the availability of the MFF to the borrower
August	Completion of feasibility study
12–16 September	ADB specific consultation
14 October	ADB second management review meeting
19 October	ADB approval to proceed with loan negotiations
24 November	Framework financing agreement negotiation held in India
25 November	Signing of framework financing agreement
25 November	First periodic financing request from the government for an indicative amount of $100 million
28 November	ADB Board RRP circulation
20 December	Board consideration and approval of $750 million for the investment program
B. Processing of the Third Loan (Project 3) (Loan 2445)	
2007	
10 November	ADB approval of retroactive financing
2008	
24 June	Third periodic financing request from the government for an indicative amount of $130 million
17 September	Loan negotiation
26 September	ADB approval of the loan
10 November	Signing of the loan agreement
2009	
5 January	Loan effectiveness

Date	Main Event
C. Project Implementation (Project 3)	
2008	
10–18 November, 5–11 December	ADB project inception mission
2009	
23 January	First loan disbursement
4–13 February	ADB project review mission
27 July–26 August	ADB project review mission
14 November– 2 December 2009	ADB project review mission
2010	
30 June 2010	Original completion date for Project 3
31 December	Original loan closing date
2–20 December	ADB project review mission
2011	
27 January–7 February	ADB project review mission
21 December	First partial loan cancellation of $3 million
31 December	Extended loan closing date (first)
2012	
30 June	Extended loan closing date (second)
31 December	Extended loan closing date (third)
2013	
30 June	Actual loan closing date
12 August	Last loan reallocation
12 August	Second partial loan cancellation of $5.27 million
12 November	Final loan disbursement
19 November	Actual financial loan account closing date
2015	
26–30 October	ADB project completion review mission

ADB = Asian Development Bank, MFF = multitranche financing facility, PPTA = project preparatory technical assistance, RRP = report and recommendation of the President.
Source: ADB project completion review mission.

ORGANIZATIONAL STRUCTURE FOR PROJECT IMPLEMENTATION



ADB = Asian Development Bank; CEO = chief executive officer; DEA = Department of Economic Affairs, Ministry of Finance; DPR = detailed project report (road design); EE = executive engineer; MORD = Ministry of Rural Development; NQM = national quality monitor; NRRDA = National Rural Roads Development Agency; PIC = project implementation consultant; PIU = project implementation unit; PMGSY = *Pradhan Mantri Gram Sadhak Yojana* (Prime Minister's Rural Roads Program); SE = superintending engineer; SRRDA = State Rural Roads Development Agency; TSC = technical support consultant.

Source: ADB. 2005. *Report and Recommendation of the President to the Board of Directors for the Proposed Multitranche Financing Facility to India for the Rural Roads Sector II Investment Program*. Manila.

STATUS OF COMPLIANCE WITH MAJOR LOAN COVENANTS

Particulars	Reference in Loan Agreement	Status of Compliance
PARTICULAR COVENANTS		
(a) The Borrower shall cause MORD and the State to carry out the Project with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, social, and rural roads development practices. (b) In the carrying out of the Project and operation of the Project facilities, the Borrower shall perform, or cause to be performed, all obligations set forth in Schedule 5 to this Loan Agreement.	LA, Article IV Section 4.01	**Complied with.** (a) The MORD and project states implemented the project with due diligence, efficiently, and in conformity with sound administration. (b) The MORD and NRRDA caused the project states to carry out the project and operation of the project facilities in compliance with the obligations set forth in the loan agreement.
The Borrower shall make available to MORD, and the States, promptly as needed, the funds, facilities, services, and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project.	LA, Article IV Section 4.02	**Complied with.** The MORD and project states provided sufficient support and funds in a timely fashion to carry out the project. Upon completion, a total of $56.59 million equivalent of government funds had been provided to the project.
The Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	LA, Article IV Section 4.03	**Complied with.** A coordination committee, chaired by the MORD joint secretary and comprising representatives from relevant agencies, was put in place to monitor the use of the loan and overall implementation performance of the project. The project was implemented fully under the PMGSY guidelines.
The Borrower shall take all action which shall be necessary on its part to enable MORD, and the State to perform its obligations under the Project Agreement, and shall not take or permit any action which would interfere with the performance of such obligations.	LA, Article IV Section 4.04	**Complied with.** The MORD and project states performed their obligations under the project agreement.
The Borrower shall exercise its rights under the financing arrangements in such a manner as to protect the interests of the Borrower and ADB and to accomplish the purposes of the Loan.	LA, Article IV Section 4.05	**Complied with.** The project was implemented under the financing arrangement in such a way as to protect the interests of the borrower and ADB and to accomplish the purposes of the loan.
PROCUREMENT OF GOODS AND WORKS, AND CONSULTING SERVICES		
Procurement for Goods and Works Except as ADB may otherwise agree, Works shall be procured only on the basis of the methods of procurement set forth below: National Competitive Bidding. The method of procurement is subject to, among other things, the detailed arrangements and threshold values set forth in the Procurement Plan. The Borrower may only modify the methods of procurement or threshold values with the prior agreement of ADB, and modifications must be set out in updates to the Procurement Plan. National Competitive Bidding. The Borrower, through MORD and the States, and ADB shall ensure that any procurement activity under national competitive bidding must be consistent with the Procurement Guidelines. The PMGSY standard bidding documents and procurement procedures used for national	LA, Schedule 4 Para. 3	**Complied with.** The procurement of civil works contracts conformed to ADB's *Procurement Guidelines*. All works were procured using national competitive bidding. The procurement of civil works also followed the PMGSY standard bidding documents and procedures with the agreed adjustment for ADB-financed items on eligibility, anticorruption, and social and environmental safeguards under the project.

Particulars	Reference in Loan Agreement	Status of Compliance
competitive bidding under Project 1 shall continue to apply to Subprojects financed under the proceeds of the Loan. Any modifications and clarification to such procedures agreed between the Borrower and ADB shall be set out in the Procurement Plan. Any subsequent change to the agreed modifications and clarifications shall become effective only after the concurrence of such change by the Borrower and ADB.		
Conditions for Award of Contract The Borrower through MORD and the State shall ensure that no Works contracts financed under the Loan are awarded until all requirements as referred to in this Schedule and in paragraphs 12, 13, and 23 of Schedule 5 to this Loan Agreement have been complied with.	LA, Schedule 4 Para. 5	**Complied with.** All works contracts were awarded after all related requirements in the loan agreements were complied with.
Industrial or Intellectual Property Rights (a) The Borrower through MORD and the State shall ensure that all Goods and Works procured (including without limitation all computer hardware, software and systems, whether separately procured or incorporated within other goods and services procured) do not violate or infringe any industrial property or intellectual property right or claim of any third party. (b) The Borrower through MORD and the State shall ensure that all contracts for the procurement of Goods and Works contain appropriate representations, warranties and, if appropriate, indemnities from the contractor or supplier with respect to the matters referred to in subparagraph (a) of this paragraph.	LA, Schedule 4 Para. 6	**Complied with.** Goods and works procured under the project did not violate or infringe any industrial property or intellectual property rights. All contracts for the procurement of works had representations, warranties, and indemnities with respect to industrial or intellectual property rights.
EXECUTION OF PROJECT AND OPERATION OF PROJECT FACILITIES; FINANCIAL MATTERS		
Execution and Implementation The Project Executing Agencies for the Project shall be (a) MORD at the central level, (b) Assam through its Public Works Department, (c) Orissa through its Rural Development Department, and (c) West Bengal through its Panchayat and Rural Development Department at the state level. MORD shall be responsible for overall supervision and execution of the Project at central level and each State shall be responsible for the execution of the Project at their state level.	LA, Schedule 5 Para. 1	**Complied with.** The project was fully implemented in accordance with the PMGSY guidelines. As arranged during project preparation, the executing agencies for the project were the MORD at the central level and state governments at the state level (the Assam State Road Board and West Bengal State Rural Development Agency). The MORD was responsible for the overall supervision and execution of the project.
Each State shall assist the related IA in obtaining approvals and clearances for timely Project execution under the PMGSY Guidelines and other applicable laws and regulations of the Borrower and the State.	LA, Schedule 5 Para. 2	**Complied with.** The state governments assisted the project's execution by obtaining approvals and clearances for timely project implementation under the PMGSY guidelines. In Assam, some subprojects that would pass through a bird sanctuary and disturb ecological balances were removed from the project.
Each State shall provide, as necessary, respective counterpart staff, land facilities, and counterpart funding for the Project in accordance with the financing plan, cost of making land available for the Subprojects and assistance, and implementation and monitoring under the CPF and EAF, including related IEE (including unforeseen expenses beyond the	LA, Schedule 5 Para. 3	**Complied with.** Each project state provided respective counterpart staff, land facilities, and counterpart funds for project implementation and monitoring in accordance with the financing plan and in a timely fashion through approved annual budget allocations.

Particulars	Reference in Loan Agreement	Status of Compliance
estimates), utility relocation, general Project management expenses, and road maintenance, in a timely manner through approved annual budget allocations.		
Each State shall ensure that the PICs continue to assist in the implementation of the provisions of the CPF and the EAF (and related IEE) for all Subprojects under this Project.	LA, Schedule 5 Para. 4	**Complied with.** The project states engaged PICs to monitor the implementation of the CPF and EAF.
Coordination Committees (a) The Borrower shall ensure that the Coordination Committee set up under Project 1 for the Investment Program, continues to meet on a semi-annual basis and monitor the use of Loan funds and overall implementation performance of the Project under the Facility. (b) Each State shall likewise ensure that the State-level standing committee established for the PMGSY that has been serving as the State level Project Implementation Committee under Project 1 shall continue to meet on a quarterly basis to monitor the use of Loan funds and overall implementation performance of the Project under the Facility at the State level.	LA, Schedule 5 Para. 5	**Complied with.** (a) The coordination committee at the central level comprising leaders from relevant agencies met semiannually, and continued to monitor the use of the loan and overall implementation performance. (b) At the state level, similar committees were established under the PMGSY guidelines for overseeing and monitoring the timely implementation of the project.
Project Implementation Unit Each State shall ensure that the Program Implementation Units (PIUs) established by each State in accordance with the PMGSY Guidelines shall implement the Subprojects and carry out necessary coordination with the concerned departments in the State and panchayats to ensure the smooth implementation of the Subprojects.	LA, Schedule 5 Para. 6	**Complied with.** The SRRDAs were the project implementation agencies in the project states. In each district, one or two PIUs were established in accordance with the PMGSY guidelines, led by a superintending engineer (in Assam) or an executive engineer (in West Bengal), and staffed with assistant or junior engineers, cashiers, and other supporting staff.
Each State shall ensure that the services of the PICs shall be utilized in the carrying out of the Project, particularly with regard to assisting the PIUs in: (a) preparing additional subprojects; (b) implementing the CPF to mitigate social impacts; (c) monitoring and implementing the EAF and the relevant provisions of the ECOP and the related IEE; and (d) supporting in social and environmental safeguards.	LA, Schedule 5 Para. 7	**Complied with.** Each project state engaged a PIC to prepare additional subprojects; implement the provisions of the CPF, EAF, and ECOP, monitor and implement the EAF; and support social and environmental safeguards.
Road Maintenance In accordance with the PMGSY Guidelines, each State shall provide adequate and timely funding for proper maintenance of the PMGSY roads. Any increases in the actual amounts to be provided shall be met by the respective State through its respective additional budget allocations, or other alternative sources of financing.	LA, Schedule 5 Para. 8	**Complied with.** In two circulars dated 9 September 2010 and 12 November 2010, the MORD introduced a built-in mechanism to ensure that states provide timely and adequate funding for the maintenance of PMGSY roads within the 5-year post-construction period. Funding of the PMGSY roads after the 5-year post-construction period is covered by the government's non-plan resources on a grants-in-aid basis.
Except as ADB may otherwise agree, each State shall require the respective IA (through the PIU) to ensure proper maintenance of the PMGSY roads until these roads are transferred to the designated zilla panchayats in accordance with the PMGSY Guidelines. Each State shall ensure availability of the requisite funds to the relevant functionaries at either the zilla panchayat or the PIU, as the case may be,	LA, Schedule 5 Para. 9	**Complied with.** According to the latest arrangement, the SRRDAs are responsible for road maintenance after the first 5-year liability period of the civil works contracts. *Zilla panchayats* (village or small-town governments) participate in maintenance planning, and comment on the prioritization of

Particulars	Reference in Loan Agreement	Status of Compliance
for such maintenance in accordance with the requirements of the PMGSY Guidelines.		maintenance activities and projects.
Road Safety As part of the midterm review of the Investment Program as also the Project, the Borrower, the State, and ADB shall review the outcomes of the road safety program, to consolidate the institutional mechanism, financing modalities, and detailed implementing arrangements to further ensure sustainable road safety programs for the roads to be developed under PMGSY and the Investment Program at the national and State levels.	LA, Schedule 5 Para. 10	**Complied with.** The midterm review for the project was waived. The PMC consultants under the Rural Roads Sector I Project developed a road safety guide and road safety campaign materials. The TSC was entrusted with reviewing the road safety program in the project states.
Land Availability Each State shall ensure that the IA implements the provisions of the CPF for all Subprojects as agreed upon with ADB and in conformity with all relevant applicable laws and regulations of the Borrower and the State.	LA, Schedule 5 Para. 11	**Complied with.** The government and ADB agreed upon the CPF to provide guidance and mitigation measures for voluntary land donation, and to ensure proper community participation during implementation**.** During project implementation, the CPF provisions were implemented accordingly.
Each State shall ensure that the IA shall, subject to compliance with the relevant provisions of the CPF and EAF/ECOP (and related IEE) and in accordance with all relevant applicable laws and regulations of the Borrower/State, acquire or make available the land and rights to land free from any encumbrances, clear the utilities, trees and any other obstruction from such land, required for commencement of construction activities in accordance with the schedule agreed under the related civil works contract.	LA, Schedule 5 Para. 12	**Complied with.** The project appraisal confirmed that the width of the existing roads would be sufficient to accommodate the right-of-way of about 7.5 meters. As a result, minimal acquisition of land was required for shoulder adjustment and drainage construction. No affected persons were relocated because the scale of land acquisition was minor. During implementation, pre-construction activities were completed before commencement of civil works in all project states.
Each State shall ensure that (a) the respective IA shall (i) carry out the community consultation process for all Subprojects in accordance with the PMGSY Guidelines as supplemented by the CPF and the related IEE, (ii) disseminate the information on process of land transfer/availability as the case may be, support/assistance provisions and grievance procedures to the Project affected communities in a timely manner so that all related issues are resolved before awarding Work contracts, and (iii) ensure that in case of voluntary land donations/transfer there are undertaken in a transparent manner under proper documentation, and avoid any kind of coercion or forced donations/transfer; and in this regard shall not exercise any eminent domain or related mechanisms that may be deemed to be compulsory acquisition of land; and (b) the details of land made available in accordance with the procedures prescribed in the PMGSY Guidelines, are reflected in the local land records in a timely manner, to avoid any disputes.	LA, Schedule 5 Para. 13	**Complied with.** Documentation for each subproject was prepared according to the CPF, EAF, and ECOP. The procedures in the CPF were followed to ensure participatory project preparation and that the process for land donation or transfer was undertaken in a transparent manner. During implementation, the PIUs carried out the community consultation process for all subprojects in accordance with the PMGSY guidelines as supplemented by the CPF, including the dissemination of information on the process of land transfer or land availability, support provisions, and grievance procedures to project-affected communities in a timely fashion. The implementing agencies ensured that voluntary land donations or transfers were undertaken in a transparent manner and avoided any kind of coercion or forced donation or transfer.
Bid Document Execution of Civil Works Contracts Subject to compliance with the requirements of CPF and EAF/ECOP (and related IEE), MORD shall ensure that the bid documents include the environmental management plan (EMP) and environmental checklist, to enable the contractor to	LA, Schedule 5 Para. 14	**Complied with.** The bid documents included the EMP and the environmental checklist. ADB reviewed sample documents. In general, all EMP requirements have been met.

Particulars	Reference in Loan Agreement	Status of Compliance
include the cost required for implementing the EMP in its bid.		
Subject to compliance with the requirements of CPF and EAF/ECOP (and related IEE), the State shall: (i) acquire or make available on a timely basis the land and rights in land, free from any encumbrances; (ii) clear the utilities, trees and any other obstruction from such land, on a timely basis, i.e., strictly in accordance with the schedule as agreed under the related civil works contract, as required for construction activities relating to each section of the related civil works contract under the Subproject.	LA, Schedule 5 Para. 15	**Partially complied with.** Land donation was generally done on time. The government obtained timely clearances for construction from the forest, railway, and revenue departments wherever required. However, land was not available on time for some subprojects, causing project implementation delays.
Each State shall ensure that subsequent to award of civil works contract under any Subproject, no section or part thereof under the civil works contract will be handed over to the contractor unless the applicable provisions of the CPF and the EAF/ECOP (and related IEE) have been complied with.	LA, Schedule 5 Para. 16	**Complied with.** No sections or part thereof were handed over to the contractor unless the applicable CPF, EAF, or ECOP provisions were complied with. Approvals were obtained from the competent authorities when necessary.
Each State shall ensure that any changes to the land alignment or environment impacts on account of detailed designs of related Subproject roads shall be subject to prior approval by ADB or related agency (MORD) as the case may be in accordance with the Subproject selection criteria and procedures included in Schedule 2 to the FFA.	LA, Schedule 5 Para. 17	**Complied with.** In case of any change to the land alignment or environmental impacts, such subproject roads were approved by ADB and the MORD.
Social Impacts Each State EA shall ensure that civil works contracts under the Project follow all applicable labor laws of the Borrower and the State and that the bid documents further include provisions to the effect that contractors: (i) carry out HIV/AIDS awareness programs for labor, and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (ii) follow and implement all statutory provisions on labor (including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts shall also include clauses for termination by the State in case of any breach of the stated provisions by the contractors.	LA, Schedule 5 Para. 18	**Complied with.** The bid documents and civil works contracts financed under the project included provisions to disseminate information at work sites on the risk of sexually transmitted infections and HIV/AIDS as part of the health and safety measures for those employed during construction, and followed legally mandated provisions on health, welfare, sanitation, and appropriate working conditions for construction workers at camp sites. The provisions also complied with all applicable labor laws, including the non-employment of child labor and equal pay for equal work for women. During implementation, the government and PIUs monitored the implementation of the contracts.
Each State shall ensure acceptance of the Project through effective community participation in selecting and implementing Subprojects in accordance with the PMGSY Guidelines as supplemented by the CPF (and related IEE).	LA, Schedule 5 Para. 19	**Complied with.** In selecting and implementing the subprojects, the implementation agencies ensured that project information was disseminated and communities were consulted in accordance with the PMGSY guidelines as supplemented by the CPF.
In case of any significant impacts on Scheduled Tribes under any additional Subproject, these shall follow the requirements as set out in the CPF as agreed by ADB. As also laid down in the CPF, for any impact on land involving traditional and tenure rights of the Scheduled Tribes, the legal provisions laid down by the Borrower and the State pertaining to land transfer shall be duly followed.	LA, Schedule 5 Para. 20	**Complied with.** In areas of scheduled tribes, the government and PIUs followed the CPF's requirements for any impact on land involving traditional and tenure rights of the scheduled tribes.

Particulars	Reference in Loan Agreement	Status of Compliance
Environment Only those Subprojects that meet the eligibility requirements set out in Subproject selection criteria and procedures included in Schedule 2 to the FFA, and which adhere to the relevant requirements of the PMGSY Guidelines, the CPF, the EAF (and related IEE) and other applicable guidelines for Subproject implementation, shall be eligible for financing from the Loan proceeds. The State shall monitor the implementation of Subprojects through to the completion of each Subproject.	LA, Schedule 5 Para. 21	**Complied with.** As agreed, only those subprojects that met the subproject selection criteria and procedures were selected and financed by the loan proceeds. The government and PIUs monitored the project progress closely, and quarterly progress reports were submitted to ADB in a timely manner.
Each State shall ensure that: (i) Subprojects shall be implemented in accordance with the EAF and related IEE, (ii) relevant provisions of the ECOP identified in the Subproject preparation stage are incorporated into the Subproject designs and followed during Subproject design, construction, operation and maintenance, and (iii) adequate Project documentation related to environment, as mutually acceptable to ADB, and MORD, environmental checklists, and reports on environmental monitoring shall be properly maintained.	LA, Schedule 5 Para. 22	**Complied with.** The subprojects were implemented in accordance with the EAF and related IEE. The project states incorporated standard EMPs in their bidding documents for civil works. The contractors responded to the EAF and ECOP requirements, and included the costs in their bills of quantities. The documentation of environmental issues and monitoring reports was properly maintained.
Each State shall require the respective IA to implement the Project in accordance with all applicable laws and regulations regarding wildlife and protected areas/forest areas for Subprojects that involve roads passing through forest areas and address these under the relevant IEE for such Subprojects. No construction work shall be undertaken on sections of Subprojects that pass through a forest reserve unless clearance is granted in accordance with applicable laws and regulations of the Borrower and each State, and no Subproject shall be located within or close to an environmentally sensitive area such as a wildlife sanctuary, national park, or other areas with significant ecological functions that are declared as national parks, sanctuaries, or national/international cultural heritage.	LA, Schedule 5 Para. 23	**Complied with.** The governments and PIUs, with help from the TSC, carefully implemented the environmental mitigation measures during project implementation; and the PICs carried out regular environmental monitoring. The ADB project review missions noted that implementation of the environmental safeguards in all project states was generally in order.
Subproject Selection and Approval Process; Subprojects Implementation The Borrower through MORD shall ensure that the Subprojects follow the selection criteria and are promptly processed for approval by ADB as described in detail in Subproject selection criteria and procedures included in Schedule 2 to the FFA.	LA, Schedule 5 Para. 24	**Complied with.** A total of 253 subproject roads were selected and prepared based on the subproject selection criteria and procedure under the PMGSY guidelines, and approved by ADB.
Performance Audit Without limiting the generality of Section 2.09 of the Project Agreement, MORD shall cause the State to allow ADB to carry out procurement audits during Project implementation as part of its regular review process.	LA, Schedule 5 Para. 25	**Complied with.** ADB's designated consultant performed regular procurement audits.
Project Performance Monitoring and Progress Reports Each State through the respective IA shall undertake periodic Subproject performance review under the Project and the Investment Program, in accordance with the Investment Program Performance Monitoring System, to evaluate the scope, implementation arrangements, progress and achievements of	LA, Schedule 5 Para. 26	**Partially complied with.** Performance reviews of the subprojects were undertaken regularly. The TSC implemented multiyear monitoring of the socioeconomic impacts of the project roads under the investment program. The monitoring reports, with survey results and evaluations for 2008 and 2009, were submitted to ADB. However,

Particulars	Reference in Loan Agreement	Status of Compliance
objectives of the Project and overall Investment Program.		no subsequent monitoring was carried out.
Notwithstanding the generality of Section 2.08 of the Project Agreements, each State through the respective IA shall submit to MORD the monthly progress reports on the implementation of the Subprojects under the Project. Based on these reports, MORD through NRRDA shall prepare and provide ADB with quarterly progress reports on the implementation of the Subprojects under the Project within 45 days of the close of each quarter.	LA, Schedule 5 Para. 27	**Complied with.** The project implementing agencies prepared all monthly project progress reports. Consolidated project quarterly progress reports were submitted by the NRRDA to ADB in a timely manner and covered all ongoing projects under the investment program.
Reports and Review (a) Without limiting the generality of Section 2.08(c) of the Project Agreements and Section 7.04(d) of the Loan Regulations, the Borrower shall submit to ADB a project completion report within 3 months of physical completion of the Project. The report shall include a detailed evaluation of the Project, covering the design, costs, contractors' and consultants' performance, social and economic impact, economic rate of return, implementation of social and environmental safeguards measures and other details relating to Project, as may be requested by ADB. (b) ADB, the Borrower, and each State, shall meet regularly as required to discuss Project progress and any changes to implementation arrangements or remedial measures required to be undertaken towards achieving overall Project and investment Program objectives.	LA, Schedule 5 Para. 28	**Complied with.** The NRRDA prepared a project completion report generally adhering to the format requested by ADB that was submitted to ADB before the PCR mission. During implementation, ADB conducted regular review missions for the project that combined the reviews for other projects under the investment program. Several tripartite meetings were held to discuss critical issues regarding project implementation.
Financial Management MORD and West Bengal shall (a) maintain separate accounts for the Project and for its overall operations; (b) have such accounts and related financial statements (balance sheet, statement of income and expenses, and related statements) audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; and (c) furnish to ADB, promptly after their preparation but in any event not later than nine (9) months after the close of the fiscal year to which they relate, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of the Loan Agreement as well as on the use of the procedures for imprest account/statement of expenditures), all in the English language. MORD and West Bengal shall furnish to ADB such further information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.	PA Section 2.09	**Complied with.** The MORD and West Bengal maintained separate accounts for the project, which was audited annually.
MORD and Assam shall (a) maintain separate accounts for the Project and for its overall operations; (b) have such accounts and related financial statements (balance sheet, statement of income and expenses, and related statements) audited annually,	PA Section 2.09	**Complied with.** The MORD and Assam maintained separate accounts for the project, which was audited annually.

Particulars	Reference in Loan Agreement	Status of Compliance
in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; and (c) furnish to ADB, promptly after their preparation but in any event not later than nine (9) months after the close of the fiscal year to which they relate, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of the Loan Agreement as well as on the use of the procedures for imprest account/statement of expenditures), all in the English language. MORD and West Bengal shall furnish to ADB such further information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.		

ADB = Asian Development Bank, CPF = community participation framework, EA = executing agency, EAF = environmental assessment and review framework, ECOP = environment code of practice, EMP = environmental management plan, FFA = framework financing agreement, IA = implementing agency, IEE = initial environmental examination, LA = loan agreement, MORD = Ministry of Rural Development, NRRDA = National Rural Roads Development Agency, PA = project agreement, PCR = project completion report, PIC = project implementation consultant, PIU = project implementation unit, PMGSY = *Pradhan Mantri Gram Sadhak Yojana* (Prime Minister's Rural Roads Program), QCBS = quality- and cost-based selection, SRRDA = State Rural Roads Development Agency, TSC = technical support consultant.
Source: ADB project completion review mission.

SUMMARY OF CIVIL WORKS CONTRACT PACKAGES

No.	State	No. of Contracts	No. of Roads	Total Length (km)	Procurement Method	Contract Dates	Contract Cost (Rs million)	Actual Cost	
								Total (Rs million)	ADB Financing ($ million)
Road Connectivity									
1.	Assam	85	106	900	NCB	7 Jan 2009–2 Aug 2012	5,588.20	5,585.60	46.38
2.	West Bengal	99	100	807.59	NCB	7Jan 2009–2 Aug 2012	2,942.30	2,942.30	75.35
	Total	**184**	**206**	**1,707.59**			**8,530.50**	**8,527.90**	**121.73**

ADB = Asian Development Bank, km = kilometer, NCB = national competitive bidding.
Sources: Implementing agencies; ADB project completion review mission.

ECONOMIC REEVALUATION

A. General

1. The Asian Development Bank (ADB) project completion review (PCR) mission conducted an economic reevaluation of the project by comparing with- and without-project cases, using a similar methodology to that used at appraisal and input from the updated traffic and economic data. In the without-project case, it was assumed that the original state of the roads would be retained. In the with-project case, the roads were constructed and/or upgraded enabling vehicles to drive at faster speeds on the improved roads with lower operating costs and less travel time. Economic benefits were estimated by comparing the with- and without-project cases. The economic internal rate of return (EIRR) was calculated and sensitivity was tested. The economic reevaluation was carried out for the entire project, as well as separately for the project states (Assam and West Bengal).

B. Traffic Survey and Analysis

2. During project preparation, the technical support consultant conducted a baseline traffic survey in June 2008 on the selected sample roads, including 30 project roads and 10 control roads for each state. During the ADB PCR mission, a due diligence traffic survey was conducted during February–March 2016 that collected the actual traffic accounts of 16 sample roads in each state. Actual traffic counts for 12 hours were collected by vehicle type, including cars, jeeps, vans, two- and three-wheeled vehicles, light commercial vehicles (LCVs), medium commercial vehicles (MCVs), trucks, and tractors. A comparison of the actual traffic counts after project completion with those at baseline revealed a significant increase in both project states—about 32.9% in Assam and 132.7% in West Bengal. Table A10.1 summarizes the traffic surveys and increase rates.

Table A10.1: Actual Traffic in Assam
(vehicle, AADT)

	Truck	Bus	Tractor with Trailer	MCV	LCV	Car/Jeep/ Van/3W	2W	Total
Baseline (2008)								
Assam	6	1	9	6	17	28	65	**133**
West Bengal	2	0	13	5	14	25	72	**129**
At PCR (2016)								
Assam	8	2	9	11	21	40	86	**177**
West Bengal	10	1	16	14	28	82	151	**301**
Average growth (2008–2016)								
Assam	41.7%	60.7%	3.9%	67.0%	18.3%	41.9%	32.1%	32.9%
West Bengal	488.8%	368.8%	25.5%	171.8%	106.7%	232.7%	110.3%	132.7%
Average growth per year								
Assam	4.5%	6.1%	0.5%	6.6%	2.1%	4.5%	3.5%	**3.6%**
West Bengal	24.8%	21.3%	2.9%	13.3%	9.5%	16.2%	9.7%	**11.1%**

2/W = two-wheeled vehicle, 3/W = three-wheeled vehicle, AADT = annual average daily traffic, MCV = medium commercial vehicle, LCV = light commercial vehicle, PCR = project completion report.
Source: Technical support consultants, Asian Development Bank project completion report mission.

3. Based on the actual traffic and analysis, increase rates for future traffic on the project roads were adjusted by assuming that (i) socioeconomic development would be robust and

generate more traffic; (ii) passenger traffic, especially public transport services, would increase more rapidly; and (iii) increase rates would slow after 2020. Table A10.2 shows the adjusted traffic increase rates by vehicle type. These rates are higher than at appraisal, which reflects higher than anticipated traffic volumes and faster socioeconomic development in the project area. The traffic forecast was made accordingly and the result used in the economic reevaluation.

Table A10.2: Adjusted Traffic Growth Rate
(per year)

	Truck	Bus	Tractor with Trailer	MCV	LCV	Car, Jeep, Van, 3W	2W	Average
Assam								
2017–2020	10.0%	12.0%	8.0%	8.0%	10.0%	12.0%	10.0%	10.3%
2021–	6.0%	9.0%	6.0%	6.0%	6.0%	10.0%	8.0%	8.0%
West Bengal								
2017–2020	7.0%	9.0%	2.0%	6.0%	6.0%	8.0%	7.0%	6.9%
2021–	5.0%	5.0%	2.0%	4.0%	5.0%	5.0%	5.0%	4.8%

2W = two-wheeled vehicle, 3W = three-wheeled vehicle, MCV = medium commercial vehicle, LCV = light commercial vehicle.
Source: Asian Development Bank project completion review mission.

C. Project Costs

4. The project costs consist of capital and maintenance costs. The actual capital cost for the whole project in terms of Indian rupees was approximately 16.1% higher than estimated at appraisal. The actual unit cost per kilometer (km) for the road connectivity component rose by 8% compared with that at appraisal, mainly due to higher contract prices. Actual annual investment costs for the subprojects in Assam and West Bengal were used in the economic reevaluation. In light of existing road conditions and future traffic levels, it was assumed that the routine maintenance cost would be Rs23,500 per year per km.[1] It was also assumed that periodic maintenance would constitute about 20% of the capital cost and would take place every 5 years.[2] Financial costs for both capital and maintenance were converted into economic costs with a standard conversion factor of 0.85 in the project area. All economic costs were estimated in constant 2016 prices.

D. Economic Benefits

5. Using the same methodology as at appraisal, the main sources of economic benefits considered include vehicle operating cost (VOC) savings and passenger-travel-time cost savings. The benefit calculation only considered normal and diverted traffic, and excluded induced traffic. The VOC savings were recalculated using unit VOC data for different degrees of road roughness, which were adopted from the appraisal calculation but adjusted for inflation. The VOC savings in Indian rupees per vehicle-km were estimated at Rs32.2 for trucks; Rs30.6 for buses; Rs25.7 for tractors with trailers; Rs30.2 for MCVs; Rs25.1 for light commercial vehicles (LCVs); Rs8.3 for cars, jeeps, vans, and three-wheelers; and Rs2.5 for two-wheelers. Average passenger vehicle speeds were assumed to be 40–50 km/hour for with-project cases

[1] The average routine maintenance cost was Rs12,000–Rs35,000 per km for the Prime Minister's Rural Roads Program (PMGSY) roads.
[2] The PMGSY guidelines state that periodic maintenance is to be conducted every 5 years.

and 25 km/hour for without-project cases. The passenger-travel-time cost was derived from the average income per capita of the project states in FY2015, and was assumed to increase 5%–8% each year to reflect increased incomes. Other factors taken into account in the calculation of time cost savings include average vehicle loads, the percentage of work-related trips, time costs for different road users, and travel speeds for different types of passenger vehicles. The benefit calculation results showed that the VOC savings constituted a major portion (about 88%) of total benefits in the early years of the project operation, but passenger-travel-time cost benefits were projected to increase rapidly along with socioeconomic development and increased incomes (about 30% in 2030).

E. Economic Internal Rate of Return Reevaluation

6. The recalculated EIRR was 17.0% for the whole project: 12.5% for Assam, and 23.1% for West Bengal. The EIRR for Assam is lower than the 15.6% estimated at appraisal, mainly due to higher investment costs and a prolonged implementation period. The EIRR for West Bengal is higher than the 20.1% estimated at appraisal, mainly due to much higher traffic on the sample roads. The recalculated EIRRs are above the ADB-recommended social discount rate of 12% and the project can be considered economically viable. The EIRRs were subjected to a sensitivity analysis, the results of which show that the project remains economically viable for all tested scenarios. In the case of a combined 20% maintenance cost increase and 20% benefit reduction, the EIRR for the entire project would be 13.8%. The sensitivity test also showed that the EIRR is more sensitive to changes in benefits. Therefore, the government should focus more on socioeconomic development in the project area, and implement policies to stimulate transport services and increase villagers' incomes. The results of the sensitivity tests are in Table A10.3.

Table A10.3: Sensitivity Analysis

	Scenarios	**EIRR** (%)	**ENPV @ 12%** (Rs million)
Base Case		**17.0%**	**9,033.6**
Sensitivity Tests			
1	Maintenance cost 10% higher	16.9	8,750.0
2	Maintenance cost 20% higher	16.8	8,466.4
3	Benefits 10% higher	18.4	11,761.1
4	Benefits 20% higher	19.6	14,488.6
5	Benefits 10% lower	15.7	6,306.1
6	Benefits 20% lower	14.2	3,578.7
7	Maintenance cost 10% higher and benefits 10% lower	15.5	6,022.5
8	Maintenance cost 20% higher and benefits 20% lower	13.8	3,011.4

EIRR = economic internal rate of return, ENPV = economic net present value
Source: Asian Development Bank project completion review mission.

7. The detailed cash flows of the EIRR calculations for the entire project as well as for both states are in Tables A10.4–A10.6.

Table A10.4: Economic Reevaluation—Whole Project
(Rs million)

	Cost			Benefit			Net	
Year	Capital	M	Total	VOC	Time Cost	Total	Benefit	NPV
2008	1,478.59		1,478.6				(1,478.6)	(3,660.9)
2009	1,964.70		1,964.7				(1,964.7)	(4,343.3)
2010	1,540.87		1,540.9				(1,540.9)	(3,041.4)
2011	1,211.29	3.58	1,214.9	347.4	42.1	389.5	(825.4)	(1,454.7)
2012	739.79	10.75	750.5	578.9	70.2	649.1	(101.4)	(159.6)
2013	754.82	17.92	772.7	926.3	112.3	1,038.6	265.8	373.5
2014		35.84	35.8	1,157.9	140.3	1,298.2	1,262.3	1,583.5
2015		36.92	36.9	1,253.6	165.7	1,419.2	1,382.3	1,548.2
2016		38.03	38.0	1,361.7	199.1	1,560.8	1,522.7	1,522.7
2017		35.84	35.8	1,465.6	229.3	1,694.9	1,659.1	1,481.3
2018	1,449.74	36.92	1,486.7	1,578.3	264.3	1,842.6	355.9	283.8
2019		38.03	38.0	1,700.5	305.0	2,005.4	1,967.4	1,400.4
2020		39.17	39.2	1,833.1	352.1	2,185.2	2,146.1	1,363.9
2021		40.34	40.3	1,935.8	397.5	2,333.3	2,292.9	1,301.1
2022		35.84	35.8	2,044.8	449.2	2,494.0	2,458.2	1,245.4
2023	1,449.74	36.92	1,486.7	2,160.6	508.2	2,668.8	1,182.2	534.8
2024		38.03	38.0	2,283.7	575.6	2,859.3	2,821.3	1,139.5
2025		39.17	39.2	2,414.5	652.8	3,067.3	3,028.1	1,092.0
2026		40.34	40.3	2,553.5	741.2	3,294.7	3,254.4	1,047.8
2027		35.84	35.8	2,701.4	842.6	3,544.1	3,508.2	1,008.5
2028	1,449.74	36.92	1,486.7	2,858.8	959.1	3,817.9	2,331.2	598.4
2029		38.03	38.0	3,026.2	1,093.1	4,119.4	4,081.3	935.3
2030		39.17	39.2	3,204.5	1,247.4	4,451.9	4,412.8	902.9
2031		40.34	40.3	3,394.5	1,425.2	4,819.7	4,779.4	873.2
2032		35.84	35.8	3,596.8	1,630.5	5,227.3	5,191.5	846.8
2033	1,449.74	36.92	1,486.7	3,812.5	1,867.7	5,680.2	4,193.6	610.8
							NPV:	9,033.6
							EIRR:	**17.0%**
							Discount Rate:	12%

( ) = negative, EIRR = economic internal rate of return, M = maintenance, NPV = net present value, VOC = vehicle operating cost.
Source: Asian Development Bank project completion review mission.

Table A10.5: Economic Reevaluation—Assam
(Rs million)

	Cost			Benefit			Net	
Year	Capital	M	Total	VOC	Time Cost	Total	Benefit	NPV
2008	912.87		912.9				(912.9)	(2,260.2)
2009	1,212.98		1,213.0				(1,213.0)	(2,681.5)
2010	951.32		951.3				(951.3)	(1,877.7)
2011	747.84	1.9	749.8	151.3	13.0	164.4	(585.4)	(1,031.7)
2012	456.74	5.8	462.5	252.2	21.7	273.9	(188.6)	(296.7)
2013	466.02	9.6	475.6	403.6	34.7	438.3	(37.3)	(52.4)
2014		19.2	19.2	504.5	43.4	547.9	528.7	663.2
2015		19.7	19.7	522.6	48.9	571.4	551.7	617.9
2016		20.3	20.3	541.5	55.1	596.6	576.2	576.2
2017		19.2	19.2	594.7	66.3	661.0	641.9	573.1
2018	949.60	19.7	969.3	653.2	79.9	733.1	(236.2)	(188.3)
2019		20.3	20.3	717.6	96.2	813.8	793.5	564.8
2020		20.9	20.9	788.5	115.9	904.4	883.4	561.4
2021		21.6	21.6	844.0	137.1	981.1	959.5	544.4
2022		19.2	19.2	903.7	162.1	1,065.8	1,046.6	530.2
2023	949.60	19.7	969.3	967.9	191.6	1,159.5	190.2	86.0
2024		20.3	20.3	1,036.8	226.6	1,263.4	1,243.1	502.1
2025		20.9	20.9	1,110.9	268.0	1,378.9	1,358.0	489.7
2026		21.6	21.6	1,190.6	317.0	1,507.6	1,486.0	478.5
2027		19.2	19.2	1,276.3	374.9	1,651.2	1,632.1	469.2
2028	949.60	19.7	969.3	1,368.5	443.5	1,812.0	842.7	216.3
2029		20.3	20.3	1,467.7	524.6	1,992.4	1,972.0	451.9
2030		20.9	20.9	1,574.6	620.6	2,195.2	2,174.2	444.9
2031		21.6	21.6	1,689.6	734.2	2,423.8	2,402.2	438.9
2032		19.2	19.2	1,813.5	868.7	2,682.2	2,663.0	434.4
2033	949.60	19.7	969.3	1,947.0	1,027.8	2,974.8	2,005.5	292.1
							NPV:	546.6
							EIRR:	**12.5%**
							Discount Rate:	12%

( ) = negative, EIRR = economic internal rate of return, M = maintenance, NPV = net present value, VOC = vehicle operating cost.
Source: Asian Development Bank project completion review mission.

Table A10.6: Economic Reevaluation—West Bengal
(Rs million)

	Cost			Benefit			Net	
Year	Capital	M	Total	VOC	Time Cost	Total	Benefit	NPV
2008	565.72		565.7				(565.7)	(1,400.7)
2009	751.71		751.7				(751.7)	(1,661.8)
2010	589.55		589.6				(589.6)	(1,163.7)
2011	463.45	1.7	465.1	196.0	29.1	225.1	(240.0)	(423.0)
2012	283.05	5.0	288.1	326.7	48.5	375.2	87.1	137.1
2013	288.80	8.3	297.1	522.7	77.6	600.3	303.1	425.9
2014		16.7	16.7	653.4	96.9	750.3	733.7	920.3
2015		17.2	17.2	731.0	116.8	847.8	830.6	930.3
2016		17.7	17.7	820.2	144.0	964.2	946.5	946.5
2017		16.7	16.7	870.9	163.0	1,033.9	1,017.2	908.2
2018	500.20	17.2	517.4	925.1	184.4	1,109.5	592.1	472.0
2019		17.7	17.7	982.9	208.7	1,191.6	1,173.9	835.6
2020		18.2	18.2	1,044.6	236.2	1,280.9	1,262.6	802.4
2021		18.8	18.8	1,091.8	260.4	1,352.2	1,333.4	756.6
2022		16.7	16.7	1,141.1	287.1	1,428.2	1,411.6	715.1
2023	500.20	17.2	517.4	1,192.8	316.6	1,509.3	992.0	448.7
2024		17.7	17.7	1,246.9	349.0	1,595.9	1,578.2	637.4
2025		18.2	18.2	1,303.6	384.8	1,688.4	1,670.1	602.3
2026		18.8	18.8	1,362.9	424.2	1,787.2	1,768.4	569.4
2027		16.7	16.7	1,425.1	467.7	1,892.8	1,876.2	539.4
2028	500.20	17.2	517.4	1,490.3	515.6	2,005.9	1,488.5	382.1
2029		17.7	17.7	1,558.5	568.5	2,127.0	2,109.3	483.4
2030		18.2	18.2	1,630.0	626.8	2,256.8	2,238.5	458.0
2031		18.8	18.8	1,704.9	691.0	2,395.9	2,377.1	434.3
2032		16.7	16.7	1,783.3	761.8	2,545.2	2,528.5	412.5
2033	500.20	17.2	517.4	1,865.5	839.9	2,705.5	2,188.1	318.7
							NPV:	8,487.0
							EIRR:	**23.1%**
							Discount Rate:	12%

( ) = negative, EIRR = economic internal rate of return, M = maintenance, NPV = net present value, VOC = vehicle operating cost.
Source: Asian Development Bank project completion review mission.

SUMMARY OF SOCIOECONOMIC IMPACTS

A. Introduction

1. During implementation of the investment program, the technical support consultant (TSC) undertook a before–after study to gauge the project's socioeconomic impact. The surveys covered a sample of 45 habitations in 12 districts in the states of Assam, West Bengal, and Orissa.[1] To update the analysis for Assam and West Bengal, where the project roads under the third loan are located, a due diligence survey was conducted during February–March 2016 covering four districts each in the two states, including a quick traffic survey and social impact analysis. All data and analysis in this section are derived from the socioeconomic impact assessment report for Assam, West Bengal, and Orissa prepared by the TSC in 2008 and the due diligence survey conducted during February–March 2016.[2]

B. Socioeconomic Impacts

2. **Improved connectivity**. In accordance with its main objective, roads developed under the Prime Minister's Rural Roads Program (PMGSY) have improved connectivity to and from rural habitations. For rural communities, the roads provide better access to government offices, markets, financial institutions, employment opportunities, hospitals, educational institutions, information, and family and friends who live elsewhere. According to household surveys conducted in the eight districts, the average distance traveled by local inhabitants to their workplaces increased by about 4 km, whereas their average travel time decreased by 45 minutes. This demonstrates that improved connectivity enables inhabitants to expand the area where they can seek employment and that, despite increased distances, travel time decreases. During the due diligence survey during February–March 2016, villagers in Sehalpara and Mathurapur in North 24 Pargana district in West Bengal reported that the travel time to the nearest market center (7 km away) was about 1.5 hours by bicycle (more during the rainy season as the road used to be muddy and slippery) prior to connectivity. With improved connectivity, the journey takes about 15 minutes by motorcycle or 30 minutes by bicycle. Similarly, villagers in Banaikuchi village in Darrang district in Assam reported that it used to take about 1 hour to reach the circle office and market center at Patharighat, but now takes 15 minutes by motorcycle. Reaching National Highway 52 to connect to major cities like Tezpur and Guwahati used to take 1.5 hours, but now takes 0.5 hours by motorcycle and other passenger modes that use the new road. Villagers of Dhumsai village, a tribal habitation in West Midnapur district in West Bengal, reported that it was not possible for a vehicle to come to their village before the project because the road used to be a track. During the rainy season it was difficult even to walk on the road, and vehicles used to drop the villagers and essential commodities at Kisoreka, about 6 kilometers (km) away from the village.

3. PMGSY roads also provide government workers—including health workers, teachers, and agriculture extension workers—with easier access to habitations to provide services and information to rural communities. The roads also promote greater social interaction between villagers and external residents, most evidently through an increase in the number of marriages

[1] The survey in the 12 districts covered 45 sample habitations on the project roads, and 100 households were selected randomly from each. About 450 people were interviewed, of whom 248 (55%) were male, and 202 (45%) were female. In addition, 45 separate focus group discussions were conducted.

[2] ADB. 2009. *Socio-Economic Impact Assessment Report, Orissa, Assam, West Bengal—Rural Roads Sector II Investment Program.* Consultant's Report. Manila (Loan 2248-IND).

that have taken place in the communities since connectivity, and (on average) a three to four times increase in the number of trips made for social interaction.

4. **Providing transport service.** Buses, jeeps, vans, and three-wheeled vehicles provide regular public transportation between newly connected villages and nearby towns and cities. In sample habitations, daily public transport services increased by an average of 115% for buses and 200% for jeeps, vans, and three-wheeled vehicles.

5. The study observed an overall increase in private ownership of motorized and non-motorized vehicles in project habitations. Most notably, there has been a large increase in the number of motorcycles and three-wheeled vehicles. Especially in West Bengal, the use of three-wheeled (locally known as engine vans) for passenger as well as freight transport is noticeable in the new connections. Motorcycles are nearly always operated by men, but in a few sample habitations women were also using scooters or mopeds. Some female health workers were using scooters or mopeds and bicycles to travel between habitations. Overall, there has been a decrease in the number of bicycles, but it was observed that this is the main mode of transportation used by students to reach school. There was occasional movement of bullock carts on the rural roads, but their numbers were negligible.

6. **Government services accessibility.** The central and state governments operate a variety of schemes and programs to deliver basic social infrastructure to rural areas. The government has identified several elements of social and economic infrastructure critical to the quality of rural life, including infrastructure, livelihoods, education, health, training and employment, welfare, and governance.

7. Based on the focus group discussions, most rural inhabitants before the project had difficulty obtaining information about various government assistance schemes and even more difficulty accessing them. Due to the improved connectivity, rural populations now have better access to all government schemes through better access to information at government offices at the block and district level, as well as being informed through a variety of media. Specific government schemes operating in the habitations are discussed in subsequent sections.

8. **Improved livelihood.** Improved connectivity has increased livelihood opportunities for rural inhabitants. The surveys of sample habitations showed that better access to markets and other government programs have led to an average increase of about 80% (Rs3,500–Rs6,300) in monthly income levels in the sample habitations. Improved links have also increased overall per capita expenditure levels. Average per capita monthly expenditure increased by 65% (from Rs3,200 to Rs5,280) in the sample habitations. Focus group discussions revealed a high level of mobile phone use as well as some computer and internet use, indicating that the purchase of personal electronics is contributing to the increase in spending (per capita spending has increased by as much as 50%). Savings levels were noticed to have increased among all socioeconomic groups. Focus group discussions indicated that, after the project, the expensive purchases among villagers have typically been motorcycles, three-wheeled vehicles, and agricultural inputs. With better connectivity and access to nearby towns, service centers, and markets, the villagers believed that their income as well as saving levels will increase in the long run.

9. **Agricultural development.** Agriculture is the main source of livelihood in project-affected areas. Transport improvements have helped farmers in two primary ways: (i) through better access to inputs such as knowledge, equipment, and materials, which improves yield and reduces risk; and (ii) reduced transport cost to markets.

10. In the project states, the extension services offered by government agricultural extension officers and *gram sewaks* (village-level officers) to the habitations increased, along with the number of visits by these officers. Wider access to knowledge has led to more farmers using scientific approaches to farming, such as crop diversification and the incorporation of fertilizers and pesticides. Better connectivity has also helped farmers to be informed of existing and new government schemes, including ongoing schemes such as the Promotion of Integrated Pest Management that started in 1991; the Campaign for Seed Treatment, which began in 2007;[3] and the Rashtriya Krishi Vikas Yojana (National Agriculture Development Scheme), which began under the Eleventh Five Year Plan.[4] The percentage of farmers using crop diversification techniques has increased by about 20% (from 16.4% to 19.85%), and this will continue to increase. The mechanization of farming was observed in some habitations. Tractors and threshing machines have led to a more efficient, time-saving, and profitable cultivation process. Farmers also indicated that there has been a change in cropping patterns; due to improved efficiency and inputs, farmers are now switching from food crops to cash crops such as vegetables. Cropping has also become more intense due to the improved agricultural trade.

11. The roads have allowed more farmers to visit *haats* (nearby markets). On average about 45% (36.7%–53.2%) more farmers are now visiting *haats* regularly. The average number of visits per month has also increased. Connectivity has also reduced transport costs to markets by increasing the amount of produce that can be transported and reducing the amount of produce spoiled or damaged in transit. Previously, farmers, both men and women, would either use bullock carts to transport large loads or carry small loads such as vegetables on the back of a bicycle or on their heads while walking. After the connectivity project, farmers can use three-wheeled vehicles, tractors, and motorcycles to bring products quickly and efficiently to the *haats* or nearest connection point. Farmers (300 respondents) reported an approximately 20% reduction in the amount of produce spoiled, wasted, or damaged in transit, with many more products able to reach the market. The survey observed trucks destined for outside West Bengal loading seasonal vegetables at Sehalpara village, and new cold storage units at Anandpur in West Midnapur district.

12. **Government employment programs.** Increased connectivity has improved the delivery and implementation of different types of schemes operated by the central and state governments. Qualifying villagers have subscribed to employment programs under the National Rural Employment Guarantee Act, which was established in 2005. The act aims to enhance livelihood security in rural areas by providing at least 100 days of wage employment each year to every household whose adult members undertake unskilled manual work. The work includes the construction of non-PMGSY roads within the habitation, water conservation and harvesting structures, flood control and protection works, and irrigation projects.[5] The PMGSY implementation used a large amount of local labor, with a total of 2,330 million person-days of labor, including 1,283 million person-days labor for women during FY2015–FY2016.[6] Most of the laborers used by the project were local residents.

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[3] Government of India. http://india.gov.in/citizen/agriculture/viewscheme.php?schemeid=1816; Government of India. http://ppqs.gov.in/seedtreatment.htm

[4] Government of India, Ministry of Agriculture and Farmer Welfare, Department of Agriculture and Cooperation. Rashtriya Krishi Vikas Yojana (RKVY). RKVY.nic.in

[5] Government of India. 2008. *NREGA Operating Guidelines.* New Delhi.

[6] Government of India, Ministry of Rural Development. The Mahatma Ghandi National Rural Employment Guarantee Act. nrega.nic.in

13. Most habitations operated multiple self-help groups for women. These groups were either started by different government programs like the National Rural Livelihood Mission and Integrated Watershed Management Project, or by nongovernment organizations. These schemes aim to raise poor families above the poverty line by providing training and assistance to set up income-generating enterprises. The schemes are based on local requirements. Most frequently, the groups are involved in women-owned or -operated microenterprises in the habitations or in the provision of midday meals for local schools.

14. **Female employment and gender empowerment.** Women have benefited greatly from improved connectivity. Road connectivity has increased women's mobility as they can now travel alone in buses, vans, three-wheeled vehicles, and on bicycles to and from nearby towns and cities. Focus group discussions revealed that improved connectivity has led to more women's self-help groups, as well as more women working outside the home as government workers, shopkeepers, and daily wage laborers. The construction of all-weather roads has enabled women workers to run non-government-based programs in rural areas and visit beneficiaries regularly, improve their skills through hands-on training, and collect the finished products for sale, as reported by women groups in Philobari village in Tinsukia district of Assam and in Kisoreka village in West Midnapur district of West Bengal.

15. Women's role in local governance has increased. Focus group discussions indicate that, in the project states, approximately 50% of the habitations had a woman as the *sarpanch* (the democratically-elected head of a village statutory institution of local self-government). This phenomenon is mostly driven by the legislated reservation of seats for women; however, improved connectivity has allowed female and male public servants to perform their jobs more effectively by having improved access to higher levels of government and to information.

16. Rural women from all socioeconomic backgrounds have benefited from the construction of all-weather roads. Most notably, there has been an overall improvement in access to health and education facilities for women. Travel times between habitations and government health facilities have decreased significantly leading to a reduction of maternal and neonatal deaths. In terms of education, parents are now more confident and willing to send their daughters to schools and colleges, as transportation to school, especially for higher levels of education, is more reliable. The government has provided free bicycles to female students in high schools, and children now cycle or take the bus to school or college in nearby towns; this was observed in all of the connected habitations.[7]

17. **Commercial activities.** The general level of commerce in rural habitations is low. The number of microenterprises at the habitation level has been low but slowly increasing. In the project states, the survey estimates that new microenterprises at the habitation level increased by about 30% (14–18), mainly in the form of small general stores. It was observed that villagers preferred to visit commercial clusters in nearby towns and cities to obtain higher-end goods and services. However, some shops have been established in larger habitations or in more congested areas where there is a critical mass of customers; these include grocery shops, tailors, motorcycle and bicycle repair shops, seed and fertilizer shops, barbers, and shoe repairers. In some sample habitations 1–2 hours away from bigger towns (i.e., Sehalpara in North 24 Pargana district and Anandpur in West Midnapur district of West Bengal), poultry

[7] The Government of Assam provides free bicycles to girl students in grades 8–9 belonging to below poverty line. The Government of West Bengal has declared a scheme titled "Sabooj Sathi" for distribution of bicycles to the students in grades 9–12 in all schools run, aided, or sponsored by the government.

farming and pisciculture have become significant industries, taking advantage of the all-weather connected roads.

18. Villagers have reliable access to organized financial services like banks and cooperative societies. Most villagers indicated they use their own savings to purchase motorcycles, but some indicated that they had taken out a loan for this purpose. For larger vehicles such as tractors, three-wheeled vehicles, and vans, farmers can access financing plans through dealers or banks located in nearby towns and service centers.

19. **Education.** Before connectivity was improved, most habitations had good access to primary and middle schools, but higher secondary schools were an average of 5 km away. This posed transportation problems, particularly during the rainy season. Children walked an average of 5–6 km to access higher education facilities. Improved connectivity has impacted education in three ways: (i) travel times to education facilities outside of habitations have been reduced, (ii) teacher attendance and the number of teachers in habitations have improved, and (iii) school enrollment and student attendance have improved due to safer travel.

20. Travel times to education facilities outside of habitations have decreased due to increased connectivity, and more young people are taking advantage of higher education opportunities in nearby towns and major cities. For example, in the habitation of Rohinikhas in Darrang district in Assam, the number of young people pursuing secondary education outside of the habitation has increased from 3 to 6. The proportion of inhabitants who had completed grade 12 and above increased from 21.1% to 22.2%, the proportion who had completed grades 10–12 increased from 41.3% to 42.6%, and the proportion who had completed grades 5–10 increased from 33.34% to 34.90%. The number of uneducated inhabitants decreased from 45.5% to 39.2%.

21. Increased connectivity has improved teacher attendance from 89.6% to 92.8% as well as the amount of time spent by teachers at the school. Villagers reported that, before the project, during the rainy season teachers would arrive late to school and leave early. Therefore, the increased teacher attendance rate alone may underrepresent the actual impact of connectivity on teacher attendance rates.

22. Improved transport has improved school attendance rates due to safer travel and the implementation of government schemes. The survey observed that female teachers account for around 60% of all teachers up to grade 8 (middle school), and that improved transportation has helped them to improve their attendance. The percentage of unenrolled children dropped from 45.9% to 32.4%. Teachers reported that improved connectivity has led to an increase in girls' attendance, especially in middle and high or higher secondary schools. Most parents mentioned that they were now more confident about sending their daughters to school unescorted. The government-sponsored midday meal scheme for students up to grade 8 (introduced in 1995) has helped improve student attendance rates and has increased employment for rural women, who are typically involved in organizing and cooking the midday meals. [8]

23. **Health and medical care.** Prior to improved connectivity, the availability of health services was reportedly poor in the habitations, despite many habitations having a multipurpose health worker to provide basic health care, including immunizations. Attendance rates of these health workers varied greatly and some spent very little time in each habitation due to long

[8] Government of India. www.mdm.nic.in

travel times. Transportation options for carrying sick people or pregnant women to health care institutions were by bullock carts or by hiring a tractor. Villagers of Dhumsai in West Midnapore district in West Bengal and Athalikandi in Cachhar district of Assam had to carry sick people on their shoulders as the road used to be full of mud through which it was impossible to take even a bullock cart.

24. Connectivity has improved rural communities' access to health care. Travel times to health care facilities have decreased on average by about 30 minutes (for the entire year) and by as much as 2 hours during the rainy season in some habitations. For those visiting a clinic or hospital at least once a month, the average frequency of their visits has tripled (based on 130 respondents).

25. Focus group discussions reported that multipurpose health workers are making more frequent visits and are spending more time in each community due to shorter travel times. Many now travel between the habitations they service by motorcycle, moped, or bicycle. Improved connectivity has also supported the implementation and delivery of the National Rural Health Mission, which aims to strengthen the Panchayati Raj institutions and promote access to improved healthcare through community health volunteers known as accredited social health activists.[9] The scheme also strengthens existing primary health care centers and community health centers. Neonatal and maternal health has improved due to all-weather connectivity, with difficult pregnancies and deliveries benefiting the most. The government implemented the Janani Suraksha Yojana and Sukhibhava Schemes in 2003, but without good connectivity, service delivery was very low.[10] Villagers, who are on average about 5 km from the health centers, report that the schemes are now fully used, with almost 100% of births taking place in government health care facilities. Most villagers take full advantage of the ambulatory services provided under the scheme through the National Ambulance Services and National Mobile Medical Units. Ambulatory care was rated as rapid and dependable.

26. **Land value and building materials.** Land prices in the sample habitations with improved connectivity increased on average by about four to five times. This can be partially attributed to better connectivity, but is also caused by factors such as (i) some nearby developing industries taking advantage of the government's industrialization policy, (ii) habitations having received a new or improved irrigation scheme during the period of road construction, (iii) an increase in the habitation's population, and (iv) villagers choosing to stay in the community instead of seeking employment elsewhere. Demand for land increased dramatically in some habitations. Land values in connected rural habitations are forecasted to continue to increase due to improved access coupled with increased demand.

27. Habitations with all-weather roads can now access permanent materials such as bricks, stones, concrete, and corrugated tin for construction. Some villages have also built brick-making facilities to provide building materials for the newly connected habitations.

[9] Government of India, Ministry of Health and Family Welfare. National Health Mission. nrhm.gov.in

[10] The two schemes are implemented in a combined manner. A cash incentive is paid to rural pregnant women below the poverty line for antenatal care, institutional care during delivery, and postpartum care. Women deliver in a government health care institution, such as teaching hospitals, district headquarters hospitals, area hospitals, community health centers, and other government hospitals. Government of India. http://www.nhp.gov.in/janani-suraksha-yojana-jsy-_pg

28. **HIV/AIDS and trafficking.** During the study and focus group discussions, no negative impact of the road related to HIV/AIDS transmission or human trafficking was identified in habitations affected by the project in the two states.

29. **Negative impacts.** Some negative impacts were observed or envisioned after completion of the project roads. The main impact is increased traffic. Large trucks travel the PMGSY roads, often at high speeds. Communities have raised the issue of safety, especially for children who use the roads to travel to school, mostly on bicycles. Villagers suggested the installation of prominent signage and speed breaks near community infrastructure. The survey noted that no major accidents causing serious injury or death have occurred on the project roads.

30. It is envisaged that improved roads will catalyze urbanization and commercialization. Forests and natural resources previously inaccessible to outsiders will become more accessible. If not properly managed, this may cause the depletion and/or illegal extraction of natural resources.

31. Improved connectivity and transportation have led rural inhabitants to seek job opportunities outside of their communities. In the short run, this is seen as a positive impact in providing additional livelihood opportunities to previously isolated populations. However, in focus group discussions, some inhabitants voiced concern that unskilled labor is already in short supply. In the medium and long run, the phenomenon of outward migration may negatively impact rural communities by draining the community of its productive workforce, especially those who have obtained higher education.

32. It was observed that some PMGSY roads are used by diverted traffic, including larger trucks, from main roads to take advantage of shorter distances to destinations and avoid paying user fees. This conflicts with the design life of the roads and interest of the local communities. In the case of the Silobari–Bandapara road in Kamrup Rural district of Assam, the local community has set up barricades to prevent larger vehicles diverted from the nearby National Highway from using the PMGSY road.

C. Conclusion

33. Improved connectivity has impacted rural living conditions by giving communities more reliable and rapid access to outside products, services, information, and social links. Conversely, external service and product providers and social contacts now have improved access to rural communities. The presence of all-weather roads has directly or indirectly contributed to improvements in connectivity, transportation, access to government facilities and services, livelihoods, commercial activities, education, health, land values, building materials, social interactions, and gender empowerment. The roads have acted as a catalyst for sustained improvements in living conditions, and will support continued development in rural India.

34. Overall, nearly all socioeconomic indicators for the connected habitations have increased. However, as previously mentioned, socioeconomic improvements and poverty alleviation cannot be attributed solely to improved road connectivity because various external factors contribute to higher standards of living, such as the implementation of government schemes and other infrastructure projects, as well as the development of nearby industries. Living conditions in the connected habitations continue to improve, and the number of households living below the poverty line is forecasted to continue to decrease.

35. The investment program is ADB's second intervention in rural roads in India, and the project has provided valuable lessons applicable to the design and implementation of subsequent rural roads projects that will help maximize socioeconomic gains. However, most importantly, the project has provided important lessons for evaluating subsequent rural road projects such as the Rural Connectivity Investment Program currently under implementation.

36. With more time for socioeconomic benefits to be realized, further evaluation of the project's impact will be useful. ADB and the government should closely monitor any negative impacts that may develop, especially in the areas of road safety, illegal access, extraction of natural resources, outward migration, and incidents of HIV/AIDS and human trafficking.

SUMMARY OF THE MULTITRANCHE FINANCING FACILITY—RURAL ROADS SECTOR II INVESTMENT PROGRAM

(as of January 2016)

Item	Project 1	Project 2	Project 3	Project 4	Project 5	MFF Total
Loan No.	2248-IND	2414-IND	2445-IND	2535-IND	2651-IND	
States	Assam, Orissa, and West Bengal	Orissa	Batch II in Assam and West Bengal	Assam, Orissa, and West Bengal	Chhattisgarh, Madhya Pradesh, Orissa, and West Bengal	
Road Length (km)						
Anticipated	3,144.00	1,200.00	1,670.00	3,111.62	4,708.44	**30,000.00**[a]
Actual/Revised	2,927.13	1,013.74	1,743.40	2,975.23		
Habilitations Impacted (no.)						
Anticipated	1,767	231	1,279	1,071		**19,000**
Actual	1,503	336	1,009	1,224		
Loan Amount						
Original	$180.00 million	$77.65 million	$130.00 million	$185.00 million	$222.20 million	**$750.00 million**
Actual/Revised	$173.90 million	$38.10 million	$121.73 million	$185.00 million	$222.20 million	**$746.20 million**
ADB Approval	31 July 2006	17 March 2008	26 September 2008	7 August 2009	6 July 2010	**20 December 2005**
Loan Agreement Signing	29 August 2006	28 March 2008	10 November 2008	3 September 2009	2 August 2010	
Loan Effective	18 October 2006	9 July 2008	5 January 2009	26 November 2009	29 October 2010	
Loan Closing						
Original	31 December 2008	31 December 2009	31 December 2010	30 June 2012	30 June 2013	
Extended	30 June 2009	31 December 2010	30 June 2013	31 December 2012	30 June 2014	

ADB = Asian Development Bank, km = kilometer, MFF = multitranche financing facility.
Note: The data for projects 1, 2, 3, and 4 are actual.
[a] Original expectation of the investment program. The total anticipated road length of the five projects was adjusted to 13,834 km.
Source: ADB website; ADB project completion review mission.

CORPORATE RESULTS FRAMEWORK INDICATORS

No.	Level 2 Result Framework Indicator	Target	Aggregate Output	Method and/or Comments
1.	Use of roads built or upgraded (average daily vehicle-km in the first full year of operation)	319,994 vehicle-km per day in 2014 (184,224 for Assam and 135,770 for West Bengal)	A total of 359,329 vehicle-km per day in 2014, (157,698 in Assam and 201,630 in West Bengal)	A traffic survey was conducted in February–March 2016, including the collection of the 2016 traffic data of the sample project roads. The 2014 traffic (first full opening year) was calculated according to the actual increase rates during 2008–2016.
2.	Roads built or upgraded—provincial, district, and rural roads (km)	A total of 1,670 km of rural roads constructed or upgraded	A total of 1,743.4 km rural roads constructed or upgraded under the project (900 km in Assam and 843.4 km in West Bengal)	The civil works included the construction or upgrading of rural roads to full single-lane cross-sections with a 3.5 m roadway and 7.5 m formation width with a bitumen surface, strengthening of existing culverts and bridges, construction of new bridges and cross-drainage structures, and provision of road furniture and safety facilities.

km = kilometer, m = meter.
Source: Asian Development Bank project completion review mission.