



# Completion Report

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Project Number: 37066-02  
Loan Number: 2414  
November 2012

## Multitranche Financing Facility India: Rural Roads Sector II Investment Program (Project 2) – State of Orissa

Asian Development Bank



## CURRENCY EQUIVALENTS

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

		<b>At Appraisal</b> (31 October 2005)	<b>At Project Completion</b> (31 December 2010)
Rs1.00	=	\$0.022	\$0.022
\$1.00	=	Rs44.995	Rs44.885

## ABBREVIATIONS

ADB	–	Asian Development Bank
CPF	–	community participation framework
CPS	–	country partnership strategy
EAf	–	environmental assessment and review framework
ECOP	–	environment code of practice
EIRR	–	economic internal rate of return
FFA	–	framework financing agreement
GDP	–	gross domestic product
IEE	–	initial environment examination
km	–	kilometer
M&E	–	monitoring and evaluation
MFF	–	multitranchise financing facility
MORD	–	Ministry of Rural Development
NRRDA	–	National Rural Roads Development Agency
OMMAS	–	Online Monitoring Management and Accounting Systems
PCR	–	project completion review
PFR	–	periodic financing request
PIC	–	project implementation consultant
PIU	–	project implementation unit
PMGSY	–	Prime Minister's Rural Roads Program
PPMS	–	project performance monitoring system
QCBS	–	quality- and cost-based selection
RRP	–	report and recommendation of the President
SRRDA	–	State Rural Roads Development Agency
TA	–	technical assistance
TSC	–	technical support consultant
VOC	–	vehicle operating cost

## NOTES

- (i) The fiscal year (FY) of the Government of India and the Orissa state government ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2010 ends on 31 March 2010.
- (ii) In this report, "\$" refers to U.S. dollars.

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## BASIC DATA

### A. Loan Identification

1.	Country	India
2.	Loan Numbers	Loan 2414-IND
3.	Project Title	Rural Roads Sector II Investment Program (Project 2) – State of Orissa
4.	Borrower	India
5.	Executing Agency	Ministry of Rural Development at the central government level; government of Orissa at the state level
6.	Amount of Loan	Original: \$77.65 million Revised: \$38.55 million
7.	Project Completion Report Number	IND 1360

### B. Loan Data

1.	Appraisal	
	– Date Started	1 August 2005
	– Date Completed	5 August 2005
2.	Loan Negotiations	
	– Date Started	11 March 2008
	– Date Completed	12 March 2008
3.	Date of Board Approval	17 March 2008
4.	Date of Loan Agreement	28 March 2008
5.	Date of Loan Effectiveness	
	– In Loan Agreement	90 days from the Loan Agreement
	– Actual	9 July 2008
	– Number of Extensions	
6.	Closing Date	
	– In Loan Agreement	31 December 2009
	– Actual	31 December 2010
	– Number of Extensions	2
7.	Terms of Loan	
	– Interest Rate	London interbank offered rate-based
	– Commitment Charges	0.15%
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
	– Front-end Fee	
8.	Terms of Relending (if any)	(Not applicable)
	– Interest Rate	
	– Maturity (number of years)	
	– Grace Period (number of years)	
	– Second-Step Borrower	

## 9. Disbursements

## a. Dates

<b>Initial Disbursement</b>	<b>Final Disbursement</b>	<b>Time Interval</b>
29 October 2008	7 April 2011	29 months

<b>Effective Date</b>	<b>Original Closing Date</b>	<b>Time Interval</b>
9 July 2008	31 December 2009	18 months

## b. Amount (\$)

<b>Category</b>	<b>Original Allocation</b>	<b>Last Revised Allocation</b>	<b>Amount Increased/ (Canceled)<sup>b</sup></b>	<b>Amount Disbursed</b>	<b>Undisbursed Balance<sup>c</sup></b>
1. Works	75,880,000	38,550,000	(37,330,000)	38,094,814	455,186
2. Consulting Services <sup>a</sup>	50,000		(50,000)		
3. Unallocated	1,720,000		(1,720,000)		
<b>Total</b>	<b>77,650,000</b>	<b>38,550,000</b>	<b>(39,100,000)</b>	<b>38,094,814</b>	<b>455,186</b>

( ) = negative

<sup>a</sup> The cost of the consulting services was financed by the government using its own funds.<sup>b</sup> During implementation, two partial loan cancellations were made, totaling \$39.1 million.<sup>c</sup> The undisbursed balance was automatically cancelled at loan account closing (7 April 2011).

## 10. 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)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Foreign Exchange Cost	46.80	29.83
Local Currency Cost	53.66	35.65
<b>Total</b>	<b>100.46</b>	<b>65.48</b>

## 2. Financing Plan (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Implementation Costs		
Borrower Financed	19.79	26.67
ADB Financed	77.65	38.10
<b>Total</b>	<b>97.44</b>	<b>64.77</b>
Financial Charges <sup>a</sup>		
Borrower Financed	3.02	0.71
ADB Financed	0.00	0.00
<b>Total</b>	<b>3.02</b>	<b>0.71</b>

<sup>a</sup> Including interest during construction and commitment fee.

ADB = Asian Development Bank.



## 3. Cost Breakdown by Project Component (\$ million)

Component	Appraisal Estimate	Actual
Road Connectivity Component	95.26	64.71
Capacity Building Component	0.15	0.05
Contingencies	2.03	0.00
Financial Charges	3.02	0.71
<b>Total (A+B)</b>	<b>100.46</b>	<b>65.48</b>

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Clearance of right of way	Before Q2 2006	Before Q2 2006
Procurement for civil work contracts*		Q4 2006–Q3 2007 Q4 2008–Q1 2009 <sup>a</sup>
Civil works	Q2 2007–Q2 2009	Q4 2006–Q4 2011 <sup>b</sup>
Consulting services	Q2 2007–Q2 2009	Q2 2007–Q2 2010 <sup>c</sup>

Q = quarter

<sup>a</sup> The 150 original subprojects were procured during Q4 2006–Q3 2007. The 30 additional subprojects were procured during Q4 2008–Q1 2009.<sup>b</sup> The civil works were substantially completed by loan closing in December 2010. The remaining works were completed by the end of 2011, using government financing.<sup>c</sup> The capacity building consultant started working on project 1 in April 2007 and continued to work on project 2 until March 2010. The project implementation consultant started in November 2007 and ended in May 2010.

## 5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
17 March 2008 — 30 June 2008	Satisfactory	Satisfactory
1 July 2008 — 31 December 2008	Satisfactory	Satisfactory
1 January 2009 — 30 June 2009	Satisfactory	Satisfactory
1 July 2009 — 31 December 2009	Satisfactory	Satisfactory
1 January 2010 — 30 June 2010	Satisfactory	Highly Satisfactory
1 July 2010 — 31 December 2010	Satisfactory	Satisfactory

**D. Data on Asian Development Bank Missions**

<b>Name of Mission</b>	<b>Date</b>	<b>No. of Persons</b>	<b>No. of Person-Days</b>	<b>Specialization of Members</b>
Fact Finding	18 April–6 May 2005	9	135	j, l, n(2), m, a, g, e(2)
Loan appraisal	1–5 August 2005	4	20	j, f, g, e(2)
Review on social safeguard and procurement*	8–16 and 24–26 April 2008	5	150	e, g(2), h, m
Review 1 <sup>a</sup>	7–14 May 2008	4	32	e(3), f
Inception <sup>a</sup>	10–18 November 2008	6	54	e(2), g, l, m, g
Review 2 <sup>a</sup>	27 July–26 August 2009	6	180	e(2), g(2), m, f
Review 3 <sup>a</sup>	14 November–2 December 2009	5	95	e, g(2), l, m
Review 4 <sup>a</sup>	2–20 December 2010	3	24	e(2), k
Completion review	13–20 August 2012			

a = country director, e = transport specialist, f = environment specialist, g = social / resettlement specialist, h = economist, j = counsel, k = control officer, l = project analyst, m = procurement, n = project implementation

<sup>a</sup> Combined with the missions for other projects under the investment program and technical assistance programs.

## I. PROJECT DESCRIPTION

1. To address the obstacle that lack of road connectivity posed to potential growth in rural India, in 2000 the Government of India established the Prime Minister's Rural Roads Program (PMGSY). The national program identified more than 170,000 habitations eligible under its criteria,<sup>1</sup> with improvement of about 738,000 kilometers (km) of rural roads,<sup>2</sup> at an estimated cost of about \$30 billion.<sup>3</sup> From 2006 to 2010, the estimated budget required for the PMGSY was \$11 billion, 40% of which would be funded by the government,<sup>4</sup> and 7% by committed assistance from the Asian Development Bank (ADB) and the World Bank; funding sources for the balance of 53% had not been identified. Following the first ADB loan,<sup>5</sup> further assistance for the PMGSY was requested by the government, using a new lending instrument—the multitranche financing facility (MFF).<sup>6</sup> Pursuant to the provisions of the framework financing agreement (FFA) for the Rural Roads Sector II Investment Program,<sup>7</sup> ADB approved the first loan of \$180 million in 2006 (project 1).<sup>8</sup>

2. Project 2 of the Rural Roads Sector II Investment Program is the second in a series of projects to be financed under the investment program. The loan of \$77.65 million for the project was negotiated on 12 March 2008 between the Government of India and ADB, and approved on 17 March 2008 by ADB. The loan and project agreements for the project were signed on 28 March 2008, and made effective on 9 July 2008.<sup>9</sup> The loan for the project would finance (i) improvement to about 1,200 km of rural roads in the state of Orissa,<sup>10</sup> and (ii) services of technical support consultants (TSCs) that might be required beyond the closing of project 1 (originally scheduled for 31 December 2008 and extended to 30 June 2009). The total cost for the project was estimated at \$100.46 million, 77.3% of which would be financed by an ADB loan, and 22.7% by government funding. The outcome of the project would be improved connectivity of rural communities to markets, district headquarters, and other centers of economic activity via the improved roads; this was expected to contribute to the reduction of poverty and deprivation, and economic growth of rural communities in the vicinity of the project roads. The project was expected to be completed by 30 June 2009.

## II. EVALUATION OF DESIGN AND IMPLEMENTATION

### A. Relevance of Design and Formulation

3. The PMGSY had developed into a well-defined program with clear goals and well-

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<sup>1</sup> A habitation is a unit used in the PMGSY. A habitation is a distinct cluster of population with houses that occupies an area and has a local name. In rural areas, a village (revenue village) may include one or more habitations.

<sup>2</sup> This is comprised of new construction of 370,000 km of rural roads and upgrading of 368,000 km of rural roads.

<sup>3</sup> Government of India. Ministry of Rural Development (RC Division). 2006. *PMGSY Briefing Book*. Delhi.

<sup>4</sup> This comes from a special excise duty (called cess) on high-speed diesel oil, which is about \$0.9 billion annually.

<sup>5</sup> ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Rural Roads Sector I Project*. Manila (Loan 2018-IND, approved on 20 November 2003.) The project was completed in June 2009.

<sup>6</sup> For the details of the MFF, see Appendix 12.

<sup>7</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranche Financing Facility for India for the Rural Roads Sector II Investment Program*. Manila. The framework financing agreement between India and ADB was signed on 25 November 2005.

<sup>8</sup> Project 1 (Loan 2248-IND) was approved on 31 July 2006, became effective on 18 October 2006, and closed on 30 June 2009. At completion, total 2,927.13 km of rural roads were constructed and/or upgraded under project 1.

<sup>9</sup> Loan agreement, Rural Roads Sector II Investment Program (Project 2), 28 March 2008

<sup>10</sup> The name Orissa was changed to Odisha on 1 November 2011 by the government of India. To be consistent with the report and recommendation of the President and the Project Administration Manual, the original name of Orissa is used throughout the report.

structured standard operating procedures based on an annual implementation cycle. The sustainability of the program was increased through capacity strengthening of state agencies in the areas of project planning and design, management oversight for construction activities, social and environmental safeguards, procurement and contract management, and fiduciary arrangements. This made the project implementation approach more appropriate, compared to the arrangements for the Rural Roads Sector I Project (footnote 5).

4. In line with the government's priorities of supporting economic growth, including both high growth and equitable pro-poor growth, ADB's assistance to India aimed to support infrastructure-led poverty reduction. The investment program strategically focused on assisting the poor by providing connectivity and was designed to fund other states in meeting the investment program requirements. Under project 1, a total of 2,927.13 km of rural roads were constructed and/or upgraded, which significantly improved connectivity in the project area, brought remarkable socioeconomic impacts, and directly benefited about 4 million people.<sup>11</sup> Consulting services were used to assist in successful implementation and capacity building related to rural road development and maintenance. The project continued to focus on assisting the poor by providing road connectivity in the state of Orissa, which had a large rural population and lacked all-weather road coverage. The poverty head count rate in the state of Orissa was one of the highest in India.

5. During and after implementation, the project was deemed highly relevant to the government's objectives and policies, as well as ADB's country strategy. At completion, 1,013.74 km of rural roads were constructed and/or upgraded, which significantly improved connectivity in the project area (para. 6), brought remarkable socioeconomic impacts, and directly benefited about 315,600 people (paras. 36–37).<sup>12</sup> Consulting services were used to assist in capacity building of the rural road development. As with project 1, project implementation consultants (PICs) were used (para 18). Despite some changes in the project scope and a longer implementation period (paras. 6 and 12), the project scope was generally within the original design and the project objectives anticipated at appraisal were substantially achieved. The outputs and outcomes of the project met the government's objectives and ADB's country strategy. The design and monitoring framework of the project with results is in Appendix 1.

## **B. Project Outputs**

6. At appraisal, it was anticipated that a total of 1,200 km of rural roads in the state of Orissa would be constructed or upgraded under the project. 150 subprojects were selected following the selection criteria in the FFA. In October 2008, 62 fast-moving subprojects were shifted from project 2 to project 1 to expedite progress on the latter, and solve the issue of retroactive financing for the project.<sup>13</sup> At that time 88 subprojects (756.46 km) were left in project 2 for further implementation.<sup>14</sup> During implementation, 30 new subprojects (257.26 km) were

<sup>11</sup> ADB. 2012. *Project Completion Report, Multitranchise Financing Facility, India: Rural Road Sector II Investment Program (Project 1)*. Manila.

<sup>12</sup> About 155,590 (49%) female, and 160,010 (51%) male.

<sup>13</sup> During the tripartite project review meeting on 21–22 July 2008, it was decided that slow-moving project 1 contracts could be replaced by project 2 contracts that had achieved > 85% progress. The switching of packages from project 1 to project 2 was done to expedite progress and also resolve claims of some of the disbursement that could not be made due to retrospective financing limits. Accordingly 62 packages of the project were proposed to be shifted to project 1.

<sup>14</sup> ADB MOU, *Loan 2414-IND: Rural Roads Sector II Investment Program – Project 2 – Major Change in Project Scope*, 28 October 2008.

added to the project.<sup>15</sup> At completion, 118 subprojects with a total length of 1013.72 km were constructed or upgraded under the project. The civil works included construction and upgrading of rural roads to a full single-lane cross section, 3.5 meter carriageway and 7.5 meter formation width; strengthening of the culverts and bridges; construction of new bridges and cross drainage structures; and provision of road furniture and safety facilities. Concrete pavement was provided at the village sections. The 118 subprojects included a total of 238 sections of the rural roads in 17 districts of Orissa, which connected 336 habitations and benefited about 315,600 people in the project area. The project output by districts is in Appendix 2.

7. As required in the contract, quality control of civil works was implemented by the contractors with supervision from the district project implementation units (PIUs). The national and state quality monitors inspected the subproject roads regularly, in addition to in-house construction supervision. No serious quality problems were reported during the contract defect liability period.<sup>16</sup> ADB's project completion review (PCR) mission observed that (i) the completed roads were of good quality; (ii) the road surface roughness was within the international roughness index for a comfortable ride; (iii) some safety and environment protection facilities were installed on the subproject roads; (iv) routine maintenance of the project roads was in place; (v) the communities were fully consulted, using the community participation framework prior to road construction; and (vi) consultants responsible for training and monitoring the environmental and social safeguard aspect of the project performed satisfactory.

### **C. Project Costs**

8. At appraisal, the total project cost was estimated at \$100.46 million, including contingency costs. During implementation, the project scope was changed by shifting 62 subprojects to project 1 and adding 30 new subprojects, which resulted in a reduction in total road length from 1,200 km to 1,013.74 km. The actual total project cost was about 34.8% lower than the appraisal estimate. The unit cost per km for the road connectivity component decreased by 19.6%, mainly due to lower contract prices and a decrease in construction quantity (para 19). The capacity building program budget was partially used, as anticipated at appraisal, and \$0.05 million was added for the project implementation consultant (PIC). The total finance charges for the ADB loan, including interest during construction and commitment charges, decreased from \$3.02 million to \$0.71 million due to a lower interest rate. Upon completion, the total actual project cost was Rs2,938.93 million, or about \$65.48 million equivalent.<sup>17</sup> Appendix 3 compares the project cost at appraisal and completion in detail.

9. Under the financing plan envisaged at appraisal, the project would be financed by an ADB loan of \$77.65 million (77.3% of the total project cost) and government funding of \$22.81 million (22.7%). The ADB loan was from ADB's ordinary capital resources under ADB's London interbank offered rate-based lending facility with a 25-year term, including a grace period of 5 years and a commitment charge of 0.15%. The government funding was from the central government, through the Ministry of Rural Development (MORD), to the state government on a grant basis. As a result of the project scope changes and partial cancelation of the ADB loan during project implementation, the actual project financing amounts were also revised. At completion, the ADB loan of \$38.10 million represented 58.2% of the total cost, and the government's share of \$27.38 equivalent 41.8%, including the funding provided by the

<sup>15</sup> Four subprojects were from project 1 and 26 subprojects were from other subprojects originally prepared for Project 2.

<sup>16</sup> The period extends for 5 years after completion of civil works.

<sup>17</sup> The total project cost for the road connectivity component was converted from Indian rupees to US dollars using the exchange rate at project completion.

government after the ADB loan closing. The costs for consulting services (for both TSCs and the PIC), were fully financed by the government using its own funds. A detailed comparison of the financing plan at appraisal and completion is in Appendix 3.

#### **D. Disbursements**

10. Under the investment program, the second periodic financing request for \$77.65 million was received on 28 November 2007 by ADB. ADB reviewed the submitted documents and approved the loan on 17 March 2008; loan signing was on 28 March 2008, and the loan became effective on 9 July 2008. The project used advance contracting and retroactive financing (as was the case for project 1). In April 2008, the ADB mission found that the expenditures incurred for the subprojects under the loan exceeded the ceiling for retroactive financing, mainly because of the very fast implementation pace of the subprojects, and the last-minute decrease in the requested loan amount. On the other hand, project 1 needed more subprojects to use its loan proceeds (footnote 11, para 12). To address this issue, 62 subprojects under the project, which were being rapidly implemented and were more than 85% completed, were shifted to project 1, and 30 new subprojects were added to the project (footnote 13). The loan agreement was modified in accordance with these changes.<sup>18</sup> Following the project scope change, the first loan disbursement of \$0.77 million was made in October 2008. A total of \$16.67 million was disbursed through the end of the 2008, equaling disbursement of about 21% of the total loan amount after 4 months of loan effectiveness. Since the contracts for the 30 new subprojects were only awarded in January 2009, the project was unlikely to be completed before the original loan closing date of 31 December 2009; ADB thus extended loan closing to 30 June 2010.<sup>19</sup> Project implementation slowed in 2010 for reasons beyond the project's control (para. 12). The state government estimated that it would not be able to fully disburse the loan and requested another extension of the loan closing date. The request was sent on 14 June 2010 and ADB approved the second loan extension (of 6 months, to 31 December 2010).<sup>20</sup> The loan was closed on 31 December 2010 and the loan account was closed on 7 April 2011, with the last disbursement of loan proceeds on that day.<sup>21</sup>

11. During implementation, it was found that about \$39.10 million of loan proceeds were left uncommitted due to changes in the project scope and depreciation of the Indian rupee. Based on discussions between ADB and the project executing agency, it was decided to proceed with a two-phase partial loan cancellation. The first cancellation of \$24.1 million (all uncommitted loan proceeds) was made effective on 30 April 2009.<sup>22</sup> The second cancellation of \$15.0 million was made on 13 January 2010.<sup>23</sup> The total loan amount was revised to \$38.55 million. The cancelled amounts replenished the overall investment program by an equivalent amount. At the loan account closing on 7 April 2011, the total loan proceed disbursed was \$38.10 million. The balance of \$0.46 million was cancelled on the same day (footnote 21). The partial cancellations of the ADB loan had no negative impact on the project as the government provided all required project funds from its own resources. The annual projected and actual disbursement of loan

<sup>18</sup> ADB letter to Ms. Anuradha Thakur, Director of ADB-I, Department of Economic Affairs, Ministry of Finance, India.

<sup>19</sup> ADB fax, *Loan 2414-IND: Rural Roads Sector II Investment Project – Project 2 – Extension of Loan Closing Date*, 13 November 2009

<sup>20</sup> ADB fax, *Loan 2414-IND: Rural Roads Sector II Investment Project – Project 2 – Extension of Loan Closing Date*, 7 July 2010

<sup>21</sup> ADB fax, *Loan 2414-IND: Rural Roads Sector II Investment Program – Project 2 – Cancellation of Unutilized Loan Balance*, SATC, 12 May 2011

<sup>22</sup> ADB fax, *Loan 2414-IND: Rural Roads Sector II Investment Project (Project 2) – Approval of Partial Cancellation of Loan*, 3 June 2009.

<sup>23</sup> ADB fax, *Loan 2414-IND: Rural Roads Sector II Investment Project (Project 2) – Approval of Partial Cancellation of Loan*, 26 January 2010

proceeds is in Appendix 4.

## E. Project Schedule

12. At appraisal, it was anticipated that the project would be implemented over 2 years and be completed by 30 June 2009. Under the retroactive financing provision of the FFA, contracts for subprojects under the project were awarded before August 2007. However, the loan was approved in March 2008 and became effective in July 2008. At that time, the rapid progress of expenditure exceeded the retroactive financing ceiling. Due to this limitation, 62 subprojects that were being rapidly implemented were removed from the project and shifted to project 1 in October 2008; in addition, 30 new subprojects (4 from batch I and 26 from batch II) were added to the scope of the project. The contracts for the 30 new subprojects were awarded in January 2009 and were expected to be completed in June 2010.<sup>24</sup> As a result of these changes, ADB extended the loan closing to 30 June 2010. However, Orissa experienced persistent heavy rain during May–September 2010, as well as cyclone Laila, which impacted the construction period. There were also activities conducted by *naxal* in the districts of Rayagada, Dhenkanal, Nabarangpur and Sambalpur.<sup>25</sup> These events all served to slow project progress. Following the tripartite project review meeting on 18 June 2010, the government requested and ADB approved a second 6-month extension of the loan closing date. As a result of efforts by the government, PIUs and ADB, the civil works for all subprojects were substantially completed by the end of 2010. The minor remaining works were completed by the end of 2011 with government financing. As per the contract, the contractors were responsible for the defect liability period of 5 years after civil works completion. The actual project implementation schedule is in Appendix 5 and a chronology of major events is in Appendix 6.

13. The original contract for the TSC was signed in April 2007 for project 1, and extended for the project (with adjusted terms of reference), with an end date of 30 June 2009.<sup>26</sup> Due to the extension of project implementation, the TSC contract was also extended, until 31 March 2010. The PIC, which monitored the environment and social safeguard aspects of the project during implementation, served from 15 November 2007 to 14 May 2010.<sup>27</sup>

## F. Implementation Arrangements

14. As arranged for the PMGSY program, the executing agencies for the project were MORD at the central level and the government of Orissa at the state level. MORD, with technical and management support from National Rural Roads Development Agency (NRRDA), continued to be responsible for overall project supervision and execution of the PMGSY program. The state government, through the Rural Development Department, was responsible for executing the project at the state level. During implementation, a coordination committee, chaired by the MORD joint secretary and comprised of representatives from relevant agencies, was established at the central level to monitor the use of the loan and overall implementation performance. A similar committee was also established at the state level under PMGSY guidelines to monitor timely implementation of the project.<sup>28</sup> In Orissa, the project implementation agency was the Orissa State Rural Roads Agency. Of the state's 30 districts, 17 were involved in the project, and were to execute the subprojects in their corresponding districts.

<sup>24</sup> The normal period for completing a subproject is 12–15 months.

<sup>25</sup> *Naxal* refers to militant communist groups that operate in India.

<sup>26</sup> The TSC was Operations Research Group.

<sup>27</sup> The PIC was MSV International.

<sup>28</sup> Ministry of Rural Development, Government of India. 2004. *PMGSY Programme Guidelines*. <http://pmgsy.nic.in/pmg31.asp>

One or two project implementation units (PIUs) were established in each district, which were headed by chief executive officers responsible for overall coordination of project implementation in its district, including planning, contractor selection, contract management, procurement, and construction supervision. The number of staff in a PIU varied from 25 to 50 depending on the workload. After project completion, the PIUs were responsible for managing road maintenance, including road condition inspection, contractor procurement, financial management, and coordination with local governments.

15. The major responsibilities of the TSC were to (i) check detailed project reports, conduct random checks of roads under construction, and provide technical support to the PIUs to ensure that road safety measures were properly incorporated; (ii) check compliance of the subprojects with provisions of the community participation framework (CPF), environmental assessment and review framework (EAF) and/or environment code of practice (ECOP); and (iii) conduct socioeconomic impact monitoring. During implementation, the TSC provided training to the PIUs on tasks originally assigned to the PIC.<sup>29</sup> The PIC was recruited to carry out the monitoring on environment and social safeguard aspects. The institutional framework for the project implementation is in Appendix 7.

## **G. Conditions and Covenants**

16. Project implementation complied with most of the loan conditions and covenants, including subproject selection, procurement and contract management, financial management, environment and social safeguards, and road safety and maintenance. A completed institutional framework for implementing the PMGSY was well established and functional. The executing and implementing agencies at both the central and state levels implemented the project efficiently, with due diligence and in accordance with the PMGSY guidelines. All of the loan covenants concerning the environment and social safeguards were complied with. The required project progress reports were submitted to ADB on time. The financial accounts and statements were audited annually by chartered accountants and the audited financial reports were submitted to ADB.

17. The loan covenants also required the project roads to be properly maintained, supported by sufficient funds. During implementation, the civil works contracts had a provision for 5 years of post-construction maintenance by the contractors, as per the PMGSY guidelines. Currently, the Orissa State Rural Roads Agency is responsible for the road maintenance following the first 5-year contractor liability period. As requested in the PMGSY guidelines, the state governments are taking steps to build capacity in the designated *zilla panchayats* (district governments), and the PIUs should continue to be responsible for maintenance until the *zilla panchayats* take over road maintenance functions. The *zilla panchayats* in the project states participate in maintenance planning and provide comments on prioritization of maintenance activities and projects. Compliance with key project loan covenants is summarized in Appendix 8.

## **H. Consultant Recruitment and Procurement**

18. The recruitment of the consultants was in compliance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). A national consulting firm was originally engaged as the TSC by the NRRDA for project 1 based on quality and cost-based selection. The contract with the TSC was signed in April 2007 for Rs15.7 million, for a period of 72 person-

<sup>29</sup> Under project 1, three PICs were recruited to assist the three project states in engineering aspects, but the PIUs were found to be capable of carrying out the engineering tasks themselves with the help of the TSC.



months. In light of its satisfactory performance, the services of the TSC were continued for the project on a single source selection basis approved by ADB, but with a smaller contract amount. The TSC terms of reference for the project were adjusted as necessary. As a result of the extended implementation period, the service period of the TSC was extended to 31 March 2010. A PIC, which was responsible for monitoring of the environment and social safeguard aspects of the project, was recruited (using quality and cost-based selection) on 31 October 2007.

19. The procurement for civil work contracts conformed to ADB's *Procurement Guidelines* (2007, as amended from time to time). At appraisal, it was planned that contracts for goods estimated to exceed \$1.0 million and contracts for works estimated to exceed \$10.0 million would be procured using international competitive bidding procedures. Contracts for goods and works with an estimated value below the international competitive bidding thresholds, but above \$100,000, would be procured using national competitive bidding procedures. In practice all civil work contracts were procured using national competitive bidding, as all were valued under \$10.0 million. Under the advance contracting and retroactive financing provisions of the FFA, Orissa started procurement action as early as October 2006. The first contract award under the project was in December 2006. All the civil works contracts under the original 150 subprojects were awarded by August 2007. The procurement of civil works also followed the PMGSY standard bidding documents and procedures with agreed ADB financing-specific adjustments in the areas of eligibility, anticorruption, and social and environmental safeguards under the project. An ADB-engaged procurement consultant carried out post-facto review of the procurement process and documentation, and confirmed that there was no departure from the procurement arrangements.<sup>30</sup> After loan effectiveness, it was found that the fast pace of expenditures exceeded the ceiling for retroactive financing. Therefore, 62 subprojects were removed from the project and 30 new subprojects added. The contracts for the new subprojects were awarded in January 2009 following the same procurement procedure and guidelines. At completion, a total of 118 subprojects with a total length of 1,013 km were implemented, which were located in 17 districts of Orissa state. During implementation, the work quantities were carefully measured according to actual engineering requirements and alignment permits. As a result, the actual work quantities for most civil work contracts were reduced, which saved about 10% of the project funds. The project contract packages with actual costs are summarized in Appendix 9.

## I. Performance of Consultants and Contractors

20. The performance of the TSC with respect to scope of services assigned was *highly satisfactory* and the quality of reporting was acceptable. As anticipated at appraisal, TSC was engaged by NRRDA to support Orissa State Rural Roads Agency in implementing the project. The scope of the TSC service for the project was adjusted according to the requirements of the project, adding the preparation of project 3 in Assam, Orissa and West Bengal and new subprojects in Madhya Pradesh and Chhattisgarh, as well as conducting residual impact monitoring in Madhya Pradesh and Chhattisgarh. The TSC deployed a team of experts which was comprised of social development experts, environment specialists, and road safety experts. The TSC checked the compliance of the project subprojects with reference to CPF and EAF and ECOP provisions. The TSC also provided technical support to the PIUs to implement a road safety awareness program and conducted road safety workshops in Orissa. The TSC also provided training to the PIUs and the contractors in complying with social and environment safeguard requirements. The performance of the PIC was *satisfactory*. Although the activities for preparation of designs for the roads under the project started in June 2006, the PIC was

<sup>30</sup> ADB. 2009. *Technical Assistance to India for Capacity Development to Enhance Project Readiness and Results Monitoring for Transport Projects*. Manila.

mobilized in October 2007. At the design stage the PIUs were involved in carrying out the social and environmental screening activities, identifying impacts and mitigation measures, conducting community consultations, and preparing the CPF documents and environmental checklists in accordance with the approved community participation framework and the ECOP for the project. During implementation, the PIC carried out the monitoring of the social and environmental safeguards for all the roads under the project.

21. The overall performance of the contractors was *satisfactory*. The performance of most contractors with respect to deployment of personnel, supervision, checking work quality, and project field inspections was satisfactory. It was observed that contractor personnel were self-motivated, dedicated and results-oriented and understood the project requirements. The capacity of the contractors was enhanced through frequent contract management workshops. However, seven civil work packages were terminated during implementation with a total contract price of Rs 274.1 million, which was mainly due to unsatisfactory performance, unavailability of key staff, or *naxal* insurgency in some districts where contractors were reluctant to work. The pending works were implemented by the existing contractors, with satisfactory performance.

#### **J. Performance of the Borrower and the Executing Agency**

22. The performance of the Borrower (India) and the executing agencies (MORD at the central level and the government of Orissa at the state level) was *highly satisfactory*. Organizational arrangements were established that enabled efficient and timely management of project implementation. The central government provided the required counterpart funds and all necessary support in a timely manner. To ensure project success, the executing agencies provided close and regular monitoring and coordination of the construction progress and quality control. The executing agencies, with assistance from the consultants, prepared the required periodic project progress reports. Chartered accountants audited the financial accounts and statements and indicated that the ADB loan proceeds were used properly. ADB significantly improved the capacity of the executing and implementing agencies through the investment program and other capacity building programs. The executing and implementing agencies also facilitated ADB review missions for the investment program, including the project.

#### **K. Performance of the Asian Development Bank**

23. 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 implementation. ADB conducted six project review missions,<sup>31</sup> during which it carried out substantial project site visits to a number of subprojects, checked the project physical progress, reviewed compliance with social and environmental safeguards, and provided advice on various aspects of the project implementation. Considering the satisfactory implementation progress, ADB waived the midterm review. In addition, ADB conducted regular procurement and disbursement audits and provided substantial assistance for consultant recruitment, implementation progress, and loan disbursement. The executing and implementing agencies recognized the role of the ADB missions in advising on matters relating to technical issues and contract administration.

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<sup>31</sup> Some of the ADB review missions were combined with the reviews of other loans under the investment program and related technical assistance programs; see Basic Data for mission details.

### III. EVALUATION OF PERFORMANCE

#### A. Relevance

24. The project is considered *highly relevant* to the government's strategy of economic growth and poverty reduction through development of rural access roads. Through the end of June 2012, 357,286.29 km of rural roads had been improved under the PMGSY, and 93,115.29 km were under construction. Being part of the PMGSY, the project was highly relevant to the government's 10th Five-Year Plan 2002–2007 and succeeding plans.<sup>32</sup> ADB's India Country Partnership Strategy (CPS) 2009–2012 has been designed to support the government's efforts in addressing some of the binding constraints identified in the 11th Five-Year Plan (2007–2012) and supporting the government's efforts to facilitate inclusive growth.<sup>33</sup> The outputs and outcomes of the project were important, timely and effective for implementation of the PMGSY.

#### B. Effectiveness in Achieving Outcome

25. The project is rated *highly effective* in achieving its outcome. At appraisal, the state of Orissa had a large rural population, with the majority of people dependant on agriculture for their livelihoods. Poverty was particularly acute in the rural areas, with large numbers of people living below the poverty line. Before the project, most of the project roads were not paved; some sections were not passable during rainy season, and the average vehicle speed was only 25 km per hour. At completion, 1,013 km of all-weather rural roads had been constructed and/or upgraded under the project, which connected 336 habitations and benefited about 315,600 people in 17 districts of Orissa state. In conjunction with state road development in the project area, implementation of the project has significantly improved rural habitation connectivity, and access to markets, health and education facilities in the project area by providing all-weather roads, and reducing transport costs and passenger travel time. The vehicle travel speed has increased to 40–50 km per hour on the improved roads, significantly reducing travel time and transport cost. It has also stimulated the transport services in the rural areas. Supplemented with rural socioeconomic development, the improved roads will bring huge benefits to the local residents, especially the poor. In the project area, a comprehensive rural road network is being completed with national and state highways and rural roads, which will substantially boost the local transport service development and bring significant socioeconomic benefits to the local residents. It was estimated that a substantial proportion of the vehicle operating cost savings will be realized by road users following rural road improvement, and road transport safety will be substantially improved by the road safety measures designed under the project.

#### C. Efficiency in Achieving Outcome and Output

26. The implementation of the project is rated *efficient*, considering the robust traffic development and the results of the economic re-evaluation, despite the longer project implementation period and reduced project scope. The TSC carried out traffic surveys on selected sample roads in the project area in June 2008 and January 2009. It was found that motorized vehicle traffic had significantly increased (from 54.24% of total traffic in 2008 to 58.45% in 2009). In July 2012, a due diligence supplementary traffic survey was designed and implemented in the project area during the project PCR mission.<sup>34</sup> Based on the existing traffic,

<sup>32</sup> Eleventh Five-Year Plan (2007–2012) (<http://planningcommission.nic.in/plans/planrel/11thf.htm>), and Ministry of Rural Development, Government of India. 2007. *Rural Road Development Plan: Vision 2025*. New Delhi.

<sup>33</sup> ADB. 2009. *India Country Partnership Strategy 2009–2012: Abridged Version*. Manila

<sup>34</sup> To validate previous traffic surveys and obtain the latest data, a due diligence traffic survey was designed and implemented during the project PCR mission. A consultant team was recruited to carry out 24-hour traffic count

and the traffic development trend, the traffic forecast at appraisal was revised in light of more rapid socioeconomic development, the improved road networks, and the rapid increase in motorized vehicle registration in the project area. It was estimated that traffic on the project roads will increase annually by an average of 9%–11% during 2013–2017, and by 7%–9% beginning in 2018. The rates of increase in motorized traffic are much higher than those anticipated at appraisal, reflecting faster socioeconomic development in the project area.

27. To better measure the project's efficiency, the PCR mission undertook an economic re-evaluation by recalculating the economic internal rate of return (EIRR), using a similar methodology as that employed at appraisal, but with updated data. The economic re-evaluation compared the economic costs and benefits for the with- and without-project cases. The economic benefits considered in the re-evaluation include (i) vehicle operating cost (VOC) savings, (ii) passenger time cost savings, and (iii) other potential benefits. The recalculated EIRR was 21.5%, compared with 18.0% EIRR at appraisal.<sup>35</sup> The higher EIRR resulted mainly from a lower unit cost for the road connectivity component and higher traffic than estimated at appraisal. The recalculated EIRRs are above the ADB-recommended social discount rate of 12% and the project can therefore be considered to be economically viable. The EIRRs were subjected to a sensitivity analysis to test different scenarios. The results of the analysis showed that the project continued to be economically viable for all scenarios; a combination of a 20% maintenance cost increase and a 20% benefit reduction resulted in a decrease in the project EIRR to 18.3%. The sensitivity test showed that the EIRR is more sensitive to changes in benefits than cost increases, indicating the government should prioritize socioeconomic development in the project area and implement policies to stimulate transport services and increase incomes of villagers, which may help maximize the benefits of the project. The summary of the economic re-evaluation is in Appendix 10.

#### **D. Preliminary Assessment of Sustainability**

28. The project is rated *most likely to be sustainable*. The continuous implementation of the PMGSY with external assistance from development partners has ensured the sustainability of rural road development and poverty reduction in India. The project is the second loan under the Rural Roads Sector II Investment Program. Considering the successful implementation of the projects under the investment program, ADB has approved a new investment program to continuously support implementation of the PMGSY.<sup>36</sup> ADB has also designed and financed many socioeconomic development projects in the project area in the fields of economic growth, state road improvement, power and energy development, and poverty reduction. The NRRDA was conceived as a compact, professional, and multidisciplinary body to provide the requisite technical and management support to the MORD and the state governments to effectively implement the programs. Under the program, the state governments are responsible for planning, implementation, and maintenance. For better management of PMGSY projects, several computer-based systems—including a road planning and maintenance system, e-tendering and procurement system, and centralized online monitoring management and accounting systems—have been adopted and used by the executing agencies, implementation agencies, and regional PIUs.

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surveys on 35 selected project roads (30 project roads and 5 control roads).

<sup>35</sup> In the MFF, the overall EIRR for the sample subprojects was 18.0% (15.6% for Assam, 18.0% for Orissa, and 20.1% for West Bengal).

<sup>36</sup> ADB. 2012. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility, Technical Assistance, and Administration of Technical Assistance to India for the Rural Connectivity Investment Program*. Manila (\$800 million, approved on 12 July 2012).

29. The government makes utmost efforts in the rural road maintenance, especially in government budget allocation and capacity building. There is a clear arrangement between the PIUs and the central government on long-term road maintenance, i.e., the PIUs are responsible for the maintenance while the central government allocates required budget according to national norm. To properly maintain the roads created under the PMGSY, the civil works contracts required contractors to provide 5 years of post-construction maintenance. According to the latest arrangement, the SRRDA in Orissa is responsible for road maintenance after the first 5-year contractor liability period. However, *zilla panchayats* still participate in maintenance planning and provide comments on prioritizing maintenance activities and projects. The government budget for the PMGSY has increased, with the allotment for routine maintenance increasing from Rs17.5 million in 2005–2006 to Rs400.0 million in 2012–2013. The PCR mission noticed during site visits that the roads created under the project were well maintained, and that funds and capacity for road maintenance were sufficient.

30. However, special attention should be paid to the following issues to ensure continued project sustainability:

31. **Road maintenance.** The number of rural roads that have and will be constructed and/or upgraded through the PMGSY is increasing, while institutional capacity remains unchanged. Attention and effort should also be given to the operation and maintenance of the road network. The capacity of the road agencies, training of engineers, and implementation of an effective network management system and supply chain should be considered. The PIUs should also enhance inspection of road conditions and develop maintenance plans, with special attention to the joints between cement and asphalt sections to avoid serious damage and interruption during the rainy season. Design of rural road projects, maintenance activities, and supervision should be enhanced. In particular, the discrepancy between the extent of the rural road network (80% of the total road network in India) and the availability of skilled civil engineers, technicians, and site supervisors should be minimized through training.

32. **Road safety.** Provision of road furniture and safety measures should be improved, with consideration given to pedestrians and bicyclists in road design; specifications and standards for road safety facilities should be studied and developed, and sufficient funding provided. Road safety audits should be done systematically on a sample of road designs, both during construction and on existing roads, and recurrent safety issues addressed on all roads. On some project road sections, local villagers have set up random speed breaks of varying size and from various materials. Consistent criteria should be established in consultation with communities for setting these up and authorizing their installation. In the meantime, road safety campaigns should be conducted for all road users, including drivers, villagers and students.

33. **Rural socioeconomic development.** The improvement of the roads has effectively increased the connectivity and mobility of the local villagers, but promoting rural socioeconomic activities and poverty reduction are the ultimate objectives of the investment program. The project area remains agriculturally based and underdeveloped. Economic activities, especially industrial and market development, and social service development (including education, medical care, and cultural facilities) remain very basic. The governments should formulate and implement proper policies to stimulate rural socioeconomic development, which may also generate more traffic and make full use of the project roads.

## **E. Impact**

34. **Environmental safeguards.** The investment program was categorized as an

environment category B project 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. The government does not require an environmental assessment for this investment program and its subprojects. However, an initial environmental examination (IEE) of sample subprojects was prepared as part of the detailed project reports. The environmental examination found no adverse environmental impact associated with the location of the rural roads. Of the total 322 km of sample rural road construction works in 48 different stretches, none pass through national parks or wildlife sanctuaries. No archaeological, historical, or protected heritage monuments; natural habitats or nature reserves; or reserve, protected, or unclassified forest areas are situated within 5 km of the subproject roads. The assessment also indicated that (i) the environmental impacts would occur only during construction, and be temporary and reversible; and (ii) mitigation measures could be easily incorporated into road design and construction. The EAF and ECOP were prepared for the entire investment program. During implementation, the governments and the PIUs with the assistance of the TSC carefully implemented the environment mitigation measures and the PIC carried out regular environment monitoring. The ADB project review missions noted that the project state had incorporated the standard environmental management plan in their bidding document for civil works. The contractors' bill of quantities included costs for environmental mitigation measures. Adequate drainage measures were incorporated in the project design and constructed to ensure that the drainage was efficient and waterlogging did not occur. The ADB review missions found no adverse environmental impacts associated with the project.

**35. Land acquisition and social safeguards.** During formulation of the investment program, a social assessment and survey of sample households was conducted, which focused on the project impacts to poverty reduction, gender, land availability, and indigenous peoples. The assessment 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 (for shoulder adjustment and drainage construction) was required. No relocation was required for minor realignments. The CPF—which draws on experience from the previous projects, and harmonizes with the World Bank-financed rural roads project in other states—was agreed upon between the government and ADB and designed to provide guidance and mitigation measures for voluntary land donation, and to ensure proper community participation during implementation. During the ADB mission for the investment program in 2007, the field visit and a randomly selected review of CPF documentation revealed that (i) people agreed to voluntarily contribute their land for the road construction, which was confirmed through verbal and written records and verified by *gram panchayats*; (ii) there was full consultation with landowners and non-titled people regarding site selection; (iii) grievance redress mechanisms were in place at the village level; and (iv) proper attempts had been made toward full implementation of CPFs. During implementation, the PIUs ensured that the road selection criteria, the process for community participation,<sup>37</sup> and their documentation complied with the CPF principles and procedures. The adverse social impacts were mitigated by design modifications and the selection of alternative alignments. The voluntary land donation system was used in cases where extra private land had to be acquired for specific subprojects. In a very few cases, revenue land was provided to vulnerable affected persons as replacement land through an extensive legal procedure, with support from the PIUs.

**36. Socioeconomic impact.** The PMGSY program is quickly bringing about a socioeconomic transformation in rural India. A multiyear study was undertaken to gauge the

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<sup>37</sup> On average, 20% of participants in transact walk were women. .

socioeconomic impacts of the investment program. Six surveys monitored a sample of 9% of all habitations that were connected by the subprojects in three states of Orissa, West Bengal, and Assam. In the second quarter of 2011, ADB fielded missions to the three states to validate the data collected during the study, as well as to gather anecdotal information that would deepen the analysis of the data. Focus group discussions were held in eight sample habitations and eight control habitations in the three states with a cross-section of the community represented, including women and youth

37. The socioeconomic impact study<sup>38</sup> and the ADB missions found that the presence of all-weather roads has directly or indirectly contributed to improvements in connectivity, transportation, government services, livelihood, commerce, education, health, land value, infrastructure, social interactions, and gender empowerment. The survey and assessment revealed that (i) the average distance to the workplace increased by about 1 km, whereas the average time taken to reach the workplace decreased by 0.75 hours; (ii) public transport developed rapidly, with a large increase in the number of motorcycles in the habitations; (iii) livelihoods in the project area improved significantly, with per capita spending increasing by as much as 30%; (iv) implementation of the project used a large amount of local labor, totaling 219,956 person-months, and including 184,142 person-month of unskilled and 35,814 person-month of skilled labor; (v) the percentage of inhabitants employed outside of villages increased by 1%, the number of days of employment per year increased by 10 days over the 6 month period following road construction, and the number of inhabitants participating in agriculture, trade and business-related employment each increased by 1%; (vi) the mobility of women was stimulated as they could now travel alone in buses and on bicycles to and from nearby towns and cities; (vii) the roads have allowed 25% more farmers to visit *haats* (nearby markets) regularly; (viii) the proportion of inhabitants who had completed grade 12 and above increased by 3%, as did the proportion completing grades 10–12, while the proportion who had completed grades 5–10 increased by 4%; there was a decrease of 6% in uneducated inhabitants; and (ix) the frequency of visiting a clinic or hospital increased by 4% for those visiting at least once a month. Nearly 100% of all births are taking place in government health care facilities. However, reduced poverty levels in the project areas cannot be fully attributed to the project, as rural roads serve as a conduit for products and services to reach the habitations as well as allowing products and services produced in the habitations to reach markets. The survey and assessment concluded that the connectivity has impacted rural living conditions by giving communities more reliable and rapid access to outside products, services, information, and social links, and by allowing external service and product providers and social contacts to have improved access to rural communities. The roads have acted as a catalyst for sustained improvements in living conditions and will be a conduit for continued rural development. A summary of the socioeconomic impacts is in Appendix 11.

#### IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

##### A. Overall Assessment

38. Overall, the project is rated *highly successful*. The project was highly relevant to the government's overall development objectives and ADB's country partnership strategy. The

<sup>38</sup> The survey in the six districts covered 15 sample habitations on the project roads and five control habitations on the control roads; 50 households were selected randomly, and about 292 people were interviewed. Of these, 157 (54%) were male, and 135 were female (46%).

completed rural roads have effectively improved connectivity in the project area and significantly supported rural socioeconomic development. The implementation of the project has realized its main objectives of supporting the implementation of the PMGSY. The economic re-evaluation shows the robust economic viability of the project. The project impact study concluded that the project has brought remarkable socioeconomic benefits to local villagers along the project roads, especially the poor. The objectives of the project's impacts, outputs and outcomes anticipated at appraisal have been achieved.

## **B. Lessons**

39. The project was the third ADB loan to India for rural road development and the second under the Rural Roads Sector II Investment Program. The project has helped the government at both central and state levels to identify gaps in various project implementation activities, and the lessons include those listed below.

40. **Project benefit monitoring.** For investments in physical infrastructure to be effective and sustainable, the investment program needs to focus more on sex-disaggregated data analysis. Road improvements have a high potential to bring improvements in reproductive health, education, possession of movable assets, employment opportunities, and nutrition. Monitoring of selected sex-disaggregated key indicators should be incorporated in future subprojects under the program.

41. **Time requirements for completing a subproject.** Following the PMGSY guidelines, each civil works contract had a stipulated completion period of 12 months. However, it was found that 12 months were insufficient, especially given pre-construction activities, the capability of contractors, and adverse weather conditions in the project area. It was found that at least 15–20 months were needed for all project activities. The proper timing of the signing of civil works contracts in relation to the monsoon period may avoid the loss of construction time due to the monsoon. This should be considered and incorporated into future subprojects under the investment program.

42. **Project readiness and utility relocation.** Project preparation had some weaknesses during the design phase, especially in site reconnaissance and consideration of design alternatives. Strengthening this aspect would avoid problems and associated delays in project implementation. Relocation of electricity poles and telecommunication lines was a common problem faced in almost all contract packages. Therefore, early and precise identification and preparation—such as sufficient survey provision, accurate cost estimation, adequate and timely budgeting, and adequate coordination with concerned departments and state organizations—should be incorporated into future subprojects.

43. **Availability and capacity of the contractors.** The number of contractors was limited and the number of responses from bidders was low. All civil work contractors were local and some lacked working facilities, funding resources, and/or skilled and qualified staff. The weak capacity of some local contractors was a major cause of project delays. Also, some civil works packages were geographically spread out, making it difficult for contractors to manage their resources, labor, and materials. Although some contracts were terminated and new contractors selected for the balance of the work, the overall capacity remained inadequate. In future projects, contract management should be enhanced, and the contract packages could be larger in scale to attract experienced, reputable nationwide or global contractors.



## C. Recommendations

### 1. Project-Related

44. **Project benefit monitoring and evaluation.** The socioeconomic impacts of the investment program are remarkable, but the program was not systematically or continuously monitored. It is recommended that the ADB, in association with the government, design and carry out a long-term socioeconomic monitoring program by carrying out regular surveys and analyses to efficiently track annual changes resulting from the investment program. A set of effective and practical indicators should be used to analyze the impacts. Specifically, sex-disaggregated data should be collected and analyzed, and the results incorporated in future ADB projects to maximize their socioeconomic benefits, especially to the poor.

45. **Timing of the project performance evaluation report.** The project performance evaluation report could be prepared in 2013 or later, by which time most rural roads under the project will have been fully operational for more than 3 years. At that time, traffic development, road maintenance, the physical condition of project property, public transport services, benefits attained, and impacts on poverty can be better assessed.

46. **Design of the PMGSY subprojects.** Future ADB support, especially to the latter phases of the PMGSY, should consider packaging the rural connectivity component with initiatives and programs in socioeconomic development. This may maximize the benefits of all the rural road programs and projects. Also, some emphasis should be placed on capacity building and human resource development for maintenance, and on state-based research and training in rural road development.

### 2. General

47. **Capacity development for project implementation.** In general, capacity in rural road project implementation is still inadequate in Orissa, especially regarding modern concepts and techniques. A capacity-building and human resource development program could be designed and incorporated in future projects. In the mean time, ADB should enhance its training for PIU staff and consultants. Sophisticated computer software and tools for project management (e.g., planning, contract management, road condition monitoring, and financial management) should be purchased and used.

## DESIGN AND MONITORING FRAMEWORK (PROJECT 2)

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks	Results
<b>Impact</b> Contribute to reduction in poverty and deprivation, and support economic growth of the community connected by investment program roads	3–4 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 primary school teacher attendance	Census (next due in 2011)  State and district statistics  Sample impact study conducted by NRRDA  Impact monitoring by the technical support consultant of selected roads in their	Various government rural development schemes are effectively coordinated (assumption)	A large amount of local labor was used by the project, including 184,142 person-months of unskilled labor and 35,814 person-month skilled labor.  The proportion of inhabitants who had completed grade 12 and above increased by 3%, as did the proportion completing grades 10–12, while the proportion who had completed grades 5–10 increased by 4%; there was a decrease of 6% in uneducated inhabitants  Frequency of visiting a clinic or hospital increased by 4% for those visiting at least once a month.
<b>Outcome</b> 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 are disrupted (currently up to 25% of the year, down to less than	OMMAS  State and district statistics  Completion reports of each individual loan and the multitranche financing facility  Sample impact study conducted by NRRDA  Impact monitoring by the technical support consultant of selected roads in their principal villages	Availability of transport modes and services to newly connected habitations (assumption)	It was planned that a total of 30,000 km of rural roads would be rehabilitated, constructed, and/or upgraded under the entire investment program.  Under the project, 1,013 km rural roads were constructed or improved, which connects 336 habitations by all-weather roads  Access to markets, health, and education facilities is unaffected year round.

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks	Results
	<p>15 days per year)</p> <p>Diversified income opportunities in rural areas measured in terms of the number of people obtaining work outside the village and the change in cropping pattern and agricultural produce marketing (increase in perishable crops in both cropping and marketing)</p>			<p>Percentage of inhabitants employed outside of villages increased by 1% and the number of days of employment per year increased by 10 days over the 6-month period after road construction. There was a 1% increase each in the number of inhabitants participating in agriculture and trade and business-related employment.</p>
<p><b>Outputs</b></p> <p>1. Construction and upgrading of rural roads into all-weather standard</p> <p>2. Improved community participation</p>	<p>By the end of the project period (2008):</p> <p>3,144 km (Assam 999 km, Orissa 1,189 km, and West Bengal: 956 km) priority rural roads in the investment program states will be constructed and upgraded to all-weather standard connecting 1,769 rural habitations (Assam 525, Orissa 398, and West Bengal 846)</p> <p>The percentage of roads constructed or upgraded under the investment program that are rated “very good” by national quality monitors will be 30% higher than the current ratings (currently 28% in Assam and West Bengal and 50% in Orissa)<sup>a</sup></p> <p>Each road constructed or upgraded under the investment program will be maintained with a pavement condition index (defined in PMGSY Operations Manual) value of not less than 4</p> <p>Improvements to PMGSY community consultation</p>	<p>OMMAS</p> <p>National quality monitor inspection reports</p> <p>Biennial pavement condition index survey</p> <p>Quarterly progress reports and loan completion reports</p> <p>ADB review missions</p> <p>ADB midterm review mission</p> <p>External monitoring of community participation</p>	<p>Continuous allocation of central government’s funds to PMGSY in the investment program states (assumption)</p> <p>Continuous allocation of state government funds for post-construction maintenance works (assumption)</p> <p>Effective quality control and monitoring of civil works (assumption)</p> <p>Active participation of rural community in planning and preparation of subprojects (assumption)</p>	<p>The road connectivity component of the project was substantially completed by the end of 2010. Upon completion, a total of 1,013 km of all-weather rural roads were constructed and/or upgraded, which connected and benefited 231 rural habitations in Orissa state.</p> <p>The constructed and/or upgraded roads were of good quality; the road surface roughness was within the international roughness index for a comfortable ride (about IRI 4).</p> <p>The contracts for civil works contained a provision of providing 5 years of post-construction maintenance. OSRRA is responsible for maintenance after the first 5-year liability period.</p> <p><i>Zilla panchayats</i> still participate in maintenance planning and provide comments on prioritizing maintenance activities and projects.</p>

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks	Results
	procedures measured by satisfaction of the affected communities			
<b>Activities with Milestones</b> 1.0 Subproject Preparation 1.1 Appraisal of sample subprojects (about 3,200 km) completed by August 2005 2.0 Framework Financing Agreement 2.1 Signed in November 2005 3.0 Periodic Financing Request 3.1 First PFR submitted in November 2005, and updated in June 2006 (for \$180 million), which was turned into project 1 and made effective on 18 October 2006 3.2 ADB review of ongoing subprojects—biannually 3.3 ADB review of states' readiness to implement additional loans—to be done concurrently with above review of ongoing subprojects 3.4 Government to notify ADB of forthcoming PFR—at least 15 days in advance 3.5 Government to submit PFR and ADB to approve the requested financing through execution of a corresponding loan agreement—within 30 days of PFR 4.0 Safeguards 4.1 Social and environmental safeguard frameworks prepared during processing 4.2 For new states to be included under the multitranchise financing facility, safeguard framework documents to be prepared 4.3 Community consultation completed and land made available in accordance with construction schedule—applicable to all subprojects under the facility 5.0 Subproject Implementation 5.1 Civil works contracts under project 1 awarded from November 2005 onward under retroactive financing 5.2 TSC and PIC mobilization expected in January 2007 6.0 Monitoring and Reporting 6.1 Baseline survey by early 2007 6.2 Monthly internal monitoring using OMMAS 6.3 Quarterly progress reporting 6.4 Quarterly external monitoring of safeguard implementation 6.5 Annual impact monitoring at end of 2007, end of 2008, end of 2009, and investment program completion 6.6 Impact monitoring by NRRDA to continue after completion of the investment program			<b>Inputs for Investment Program</b>  ADB OCR financing of \$750 million  Government financing of \$1,350 million  ADB staff time for multitranchise financing facility administration including review of PFRs and preparation of loan/project agreements for individual loans  <b>Inputs for the project at appraisal</b>  ADB OCR financing of \$77.65 million  Government financing of \$22.81 million  ADB staff time for review of PFR and preparation of loan/project agreements for individual loans	ADB appraised the project in 1–5 August 2005.  The FFA was signed on 25 November 2005.  ADB received the first PFR under the investment program on 25 November 2005 and the second on 28 November 2007.  The loan for the project was approved on 17 March 2008, signed on 28 March 2008, and became effective on 9 July 2008.  At completion, \$65.48 million was provided to the project, comprising \$38.10 million from the ADB loan and \$27.38 million from the government's own resources.  TSC for Project 1 continued to work for the project.  Actual cost for the project: Road Connectivity: \$64.71 m Capacity Building: \$0.05 m Financial Charges: \$0.71 m Total: \$65.48 m

ADB = Asian Development Bank; FFA = framework financing agreement; IDC = interest during construction; km = kilometer, MFF = multitranchise financing facility; NRRDA = National Rural Roads Development Agency; OCR = ordinary capital resources; OMMAS = online management, monitoring, and accounting system; PCR = project completion review; PFR = periodic financing request; PIC = project implementation consultant; PMGSY = Prime Minister's Rural Roads Program, TSC = technical support consultant.

<sup>a</sup> During implementation, the rating method for national quality monitors was changed, and this particular indicator was consequently dropped.

### DETAILS OF PROJECT OUTPUT

No	District	no. of Subprojects	no. of Roads	Total Length (km)	Habitations Connected				Total
					>1000	>500	>250	<250	
1	Angul	9	16	74.74	13	2	2	0	17
2	Balasore	1	2	10.44	2	1	0	1	4
3	Bargarh	16	35	136.89	20	8	3	1	32
4	Bhadrak	1	3	9.41	4	0	0	0	4
5	Bolangir	2	5	19.43	4	1	0	0	5
6	Cuttack	1	1	3.76	2	1	0	0	3
7	Dhenkanal	16	43	116.17	27	6	1	0	34
8	Jharsuguda	2	9	19.90	5	3	1	0	9
9	Kalahandi	16	25	109.32	27	7	3	13	50
10	Koraput	13	21	145.63	11	6	21	35	73
11	Malkangiri	5	7	31.30	3	4	4	1	12
12	Nabarangpur	10	18	124.05	6	5	5	4	20
13	Nuapada	5	12	62.02	9	0	1	2	12
14	Rayagada	6	6	49.50	2	5	7	5	19
15	Sambalpur	5	11	33.97	2	7	2	2	13
16	Sonepur	4	10	28.01	5	4	1	0	10
17	Sundargarh	6	14	39.20	15	1	1	2	19
<b>Total</b>		<b>118</b>	<b>238</b>	<b>1013.74</b>	<b>157</b>	<b>61</b>	<b>52</b>	<b>66</b>	<b>336</b>

km = kilometer

Source: National Rural Roads Development Agency

## PROJECT COST AND FINANCING PLAN

Table A3.1: Project Costs (\$ million)

Item	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
Road Connectivity Component	42.87	52.39	95.26	29.12	35.59	<b>64.71</b>
Capacity Building Component		0.15	0.15		0.05	<b>0.05</b>
Contingencies	0.91	1.12	2.03			
Financial Charges	3.02		3.02	0.71		<b>0.71</b>
<b>Total</b>	<b>46.80</b>	<b>53.66</b>	<b>100.46</b>	<b>29.83</b>	<b>35.65</b>	<b>65.48</b>

Sources: Asian Development Bank. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility for India for the Rural Roads Sector II Investment Program*. Manila; Asian Development Bank loan financial information system; Project Implementation Units.

Table A3.2: Financing Plan (\$ million)

Source	At Appraisal				Actual			
	Foreign Exchange	Local Currency	Total Cost	% of Cost	Foreign Exchange	Local Currency	Total Cost	% of Cost
ADB	46.80	30.85	77.65	77.3%	29.83	8.26	38.10 <sup>a</sup>	58.2%
Government		22.81	22.81	22.7%		27.38	27.38	41.8%
<b>Total</b>	<b>46.80</b>	<b>53.66</b>	<b>100.46</b>	100.0%	<b>29.83</b>	<b>35.65</b>	<b>65.48</b>	100.0%

ADB = Asian Development Bank

<sup>a</sup> \$39.56 million of the original loan was cancelled during implementation.

Sources: Asian Development Bank. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility for India for the Rural Roads Sector II Investment Program*. Manila; Asian Development Bank loan financial information system

## DISBURSEMENT OF ADB LOAN PROCEEDS

Table A3: Annual and Cumulative Disbursement of ADB Loan Proceeds (\$ million)

year	Annual Disbursement			Cumulative Disbursement	
	Amount		% of Actual Total	Amount	% of Total
	Projected	Actual			
2008		16.67	43.8	16.67	43.8
2009	27.00	13.01	34.2	29.68	77.9
2010	8.50	7.02	18.4	36.70	96.3
2011		1.40	3.7	38.09	100.0
<b>Total</b>		<b>38.09</b>			

ADB = Asian Development Bank

Source: Asian Development Bank

Figure 3.1. Annual Disbursement of ADB Loan Proceeds (\$ million)

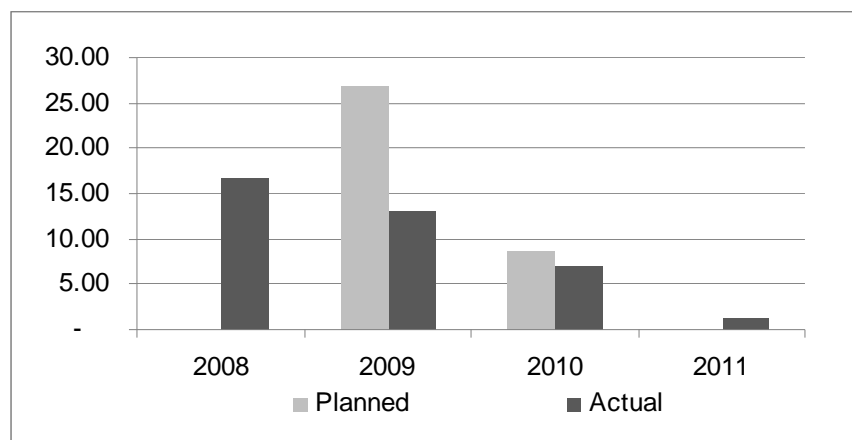
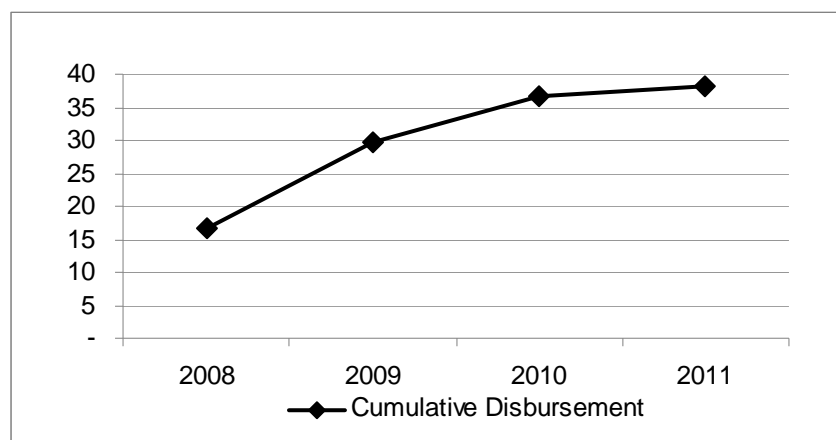


Figure 3.2. Cumulative Disbursement of ADB Loan Proceeds (\$ million)



## ACTUAL PROJECT IMPLEMENTATION SCHEDULES

Item		2006				2007				2008				2009				2010				2011			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Land Acquisition and Resettlement</b>																									
	Land Acquisition and Resettlement																								
<b>Road Connectivity</b>																									
	Preparation																								
	Procurement																								
	Civil Works Construction																								
<b>Consultanting Service</b>																									
	Technical Support Consultant																								
	Project Implementation Consultant																								

At appraisal

At actual

Q = quarter

Sources: The National Rural Roads Development Agency, Asian Development Bank project completion review mission.



## CHRONOLOGY OF MAJOR EVENTS

Date	Main Event
<b>A. Processing of the Multitranche Financing Facility</b>	
<b>2003</b>	
20 November	Rural Roads Sector II Investment Program project preparatory technical assistance (PPTA 4220-IND)
<b>2004</b>	
November 2004	Start of feasibility study
<b>2005</b>	
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	Borrower officially communicated its view that the loan size should be expanded, subject to availability of MFF to the Borrower
Aug. 2005	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 negotiations 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	Circulation of the report and recommendation of the President to the ADB Board
20 December	Board consideration and approval of \$750 million for the investment program
<b>B. Processing of the Second Loan</b>	
<b>2007</b>	
28 November	Second periodic financing request received from the government for an indicative amount of \$77.65 million
<b>2008</b>	
22 February	ADB Management's approval to proceed with negotiations for the second loan
12 March	Second loan negotiations successfully concluded between the government and ADB in India
17 March	ADB approval of the loan
28 March	Signing of the loan and the project agreements

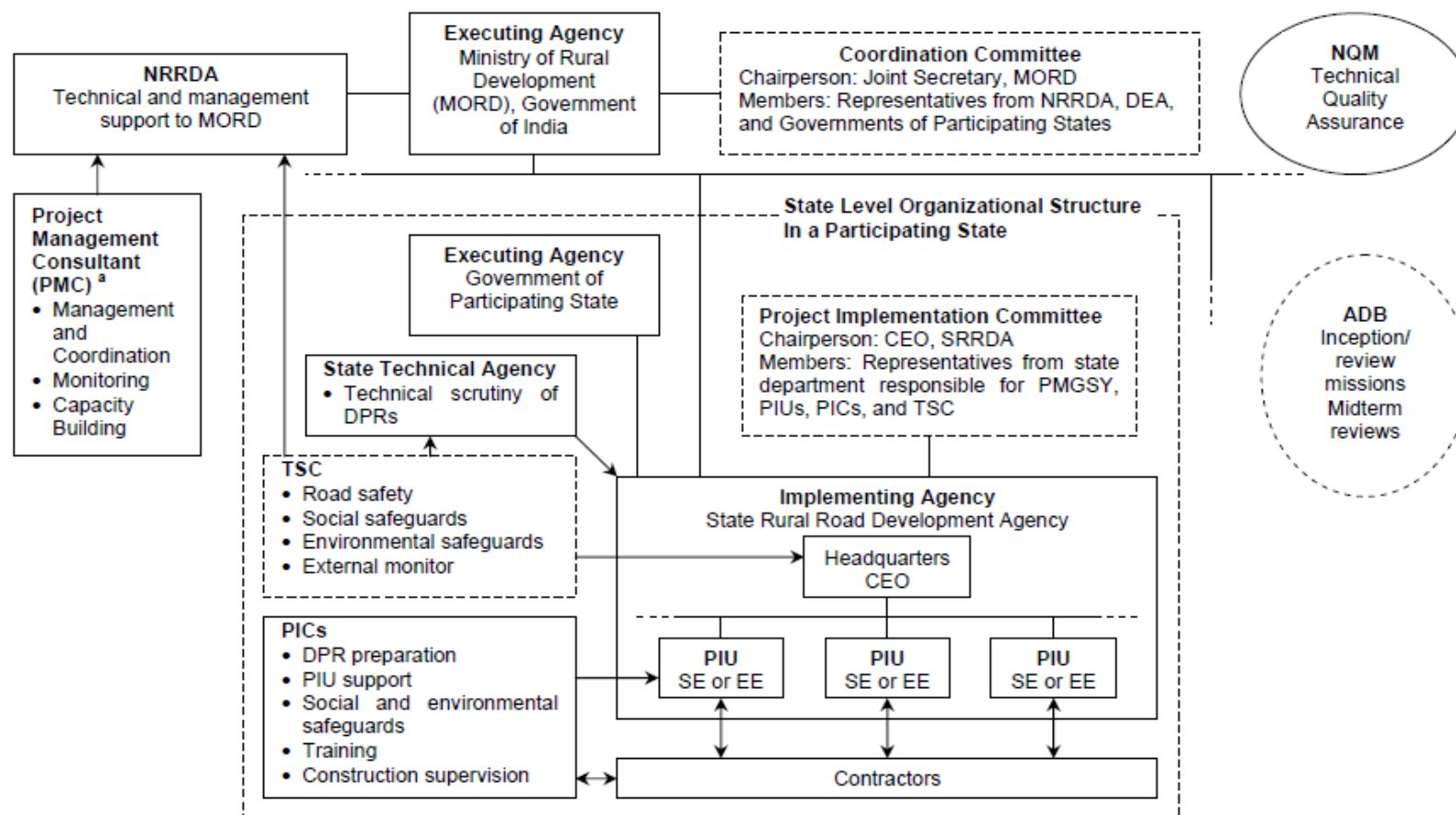
9 July	Loan effectiveness
<b>C. Project Implementation</b>	
<b>2006</b>	
December	Award of the first contract
<b>2007</b>	
August	Completion of contract award for original 151 subprojects
<b>2008</b>	
8–16 April and 24–26 April	ADB project review mission on social safeguard and procurement
7–14 May	ADB project review mission on the RRSII Investment Program
21–22 July	TPRM decided to move 66 fast-moving subprojects from project 1 to project 2
November	First loan disbursement of \$16.67 million
10–18 November and 5–11 December	ADB inception review mission
<b>2009</b>	
January 2009	Contract award for the 30 new subprojects
30 April	First loan partial cancellation of \$24.1 million
30 June	Original project completion date at appraisal
27 July–26 August	ADB project review mission
14 November–2 December	ADB project review mission
31 December	Original loan closing date in the loan agreement
<b>2010</b>	
13 January	Second loan partial cancellation of \$15.0 million
18 June	Tripartite Project Review Meeting at Ahmedabad
30 June	Revised loan closing date after the first extension
2–20 December	ADB project review mission
31 December	Revised loan closing date after the second extension
31 December	Substantial completion of the civil works for all subprojects
<b>2011</b>	
7 April	ADB loan account closed
<b>2012</b>	
13–18 August	ADB project completion review mission

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ADB = Asian Development Bank, MFF = multitranchise financing facility, RRSII = Rural Roads Sector II, TPRM = Tripartite Portfolio Review Meeting

Source: ADB project completion review mission.

## ORGANIZATIONAL STRUCTURE FOR PROGRAM 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; PMC = project management consultant; PMGSY = Prime Minister's Rural Roads Program; SE = superintending engineer; TSC = technical support consultant.

<sup>a</sup> For the Rural Roads Sector I Project

Source: Asian Development Bank. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility for 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
<b>PARTICULAR COVENANTS</b>		
(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	<b>Complied with.</b> MORD and the project state implemented the project with due diligence, efficiently, and in conformity with sound administration.
The Borrower shall make available to MORD, and the State, 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	<b>Complied with.</b> MORD and the project state obtained sufficient support and funds from the central government in a timely manner to carry out the project. Upon completion, total government funding of \$33.05 million equivalent was 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	<b>Complied with.</b> A coordination committee, chaired by the MORD joint secretary and comprised of representatives from relevant agencies, was established to monitor the use of the loan and overall implementation performance. The project was carried out in full compliance with 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	<b>Complied with.</b> MORD and the project states performed their obligations under the project agreement
(a) 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. (b) No rights or obligations under the financing arrangements relating to the Project shall be assigned, amended, abrogated or waived without the prior concurrence of ADB.	LA, Article IV Section 4.05	<b>Complied with.</b> The project was implemented under the financing arrangement in a manner that protected the interests of the Borrower and ADB and accomplished the purposes of the Loan. Under the investment program, five loans were approved and implemented. During implementation, 62 subprojects were shifted from the project to Project 1 and 30 subprojects were added to the project for the purpose of properly using the loan.
<b>PROCUREMENT OF WORKS, AND CONSULTING SERVICES</b>		
3. 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.	LA, Schedule 4 Para. 3	<b>Complied with.</b> The procurement for civil work contracts conformed to ADB's <i>Procurement Guidelines</i> (2007, as amended from time to time). The recruitment of the TSC was in conformance with ADB's <i>Guidelines on the Use of Consultants</i> (2007, as amended from time to time).
4. The PMGSY standard bidding documents and procurement procedures, currently under use for	LA, Schedule 4	<b>Complied with.</b> The procurement of civil works also

Particulars	Reference in Loan Agreement	Status of Compliance
National Competitive Bidding (NCB) (Works) under the ongoing Project 1 for the State shall continue to apply to Subprojects financed out of the proceeds of the Loan. Modifications in this regard, if any required by MORD/State, together with justifications, will be furnished to ADB by the MORD and the State for (i) ADB's concurrence, and (ii) reflecting in the Procurement Plan as required.	Para. 4	followed the PMGSY standard bidding documents and procedures with the agreed ADB financing-specific adjustments in the areas of eligibility, anticorruption, and social and environmental safeguards under the project.
5. 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, 14, and 22 of Schedule 5 to this Loan Agreement have been complied with as applicable.	LA, Schedule 4 Para. 5	<b>Complied with.</b> Works contracts were not awarded until all related requirements in the loan agreements were complied with.
6. Except as ADB may otherwise agree, and except as set forth in the paragraph below, the Borrower through MORD and the State shall apply quality- and cost-based selection for selecting and engaging consulting services.	LA, Schedule 4 Para. 6	<b>Complied with.</b> The TSC was selected and recruited as set forth in covenant 7. No PICs were recruited for the project.
7. The Borrower shall cause MORD to apply the following method for selecting and engaging the specified consulting services, in accordance with, among other things, the procedures set forth in the Procurement Plan: Single Source Selection for the TSC	LA, Schedule 4 Para. 7	<b>Complied with.</b> The TSC service for Project 1 was selected for the project on a single source selection basis, but with adjusted TOR.
<b>EXECUTION OF PROJECT AND OPERATION OF PROJECT FACILITIES</b>		
<b>Execution and Implementation</b>		
1. The Borrower shall ensure that the Project is carried out in accordance with the PMGSY Guidelines as supplemented by Project-specific requirements including those more fully described in the agreed cpf and the EAF for the State, and related IEE for Subprojects. (b) The Executing Agencies for the Project shall be (i) MORD at the central level and (ii) State at the State level. MORD shall be responsible for overall supervision and execution of the Project at central level	LA, Schedule 5 Para 1	<b>Complied with.</b> The project was implemented in full accordance with PMGSY guidelines. As arranged during project preparation, the executing agencies for the project were MORD (central level), and the Orissa state government (state level). MORD was responsible for overall supervision and execution of the project.
2. The 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	<b>Complied with.</b> The execution of the project was assisted by the state government in terms of obtaining approvals and clearances for timely project implementation under the PMGSY guidelines. No issues were observed in obtaining approvals and clearances.
3. The 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 estimates), utility relocation, general Project management expenses, and road maintenance, in a timely manner through approved annual budget allocations.	LA, Schedule 5 Para 3	<b>Complied with.</b> Over half (17) of the state's 30 districts were involved in the project; they were to execute subprojects in their corresponding districts. A Project Implementation Unit (PIU) was established in each district; the PIUs were headed by chief executive officers responsible for overall coordination of project implementation in their districts, including planning, management, consultant selection, and procurement.
4. The State shall ensure that the PICs recruited	LA,	<b>Complied with.</b>

Particulars	Reference in Loan Agreement	Status of Compliance
under Project 1 continue to help implement the provisions of the CPF and the EAF (and related IEE) for all Subprojects in the State under this Project.	Schedule 5 Para 4	The PIC was engaged for monitoring the implementation of the CPF and EAF.
<b>Coordination Committees</b> 5. (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) The 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	<b>Complied with.</b> The Coordination Committee set up under Project I and the state-level standing committee had regular meetings to monitor the use of the loan and the overall project implementation performance.
<b>Road Maintenance</b> 6. In accordance with the PMGSY Guidelines, the 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 State through its additional budget allocations, or other alternative sources of financing.	LA, Schedule 5 Para 6	<b>Complied with.</b> The project state has been allocating adequate financing for rural road maintenance as per PMGSY guidelines. The allotment for routine maintenance increased from Rs17.5 million in FY 2006 to Rs400.0 million in FY 2013.
7. The State shall ensure that the financing of maintenance of PMGSY roads as required under the PMGSY Guidelines shall not involve reduction of budgets for maintaining other roads under the responsibility of the State not included under the PMGSY.	LA, Schedule 5 Para 7	<b>Complied with.</b> The allotment for routine maintenance increased from Rs17.5 million in FY 2006 to Rs 400.0 million in FY 2013.
8. As also required under the PMGSY Guidelines, except as ADB may otherwise agree, the State shall require the IA (through the PIU) to ensure proper maintenance of the PMGSY roads until these are transferred to the designated zilla panchayats in accordance with the PMGSY Guidelines. The State shall also allocate the requisite funds to the relevant functionaries (the related PIU/zilla panchayat) for such maintenance in accordance with the requirements of the PMGSY Guidelines.	LA, Schedule 5 Para 8	<b>Complied with.</b> According to the latest arrangement, OSRRA is responsible for road maintenance after the first 5-year liability period. However, <i>zilla panchayats</i> (district governments) still participate in maintenance planning and provide comments on prioritizing maintenance activities and projects.
9. The State shall ensure that the related PIU/zilla panchayat as the case may be, shall enter into further maintenance contracts with competitively procured contractors (on the basis of the standard performance-based contracts for road maintenance to be prepared by PMC under Rural Roads Sector I Project (Loan No. 2018)). The contracts shall begin upon completion of the initial 5-year maintenance period under the related construction contracts and shall cover routine maintenance and renewal of all PMGSY roads for further periods of not less than 5 years.	LA, Schedule 5 Para 9	<b>Complied with.</b> With the budget provided by the state government, the regional PIUs employ contractors to carry out routine and periodic maintenance of all PMGSY and project roads. In general, PIUs grant 5-year contracts to contractors for the maintenance, including annual routine maintenance and one periodic maintenance for every contracted road in the contract period. The PIUs are also responsible for monitoring road conditions and developing maintenance plans according to road conditions.
<b>Road Safety</b>		

Particulars	Reference in Loan Agreement	Status of Compliance
10. As part of the mid term 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	<b>Complied with.</b> The midterm review for the project was waived. The PMC consultants under Loan 2018 developed a road safety guide and road safety campaign materials. The TSC was entrusted with reviewing the road safety program in the project state.
<b>Land Availability</b> 11. The 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	<b>Complied with.</b> CPF provisions were implemented for all subprojects under the project.
12. The 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	<b>Complied with.</b> The assessment during project formulation 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 (for shoulder adjustment and drainage construction) would be required. No affected persons were relocated due to the minor scale of land acquisition.
13. (a) The State shall ensure that the IA shall (i) carry out the community consultation process for all Subprojects in accordance with the PMGSY Guidelines as supplemented by the CPF (and 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 civil 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. (b) The State shall ensure that 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	<b>Complied with.</b> Documentation for each subproject was prepared according to the CPF and EAF/ECOP. The TSC reviewed the documents for necessary compliance. The procedures in the CPF were followed to ensure that project preparation was participatory and the process for land donation/transfer was undertaken in a transparent manner. The PIUs carried out the community consultation process for all subprojects in accordance with the PMGSY guidelines as supplemented by the CPF, including disseminating information (on the land transfer process and land availability, support provisions, and grievance procedures) to the project-affected communities in a timely manner. The implementing agencies ensured that voluntary land donation and transfer was undertaken in a transparent manner and supported by proper documentation, and avoided any kind of coercion or forced donation and transfer.
<b>Execution of Civil Works Contracts</b> 14. (a) 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 include the cost required for implementing the EMP in its bid.	LA, Schedule 5 Para 14	<b>Complied with.</b> Land donation was generally done on time; the government ensured timely clearances were obtained from forest, railway and revenue departments where necessary.

Particulars	Reference in Loan Agreement	Status of Compliance
(b) 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.		
15. The 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 15	<b>Complied with.</b> All sections or parts thereof were handed over to the contractors only after the applicable CPF, EAF, and ECOP provisions were complied with.
16. 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 16	<b>Complied with.</b> All changes (to land alignments or environmental impacts of subproject roads) were approved by ADB or MORD .
<b>Social Impacts</b> 17. (a) The State shall ensure through specific provisions in the bid documents and the civil works contracts financed under the Project that the contractors shall: (i) disseminate information at work sites on the risks of sexually transmitted diseases and HIV/AIDS as part of the health and safety measures for those employed during construction; (ii) follow legally mandated provisions on health, welfare, sanitation, and appropriate working conditions, including accommodation, where appropriate, for construction workers at camp sites; (iii) comply with all applicable labor laws, not employ child labor for construction and maintenance activities, and provide appropriate facilities for children of labor in construction camp sites; (iv) provide equal opportunity for women for road construction activities, and not differentiate wages for men and women for work of equal value. (b) The State shall ensure that compliance with provisions in clause (a) of this paragraph is monitored by the IA. The civil works contracts shall also provide for their termination by the employer for breach of any provision.	LA, Schedule 5 Para 17	<b>Complied with.</b> The bid documents and the civil works contracts financed under the project (i) included provisions to disseminate information at work sites on the risk of sexually transmitted diseases and HIV/AIDS as part of the health and safety measures for those employed during construction; and (ii) 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, and ensured child labor would not be employed, and equal pay for equal work for women. Women were employed through NREGA to carry out tree plantation along the shoulders of the road, preparatory work for the road sub base, and strengthening the earthen shoulders of the roads. As per the guidelines of NREGA while providing employment priority is given to women in such a way that at least one- third of the beneficiaries are women who have registered for work under the scheme. The government and the PIUs properly monitored implementation of the contracts.
18. The State shall ensure acceptance of the Project	LA,	<b>Complied with.</b>



Particulars	Reference in Loan Agreement	Status of Compliance
through effective community participation in selecting and implementing Subprojects in accordance with the PMGSY Guidelines as supplemented by the CPF (and related IEE).	Schedule 5 Para 18	The implementing agencies ensured that project information was disseminated and communities were consulted in accordance with the PMGSY guidelines as supplemented by the CPF.
19. 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 19	<b>Complied with.</b> In areas of scheduled tribes, the government and PIUs followed the requirements in the CPF regarding any impact on land involving traditional and tenure rights of the scheduled tribes.
<b>Environment</b> 20. 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 20	<b>Complied with.</b> Only those subprojects meeting the subproject selection criteria and procedures were financed from the loan proceeds. The government and the PIUs closely monitored project progress.
21. The State shall ensure that: (i) Subprojects shall be implemented in accordance with the EAF (and related IEE); (ii) relevant provisions of the ECOP (and related IEE) identified in the Subproject preparation stage are incorporated into the Subproject designs and followed during Subproject design, construction, operation and maintenance; and (iii) Project documentation related to environment will be maintained and kept orderly throughout Project life.	LA, Schedule 5 Para 21	<b>Complied with.</b> The project state incorporated a standard environmental management plan in their bidding documents for civil works. The contractors responded to the EAF and ECOP requirements by submitting the costs in their bills of quantities.
22. The State shall require its SRRDA 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 will be undertaken on sections of Subprojects that pass through a forest reserve unless clearance is granted by the Borrower's Ministry of Environment and Forest under applicable laws and regulations of the Borrower and the 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 22	<b>Complied with.</b> Assisted by the consultants, the project states monitored the implementation of the environmental mitigation measures.  An ADB mission in July–August 2009 visited selected subproject roads in the project area for implementation of the investment program. The mission specifically conducted a detailed review of environmental safeguards. The review revealed no serious adverse environmental impacts associated with the project.
<b>Subproject Selection and Approval Process; Subprojects Implementation</b> 23. 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 23	<b>Complied with.</b> All the subprojects were selected and prepared based on the subproject selection criteria and procedures under PMGSY guidelines and approved by ADB.

Particulars	Reference in Loan Agreement	Status of Compliance
<b>Performance Audit</b> 24. 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 24	<b>Complied with.</b> The financial accounts and statements for the project were audited annually by chartered accountants, and the audited financial reports were submitted to ADB.
<b>Project Performance Monitoring and Progress Reports</b> 25. The State shall ensure under the Investment Program Performance Monitoring System (IPPMS) established by the IAs (established under Project 1), the respective IA shall undertake periodic Subproject performance review under the Project, as also for the Investment Program, in accordance with the IPPMS to evaluate the scope, implementation arrangements, progress and achievements of objectives of the Project and overall Investment Program.	LA, Schedule 5 Para 25	<b>Complied with.</b> A socioeconomic impact survey was carried out for the project. The TSC implemented the monitoring of the socioeconomic impact of the project roads under the investment program, including some sample roads in Orissa, and including a baseline and follow-up surveys. The monitoring reports were submitted to ADB.
26. Notwithstanding the generality of Section 2.08 of the Project Agreement: (a) the State through the IA shall provide monthly progress report of Subprojects implementation under the Project, in such form and detail as required by ADB. (b) Based on the monthly reports provided by the State, MORD with assistance of NRRDA, shall prepare and provide ADB with quarterly progress reports on subprojects' implementation in the State. Such reports shall summarize the monthly reports and include report on progress made during the period of review, use of Loan funds, achievement of Project objectives, compliance with Loan covenants, changes if any on implementation schedule, problems or difficulties encountered and remedial actions taken, and work to be undertaken in coming quarter. The reports that shall be submitted to ADB within 45 days from close of each quarter shall also include a summary financial account for the Project (including the Subprojects), expenditures to date, and report on benefit monitoring undertaken pursuant to previous paragraph of this Schedule.	LA, Schedule 5 Para 26	<b>Complied with.</b> The implementation agencies prepared all monthly progress reports and submitted them to NRRDA, which submitted all quarterly project progress reports to ADB in a timely manner. The progress reports were for several loans under the investment program.
<b>Reports and Review</b> 27. (a) Without limiting the generality of Section 2.08(c) of the Project Agreement and Section 7.04(d) of the Loan Regulations, the Borrower will submit to ADB a Project completion report within 3 months of physical completion of the Subprojects financed under the Loan and a Facility completion report within 3 months of physical completion of the Subprojects under the Facility. These reports shall cover a detailed evaluation of the Project and the Investment Program respectively, 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 the Project and Investment Program, for the State as may be requested by	LA, Schedule 5 Para 27	<b>Complied with.</b> NRRDA prepared a domestic project completion report generally in the ADB requested format, which was submitted to ADB before the ADB PCR mission.  <b>Complied with.</b>

Particulars	Reference in Loan Agreement	Status of Compliance
<p>ADB.</p> <p>(b) ADB, the Borrower, and the 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.</p> <p>(c) A mid-term review of the Project shall be undertaken by ADB, the Borrower and the State, around December 2008. The mid-term review will include review of issues and any problems or weaknesses in implementation arrangements, and agree on any changes needed to achieve the objectives of the Project.</p> <p>(d) A similar mid-term review of the Investment Program by ADB, the Borrower and the State shall be undertaken in the third year from date of approval of the Facility by ADB.</p>		<p>During implementation, ADB conducted six review missions, some of which were combined with reviews for other projects under the investment program. Several tripartite meetings were held to discuss critical issues regarding project implementation.</p> <p><b>Complied with.</b></p> <p>The ADB midterm review mission was waived in consideration of the satisfactory progress in project implementation, and the absence of any major difficulties. The investment program was reviewed as needed through periodic review missions.</p>
<p><b>Project Implementation Consultants (PIC)</b></p> <p>28. The services of domestic consultants financed from the Borrower's own resources (the PIC), shall be utilized in the carrying out of the Project, particularly with regard to assisting the PIUs and the IAs in:</p> <p>(a) preparing additional subprojects;</p> <p>(b) implementing the CPF provisions;</p> <p>(c) monitoring and implementing the EAF (and related IEE) and the relevant provisions of the ECOP (and related IEE); and</p> <p>(d) support in social and environmental safeguard.</p>	<p>LA, Schedule 5 Para 28</p>	<p><b>Complied with.</b></p> <p>The PICs were engaged to implement environment and social safeguard monitoring. The TSC provided substantial training and guided the PIUs to implement the engineering tasks originally assigned to the PIC using their own resources.</p>

ADB = Asian Development Bank; CPF = community participation framework; EAF = environmental assessment and review framework; ECOP = environment code of practice; FFA = framework financing agreement; IEE = initial environment examination; LA = loan agreement; MFF = multitranchise financing facility; MORD = Ministry of Road Development; NRRDA = National Rural Roads Development Agency; PCR = project completion review; PIC = project implementation consultant; PIU = project implementation unit; PMGSY = Prime Minister's Rural Roads Program; SRRDA = State Rural Roads Development Agency; TOR = terms of reference; TSC = technical support consultant. Source: ADB project completion review mission.

## SUMMARY OF CONTRACT PACKAGES FOR CIVIL WORKS

No	District	no. of Contracts	no. of Roads	Total Length (km)	Procurement Method	Contract Dates	Contract Cost	Contract Variation	Actual Cost	
									Rs Million	\$ Equivalent
Road Connectivity										
1	Angul	9	16	74.74	NCB	23/12/06 - 30/08/08	218.70	(8.92)	209.78	4.67
2	Balasore	1	2	10.44	NCB	27/02/08 - 27/02/08	35.44	(2.11)	33.32	0.74
3	Bargarh	16	35	136.89	NCB	28/02/07 - 13/08/08	418.65	(11.90)	406.75	9.06
4	Bhadrak	1	3	9.41	NCB	25/10/08 - 25/10/08	51.00	(4.35)	46.65	1.04
5	Bolangir	2	5	19.43	NCB	27/02/07 - 30/08/07	51.09	(2.79)	48.30	1.08
6	Cuttack	1	1	3.76	NCB	21/09/08 - 21/09/08	14.10	(2.94)	11.16	0.25
7	Dhenkanal	16	43	116.17	NCB	27/02/07 - 01/01/09	425.20	(61.86)	363.34	8.09
8	Jharsuguda	2	9	19.90	NCB	15/03/07 - 30/04/08	59.79	(3.44)	56.35	1.26
9	Kalahandi	16	25	109.32	NCB	26/12/06 - 29/09/07	344.87	(2.16)	342.71	7.64
10	Koraput	13	21	145.63	NCB	26/02/07 - 10/02/09	507.60	(150.92)	356.69	7.95
11	Malkangiri	5	7	31.30	NCB	10/05/07 - 20/05/07	89.88	(35.08)	54.80	1.22
12	Nabarangpur	10	18	124.05	NCB	07/03/07 - 19/03/08	330.59	(1.56)	329.03	7.33
13	Nuapada	5	12	62.02	NCB	09/03/07 - 29/06/07	197.10	(4.04)	193.06	4.30
14	Rayagada	6	6	49.50	NCB	22/02/07 - 23/03/07	158.30	(1.25)	157.05	3.50
15	Sambalpur	5	11	33.97	NCB	02/03/07 - 04/11/08	113.35	(2.78)	110.57	2.46
16	Sonepur	4	10	28.01	NCB	01/03/07 - 08/03/07	75.51	(1.26)	74.26	1.65
17	Sundargarh	6	14	39.20	NCB	14/03/07 - 01/08/08	131.90	(21.04)	110.86	2.47
Total		118	238	1,013.74			3,223.07	(318.40)	2,904.67	64.71

( ) = negative, NCB = national competitive bidding

Source: Implementation agency, Asian Development Bank project completion review mission

## SUMMARY OF CONTRACT PACKAGES FOR CONSULTING SERVICES

Consultant	Name	Procurement Method	Contract Dates	Contracted Cost (Rs)	Contract Variation	Actual Cost	
						Rs million	\$ equivalent
TSC Consultant	Operation Research Group	QCBS	09/04/07	6.73		0.20	0.00
PIC Consultant	MSV International	SSS	31/10/07	2.20		2.20	0.05
<b>Total</b>				<b>8.93</b>	<b>0.00</b>	<b>2.40</b>	<b>0.05</b>

PIC = project implementation consultant, QCBS = quality- and cost-based selection, SSS = single source selection, TSC = technical support consultant

Source: Implementation agency, Asian Development Bank project completion review mission

## ECONOMIC REEVALUATION

### A. General

1. The Asian Development Bank (ADB) project completion review (PCR) mission conducted an economic re-evaluation of the project using similar methodology as that used at appraisal with updated data. In the without-project case, it was assumed that the original state of the rural roads would be retained. In the with-project case, roads were assumed to be improved so that vehicles could drive at faster speeds with lower operating costs and less travel time. Economic benefits were calculated by comparing the with- and without-project cases, the economic internal rate of return (EIRR) was calculated, and a sensitivity analysis was carried out.

### B. Traffic Development

2. During the preparation of the investment program, a traffic survey was conducted for the sample roads that found the traffic volume on the subproject roads averaged around 400 vehicles per day. The average traffic composition was 30%–35% motorized traffic and 65%–70% nonmotorized traffic. A traffic forecast was then carried out based on the income elasticity of the transport demand. The overall traffic growth rate was estimated to average 6.5% for 2007–2017 and 6.0% for 2018 and beyond. During implementation of the investment program, the technical support consultant (TSC) conducted a baseline traffic survey (in June 2008) on the selected sample roads in the project area; the TSC also did follow-up traffic surveys in January 2009 on the same sample roads.<sup>1</sup> A significant rise in the proportion of traffic that was motorized (from 54.24% to 58.45%) was observed on the project roads between the baseline and second survey. During the PCR mission, a due diligence traffic survey was conducted in the project area, by which the latest traffic counts on 35 sample roads (30 project roads and 5 control roads) were collected.<sup>2</sup> The traffic survey results (Table A10.3) confirmed that traffic increased significantly after completion of the project roads, with an even greater increase in the number of passenger vehicles (small passenger vehicles and buses). Based on this analysis, the rate of increase for future traffic on the project roads was also adjusted. It was assumed that traffic would increase by an average of 11.1% in 2013–2017 and 9.0% thereafter.

**Table A10.1 Adjusted Traffic Forecast (% per year)**

Period	Truck	Bus	Tractor with Trailer	MCV	LCV	Car, Jeep, Van, 3W	2W	Average
2013–2017	9.0	12.0	5.0	9.0	10.0	15.0	10.0	11.1
2018 onwards	7.0	10.0	5.0	6.0	7.0	11.0	9.0	9.0

MCV = medium commercial vehicle, LCV = large commercial vehicle, 2W = two wheel vehicle, 3 W = three wheel vehicle

Source: Asian Development Bank project completion review mission

### C. Economic Costs

<sup>1</sup> ADB. 2009. *Socio-economic Impact Assessment Report, Orissa – Rural Roads Sector II Investment Program*. Consultant's report. Manila (ADB Loan 2248-IND).

<sup>2</sup> To verify the traffic status after project completion, a consultant team was recruited to conduct a due diligence traffic survey of selected project roads; 35 sample roads were selected in 10 districts of Orissa state.

3. The project costs consist of capital and maintenance costs. The actual capital cost for the project was about 34.8% lower than that at appraisal, mainly due to scope changes. The unit cost per kilometer (km) for the road connectivity component was decreased by 19.6% due to lower contract prices and reduced construction quantities.<sup>3</sup> Actual annual expenditures were used in the economic reevaluation. In considering the existing road conditions and future traffic levels, it was assumed that the routine maintenance cost would be Rs23,500 per year per km.<sup>4</sup> It was also assumed that periodic maintenance would constitute about 20% of the capital cost and would take place every 5 years.<sup>5</sup> The financial costs for both capital and maintenance were converted into economic costs with the use of a standard conversion factor of 0.85 in the project area.

#### **D. Economic Benefits**

4. Using a similar methodology as that used at appraisal, it was assumed that the main sources of economic benefits were vehicle operating cost (VOC) savings, passenger travel time cost savings, and other nonquantified benefits. The benefit calculation only considered normal and diverted traffic; induced traffic was excluded from the benefit calculation.

5. The VOC savings were recalculated using unit VOC data for different road roughnesses, which were adopted from the report and recommendation of the President for the multitranche financing facility and adjusted for inflation.<sup>6</sup> The VOC savings per vehicle km were estimated at Rs26.8 for trucks; Rs25.5 for buses; Rs21.5 for tractors with trailers; Rs25.1 for medium commercial vehicles; Rs25.9 for large commercial vehicles; Rs6.9 for cars, jeeps, and vans; and Rs2.1 for two-wheel vehicles. Average passenger vehicle speeds were assumed to be 40–50 km/hour for the with-project cases and 25 km/hour for the without-project cases. Passenger travel time cost savings were recalculated for different types of passenger vehicles. The passenger time cost was derived from the gross domestic product per capita of Orissa state in 2009–2010 and was estimated to increase 6%–7% each year to reflect increased incomes in the near future. 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. Due to unavailability of data, 10% was added to the VOCs and time cost savings to reflect other benefits, such as socioeconomic development in the project area, poverty reduction, reduced accident cost, and savings in maintenance costs for the without-project case. The benefit calculation results show that the VOC savings constituted a major portion (about 82.6% in 2012) of the total benefits, but passenger time cost benefits are projected to increase rapidly along with socioeconomic development and increased incomes (about 31.1% in 2031).

#### **E. Economic Re-evaluation**

6. The recalculated EIRR was 21.5%. Compared with the 18.0% calculated at appraisal,<sup>7</sup> the higher EIRRs were mainly caused by lower unit costs for the road improvement and higher actual traffic levels compared to those estimated at appraisal. The recalculated

<sup>3</sup> At appraisal, the total cost was estimated to be \$100.46 million and the total length of the roads was 1,200 km. The actual total project cost was \$65.62 million and the total road length was 1,013 km.

<sup>4</sup> The PCR mission was told that the average routine maintenance cost was about Rs12,000–Rs35,000 per km for the Prime Minister's Rural Roads Program (PMGSY) roads.

<sup>5</sup> The PMGSY guidelines state that periodic maintenance is to be conducted every 5 years.

<sup>6</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility for India for the Rural Roads Sector II Investment Program*. Manila.

<sup>7</sup> In the multitranchise financing facility (MFF), the overall EIRR for the sample subprojects was 18.0% (15.6% for Assam, 18.0% for Orissa, and 20.1% for West Bengal).

EIRR is above the ADB-recommended social discount rate of 12% and the project can be considered economically viable. The details of the economic evaluation are in Table A10.4. The EIRR were subjected to a sensitivity analysis to test different scenarios. The test results show that the project continues to be economically viable for all scenarios. For the low traffic case (20% lower than normal traffic), the EIRR was 18.5%. In the case of a combination of both a 20% maintenance cost increase and a 20% benefit reduction, the EIRR would be 18.3% for the project. The sensitivity test also shows that the EIRR is more sensitive to changes in benefits than in costs; consequently, the government should pay more attention to socioeconomic development in the project area and implement policies to stimulate transport services and increase incomes of the villagers. The results of the sensitivity tests are in Table A10.2.

**Table A10.2 Sensitivity Test**  
(Rs million)

<b>Scenarios</b>		<b>EIRR (%)</b>	<b>ENPV</b>
<b>Base Case</b>		<b>21.5%</b>	<b>4,290.3</b>
Sensitivity Tests			
1	Maintenance Cost 10% Higher	21.4	4,246.4
2	Maintenance Cost 20% Higher	21.3	4,202.5
3	Benefits 10% Lower	20.0	3,514.8
4	Benefits 20% Lower	18.5	2,739.3
5	Benefits 10% Higher	22.8	5,065.9
6	Benefits 20% Higher	24.1	5,841.4
7	Maint. Cost 10% Higher & Benefits 10% Lower	19.9	3,470.9
8	Maint. Cost 20% Higher & Benefits 20% Lower	18.3	2,651.5

EIRR = economic internal rate of return, ENPV = economic net present value

Source: the ADB project completion review mission

Table A10.3 Traffic Counts of Sample Roads in 2012

SI No	Block	Package	Road	Length	Trucks	Buses	Tractors with Trailers	MCV+LCV	Car, Jeep, Van, 3W	2W	Cycle	Cycle Rickshaw / Cycle Van	Animal Drawn Vehicle
1	Angul	OR-01-ADB-08/II	RD Road Badakanthakul	3.57	3	2	5	14	34	56	165	30	5
2	Angul	OR-01-ADB-08/II	Jamugadia Kanja	6.8	5	0	8	21	46	46	202	28	6
3	Angul	OR-01-ADB-08/II	Sankhapur -Kaleipada	3.57	2	1	4	20	28	44	174	24	4
4	Banarpal	OR-01-ADB-06-II	NH-42 to Raniguda (J)	3.89	8	2	12	26	54	74	198	38	3
5	Banarpal	OR-01-ADB-06-II	NH 42 Budhapanka	2.5	10	0	10	23	34	58	179	24	4
7	Dhenkanal	OR-09-ADB-08-II	T3 to Nadiali (NC)	3	5	0	9	27	26	30	142	11	19
8	Dhenkanal	OR-09-ADB-08-II	Nadiali to Regeda (NC)	3.36	3	0	5	17	14	47	126	3	8
9	Hindol	OR-09-ADB-21-II	T3 to Iswarpal (NC)	1.63	5	0	9	23	26	30	116	11	19
10	Hindol	OR-09-ADB-21-II	Gandanali to Iswarapal chhack (upto Block border)	5	18	24	24	21	34	72	176	25	6
11	Hindol	OR-09-ADB-21-II	T-3 to Chilitala (NC)	1.45	3	0	5	17	13	23	76	6	8
12	Hindol	OR-09-ADB-21-II	T-3 to Kansara (NC)	2	3	0	5	17	10	23	94	3	8
14	Attabira	OR-03-ADB-07/ II	Janged to Sodapali	2.85	1	0	11	10	14	58	174	28	8
15	Attabira	OR-03-ADB-07/ II	NH6 to Janged	6.75	7	0	22	18	31	66	184	44	5
16	Attabira	OR-03-ADB-06/ II	Bugbuga R. D. Road to Kulunda (UG)	0.6	4	0	8	12	26	47	147	38	6
17	Attabira	OR-03-ADB-06/ II	Bugbuga R. D. Road to Kulunda (NC)	1.4	2	0	6	10	20	48	198	27	8
18	Attabira	OR-03-ADB-06/ II	Bugbuga to Jhilmunda	3.04	1	0	8	8	18	56	174	22	7
19	Attabira	OR-03-ADB-06/ II	N.H.6 to Mahakhand	2.5	1	0	7	6	12	49	147	18	9
20	Bargarh	OR-03-ADB-10/ II	NH6 to Nagenpali	2	1	0	10	15	12	42	126	16	6
21	Baragarh	OR-03-ADB-09/ II	Turunga to Launsara	9.7	2	0	14	24	41	40	187	30	12
23	Koraput	OR-19-ADB-08-II	P.W.D. Road to Dumuripadar	7.775	1	0	7	6	12	45	108	6	8
24	Koraput	OR-19-ADB-08-II	Dumuriguda to Gunjiguda	1.5	2	0	4	5	10	38	98	10	9
25	Koraput	OR-19-ADB-08-II	P.W.D. Road to Aripuraghati	1.2	1	0	6	4	9	34	88	9	11
27	Lephipada	OR-30-ADB-06/II	Lephipada to Kulabira	5	4	0	8	20	26	42	157	34	7
28	Lephipada	OR-30-ADB-06/II	PWD to Kadamal	3.6	2	0	7	22	18	28	141	23	6
30	Kesinga	OR-15-ADB-15-II	NH217 - Turlakhaman	3.9	2	0	16	24	18	48	140	22	12
31	Kesinga	OR-15-ADB-15-II	RD Road - Pipalpadar	1.65	1	0	7	11	12	23	94	14	8
32	Kesinga	OR-15-ADB-18-II	Julko - Kandel	8	4	0	18	18	18	41	122	15	9
33	Kesinga	OR-15-ADB-17-II	Laitara - Dendoguda	4.05	1	0	8	10	14	38	104	12	14
34	Bhawanipatna	OR-15-ADB-08-II	Belpada - Bobhata	3.6	2	0	7	14	20	74	176	14	15
35	Bhawanipatna	OR-15-ADB-11/II	Karlapada - Utkela	3	3	0	14	24	24	64	146	18	12

MCV = medium commercial vehicle, LCV = large commercial vehicle, 2W = two wheel vehicle

Source: ADB project completion review mission



**Table A10.4 Economic Re-evaluation of the Project**  
(Rs million)

year	Capital	Cost Maintain	Total	VOC	Time Cost	Benefit Others	Total	Net Benefit	NPV	Accumulate of NPV
2007	23.8		23.8					(23.8)	(37.5)	(37.5)
2008	928.8		928.8					(928.8)	(1,304.9)	(1,342.4)
2009	804.3		804.3					(804.3)	(1,008.9)	(2,351.2)
2010	524.3		524.3					(524.3)	(587.2)	(2,938.5)
2011	216.9		216.9	261.9	19.5	28.1	309.5	92.6	92.6	(2,845.9)
2012		0.0	0.0	334.9	29.0	36.4	400.3	400.3	357.4	(2,488.5)
2013		0.0	0.0	431.0	43.3	47.4	521.6	521.6	415.8	(2,072.7)
2014		0.0	0.0	473.8	53.1	52.7	579.7	579.7	412.6	(1,660.1)
2015		0.0	0.0	521.3	65.3	58.7	645.3	645.3	410.1	(1,250.0)
2016		20.2	20.2	574.0	80.3	65.4	719.7	699.5	396.9	(853.1)
2017		20.2	20.2	632.4	98.8	73.1	804.3	784.1	397.2	(455.8)
2018	499.6	20.2	519.9	697.3	121.6	81.9	900.8	380.9	172.3	(283.5)
2019		20.2	20.2	751.7	142.6	89.4	983.8	963.5	389.2	105.6
2020		20.2	20.2	810.7	167.3	97.8	1,075.8	1,055.6	380.6	486.3
2021		20.2	20.2	874.6	196.3	107.1	1,178.0	1,157.7	372.8	859.0
2022		20.2	20.2	943.9	230.4	117.4	1,291.7	1,271.4	365.5	1,224.5
2023	499.6	20.2	519.9	1,019.1	270.3	128.9	1,418.3	898.4	230.6	1,455.1
2024		20.2	20.2	1,100.7	317.1	141.8	1,559.6	1,539.3	352.8	1,807.9
2025		20.2	20.2	1,189.3	372.1	156.1	1,717.5	1,697.3	347.3	2,155.2
2026		20.2	20.2	1,285.5	436.7	172.2	1,894.4	1,874.2	342.4	2,497.6
2027		20.2	20.2	1,390.1	512.5	190.3	2,092.8	2,072.5	338.1	2,835.7
2028	499.6	20.2	519.9	1,503.7	601.4	210.5	2,315.7	1,795.8	261.5	3,097.2
2029		20.2	20.2	1,627.3	705.8	233.3	2,566.5	2,546.2	331.1	3,428.4
2030		20.2	20.2	1,761.8	828.4	259.0	2,849.2	2,829.0	328.5	3,756.8
2031	(1,998.5)	20.2	(1,978.2)	1,908.2	972.3	288.0	3,168.4	5,146.7	533.5	4,290.3
Net Present Value (NPV):									4,290.3	
Economic Internal Rate of Return (EIRR):									21.5%	
Discount Rate:									12%	

( ) = negative, NPV = net present value , VOC = vehicle operation cost,  
Source: ADB project completion review mission

## SUMMARY OF THE SOCIOECONOMIC IMPACTS

### A. Introduction

1. During implementation of the investment program, a combination of a before-, after-, with- and without-project study was undertaken by the technical support consultant (TSC) to gauge the socioeconomic impact of the project. The surveys covered a sample of 20 habitations<sup>1</sup> in 6 districts of the state. For proving and updating the analysis, a due diligence survey was conducted in July 2012, which included a quick traffic survey and social impact analysis. All data and analysis from this appendix are derived from the socioeconomic impact assessment report for Orissa prepared by the TSC in 2008 and the due diligence survey conducted during July 2012.<sup>2</sup>

### B. Socioeconomic Impacts

#### 1. Connectivity Improvement

2. 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 tracer surveys conducted in the 6 districts, the average distance to the workplace increased by about 1 km, whereas the average time taken to reach the workplace decreased by 0.75 hours. This demonstrates that, with improved connectivity, inhabitants are able to expand the area where they seek employment and that although distance increases, travel time decreases. During the conduct of the due diligence survey in July 2012, villagers in Launsara Village in Bargarh District reported that the journey time to the nearest town (9 km away) was 2–3 hours by bicycle (more during the rainy season) prior to connectivity. With improved connectivity, the journey takes 20–30 minutes by motorcycle or 45 minutes by bicycle.

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 that have taken place in communities since connectivity, especially with a partner who is a non-resident, and (on average) a tripling of the number of trips made for social interaction. The latest traffic counts on some sample roads are in Appendix 10.

#### 2. Transport Service Providing

4. **Public transport service.** Buses, jeeps, vans, and three-wheel vehicles provide reliable public transportation between newly connected villages and nearby towns and cities. In sample habitations, daily service to habitations increased by an average of 100% for buses, and 175% for jeeps, vans and 3-wheel vehicles. During the same period, control habitations saw a

<sup>1</sup> The survey in the six districts covered 15 sample habitations on the project roads and 5 control habitations on the control roads; 50 households were selected randomly, and about 292 people were interviewed. Of these, 157 (54%) were male, and 135 were female (46%). In addition, 15 separate focus group discussions were conducted with women.

<sup>2</sup> ADB. 2009. *Socio-economic Impact Assessment Report, Orissa – Rural Roads Sector II Investment Program*. Consultant's report. Manila. (ADB Loan 2248-IND).

decrease in public transportation services. Women use public transport but some preferred to use it with a group or with male family members. However, when necessary, women were comfortable using public transportation by themselves.

5. **Private transport service.** Table A11.1 details the average change in the percentage of motorized versus non-motorized vehicles on the project roads versus the control roads.

**Table A11.1: Motorized Versus Non-motorized Vehicles on Project and Control Roads**

Item	June 2008		July 2012		Change in Motorized Traffic	
	Project Road	Control Road	Project Road	Control Road	Project Road	Control Road
Motorized Traffic	25.55%	24.02%	35.58%	30.04%	+10.03%	+6.02%
Non-motorized Traffic	77.07%	75.98%	64.42%	69.96%		

Source: Executing agency (June 2008 data), and socioeconomic impact survey (July 2012 data)

6. 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. Motorcycles are nearly always operated by men, but in a few sample habitations women were using mopeds. Some female health workers were using mopeds to travel between habitations. There has been a decrease in the number of bicycles, but it was observed that these are the main mode of transportation used by students to reach school. The number of bullock carts is decreasing, although at a slower rate. Over time, it is envisaged that the number of motorized vehicles will continue to increase while the number of non-motorized vehicles will decrease.

### 3. Government Services Accessibility

7. **Government programs and schemes.** 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.

8. **Information accessibility.** Based on the data validation focus group discussions, prior to the increase in connectivity most rural inhabitants had difficulties obtaining information about various government assistance schemes and even more difficulties in accessing them. Due to the improved connectivity, rural populations now have better access to all government schemes through 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.

9. **Security.** In areas of unrest with frequent attacks by insurgency groups, the improved roads have allowed government security forces better access to remote habitations in order to provide security. For example, in the insurgency-affected districts of Dhenkanal, Malkangiri, Koraput and Raygada, communities noted that the security situation has improved following improvements in the rural road network.

#### 4. Livelihood Improvement

10. Improved connectivity has increased livelihood opportunities for rural inhabitants. The surveys on sample habitations showed better access to markets has led to an average increase of about 40% in income levels in the principal village compared to only 10% in the control village. Improved links have also increased overall per capita expenditure levels. Average per capita monthly expenditure increased by 30% in the principal village compared to 11% in the control village. Data validation 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 30%). Savings levels have increased dramatically in some socioeconomic groups but have declined somewhat in the non-poor and ultra-poor groups. Focus group discussions indicated that among villagers who reported a decline in savings, expenditures were mostly for large, one-time purchases. Among the non-poor, these items were typically motorcycles or upgrading of mobile phones; for the ultra-poor, it was typically for household goods or agricultural inputs. Villagers believed that, in the long run, savings levels would increase due to better connectivity.

#### 5. Agriculture Development

11. 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.

12. In the project state the extension services offered by government agricultural extension officers and *gram sewaks* (local officers) to the habitations increased, with a 500% increase in the number of visits by *gram sewaks* and a 400% increase in visits by agriculture extension officers in most sample habitations. The 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 and the Campaign for Seed Treatment, which began in 2007.<sup>3</sup> There has been about a 10% increase in farmers using crop diversification since connectivity, and that number will continue to increase. Mechanization of farming has also been 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; with the added efficiency and inputs, farmers are now switching from food crops to cash crops such as vegetables, maize, and sugar cane. There has also been an increase in cropping intensity as a result of improved agricultural trade. An increase in dairy farming activities was also noted in some of sampled villages, with farmers taking advantage of the improved connectivity and their relative proximity to urban centers.

13. The roads have allowed more farmers to visit *haats* (nearby markets). On average about 25% more farmers are now visiting *haats* regularly. The average level of visits per month increased by 200%. Connectivity has also reduced transport costs to markets, mainly by decreasing the amount of produce that spoils or is damaged during transit and by increasing the amount of produce that can be transported. Previously, farmers and women would use bullock

<sup>3</sup> <http://india.gov.in/citizen/agriculture/viewscheme.php?schemeid=1816>;  
<http://india.gov.in/outerwin.php?id=http://dacnet.nic.in/ppin/Seedtreatment.htm>

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 connectivity, farmers use tractors or motorcycles to quickly and efficiently bring products to the *haats*. Farmers reported a reduction of around 15% in the amount of produce that spoils, is wasted, or is damaged while in transit, with many more products able to reach the market.

## 6. Government Employment Programs

14. Increased connectivity has improved the delivery and implementation of different types of schemes operated by the central and state governments. Villagers who qualify subscribe to employment programs under the National Rural Employment Guarantee Act, which was established in 2005. The objective of the act is to enhance livelihood security in rural areas by providing at least 100 days of wage employment in a financial year to every household whose adult members undertake unskilled manual work. Work includes the construction of non-PMGSY roads within the habitation, flood control projects, and irrigation projects.<sup>4</sup> In nearly all habitations, officials noted that all persons who qualify in the habitation subscribed to the scheme. The implementation of the project used a large amount of local labor, with a total of 219,956 person-months of labor, including 184,142 person-months unskilled labor and 35,814 person-months of skilled labor. Most of the laborers used by the project were local residents.

15. Most habitations operated multiple self-help groups for women. These groups were either started by the government's Swarnjayanti Gram Swarozgar Yojana scheme or by nongovernment organizations. The scheme's objective is to bring poor families above the poverty line by providing training and assistance to set up income-generating enterprises. The scheme is based on local requirements. Most frequently, groups are involved in sewing or providing midday meals for local schools. The surveyors also found that a small percentage of women owned or operated microenterprises in the habitations.

## 7. Female Employment and Gender Empowerment

16. Women have benefited greatly from improved connectivity. Road connectivity has increased the mobility of women as they can now travel alone in buses and on bicycles to and from nearby towns and cities. Focus group discussions during data validation revealed that, since connectivity, there were more women's self-help groups, as well as more women working outside of the home as government workers, shopkeepers, and daily wage laborers.

17. There has also been an increased role for women in local governance. Focus group discussions indicated that throughout the project state, at least 50% of the habitations had a woman as the *sarpanchni* (the democratically elected head of a village statutory institution of local self-government). This phenomenon is mostly driven by 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.

18. 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. There has been a significant decrease in the journey time between habitations and government health facilities, leading to a reduction in maternal and

<sup>4</sup> Government of India. 2008. *NREGA Operating Guidelines*. New Delhi.

neonatal deaths. In terms of education, parents are now more confident and willing to send their daughters to schools and colleges, as the transportation to school, especially to higher levels of education, is more reliable. Children now cycle or take the bus to school or college instead of walking.

## **8. Commercial Activities**

19. The general level of commerce in rural habitations is low. The number of microenterprises at the habitation level has been slowly increasing. In the project state, the survey estimates that new microenterprises at the habitation level increased by about 1.5%, 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 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. Examples include grocery shops, tailors, motorcycle and bicycle repair shops, seed and fertilizer shops, DVD shops, barbers, and shoe repairers.

20. Villagers have reliable access to financial services. For the purchase of motorcycles, most villagers indicated they use their own savings; however, some villagers also indicated that they take out a loan for the purchase. For larger vehicles such as a tractor, farmers are able to access financing plans through dealers.

## **9. Education**

21. Prior to improved connectivity, the majority of habitations had good access to primary and middle schools; however, higher secondary schools were on average 8 km away, posing transportation problems, particularly during the monsoon season. Children walked an average of 8–10 km to access higher education facilities. Connectivity has impacted education in three ways: (i) the travel time to education facilities outside of habitations has been reduced, (ii) teacher attendance and the number of teachers in habitations has improved, and (iii) school enrollment has improved through safer travel and more consistent provision of the government-sponsored midday meal program.

22. Travel time to education facilities outside of the habitation has decreased as a result of 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 Dumuripadar in Koraput District, the number of young people pursuing secondary education outside of the habitation has increased from 1 to 4. The proportion of inhabitants who had completed grade 12 and above increased by 3%, as did the proportion completing grades 10–12, while the proportion who had completed grades 5–10 increased by 4%; there was a decrease of 6% in uneducated inhabitants.

23. Increased connectivity has improved teacher attendance by about 5% and increased the amount of time teachers spend in the school. Villagers reported that prior to road construction teachers would show up to school during the rainy season but would arrive late and leave early. Therefore, the increase of 5% in teacher attendance rate may underestimate the actual impact of connectivity on teacher attendance rate. The number of teachers at the primary school level has also increased after the construction and/or upgrading of roads.

24. Improved transport has improved school attendance rates through safer travel and the implementation of government schemes. The percentage of unenrolled children dropped by

about 78%. Parents reported that improved connectivity has led to an increase in the number of girls in attendance. Most parents mentioned that they were now more confident about sending their daughters to schools unescorted. The government-sponsored midday meal scheme for up to grade 8 was established in 1995.<sup>5</sup> The program has helped improve student attendance rates and has contributed to increased employment for rural women, who typically are involved in organizing and cooking the midday meals.

## 10. Health and Medical Care

25. Prior to improved connectivity, the availability of health services was reported to be poor in the habitations, despite many habitations having a multipurpose health worker whose job was to provide basic health care, including immunization. Attendance rates of these health workers varied greatly and some were spending very little time in each habitation due to long travel times. Transportation options for carrying sick people or pregnant women to health care institutions were by bullock carts or by hiring a tractor. The safe delivery rate was high in the state (above 93%), partly due to the traditional *dhai* (or midwife) system attending to deliveries.

26. Connectivity has improved access to health care for rural communities. Travel time to health care facilities has decreased on average by 30 minutes (on average, for the entire year) and by as much as 90 minutes during the rainy season in some habitations. The frequency of visiting a clinic or hospital increased by 4% for those visiting at least once a month.

27. Multipurpose health workers reported that they were spending more time in each community due to shortened travel time. Many now travel by motorcycle, moped, or bicycle in between the habitations they service. Improved connectivity has also helped implementation and delivery of the National Rural Health Mission, which aims to strengthen the Panchayati Raj institutions and promote access to improved healthcare through Accredited Female Health Activities. The scheme also strengthens existing primary health care centers and community health centers. Neonatal and maternal health has improved due to all-weather connectivity. Difficult pregnancies and deliveries have benefitted the most. The government implemented the Janani Suraksha Yojana Scheme and Sukhibhava Schemes in 2003,<sup>6</sup> but without good connectivity, service delivery was reported to be very low. Villagers who are on average about 5 km from the health centers report the schemes are fully used, with almost 100% of births taking place in government health care facilities; most villagers take full advantage of ambulatory services provided under the scheme. Ambulatory care was rated as rapid and dependable.

## 11. Land Value and Building Materials

28. When comparing the land value of sample habitations versus nearby control habitations, the land price per acre increased on average by about five times in habitations with improved connectivity.

29. The price increase can be partially attributed to better connectivity but is also caused by factors such as (i) habitations receiving a new or improved irrigation scheme during the period of road construction, (ii) some nearby developing industries taking advantage of the

<sup>5</sup> <http://india.gov.in/outerwin.php?id=http://education.nic.in/mdm/mdm.asp>

<sup>6</sup> The two schemes are implemented in a combined manner. A total cash incentive is paid to rural pregnant women below the poverty line for antenatal care, institutional care during delivery, as well as post-partum care. Women undergo delivery in a government health care institution, i.e., teaching hospitals, district headquarters hospitals, area hospitals, community health centers, and other government hospitals. [http://india.gov.in/citizen/health/janani\\_suraksha.php](http://india.gov.in/citizen/health/janani_suraksha.php)

government's industrialization policy (iii) an increase in the habitation population (normally about 1% per annum), and (iv) villagers choosing to stay in the community instead of seeking employment outside after better connectivity. The demand for land increased dramatically in some habitations. Land values in connected rural habitations are forecast to continue to increase as a result of improved access coupled with increased demand.

30. There is a clear distinction in the construction materials used for homes and public buildings in connected versus unconnected habitations. Buildings in habitations with all-weather roads are more likely to be constructed out of more permanent materials such as bricks, laterite stones, concrete, and corrugated tin. It was observed during the validation mission that trucks have started moving along the newly connected roads to transport laterite stones that are locally available in some villages; some villages had also started brick-making facilities to provide building materials to newly connected habitations. Buildings in unconnected areas typically use non- or semi-permanent building materials such as mud, thatch, straw, and other natural materials.

### C. Conclusion

31. Improved connectivity has impacted rural living conditions by giving communities more reliable and rapid access to outside products, services, information, and social links, and by allowing external service and product providers and social contacts to 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 services, livelihoods, commercial activities, education, health, land value, building materials, social interactions, and gender empowerment. The roads have acted as a catalyst for sustained improvements in living conditions and will be a conduit for continued development in rural India.

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

33. 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. The Rural Connectivity Investment Program that is currently under preparation will incorporate more robust impact evaluation to better yield quantitative measurements of the effectiveness of ADB's efforts to support the government's PMGSY scheme.<sup>7</sup>

34. Further evaluation of the impact of the project will be useful after additional time has passed to allow socioeconomic benefits to be realized. In addition, ADB and the Government of India should closely monitor any negative impacts that may develop, especially in the areas of

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<sup>7</sup> ADB. 2012. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranchise Financing Facility, Technical Assistance, and Administration of Technical Assistance to India for the Rural Connectivity Investment Program*. Manila (\$800 million, approved on 12 July 2012).



road safety, illegal access and extraction of natural resources, outward migration, land affordability, and increases in incidents of HIV/AIDS and human trafficking.

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

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	
Batch of Subprojects and States	Batch I in Assam, Orissa and West Bengal	Batch II in Orissa	Batch II in Assam and West Bengal	Batch III in Assam, Orissa, and West Bengal	in 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	<b>30,000.00<sup>a</sup></b>
Actual	2,927.13	1,013.74				
Habilitations Impacted (no.)						
Anticipated	1,767	231				<b>19,000</b>
Actual	1,503	336				
Loan Amount						
Original	\$180.00 million	\$77.65 million	\$130.00 million	\$185.00 million	\$222.20 million	<b>\$750.00 million</b>
Revised	\$173.90 million	\$38.10 million				
ADB Approval	31 July 2006	17 March 2008	26 September 2008	7 August 2009	6 July 2010	<b>20 December 2005</b>
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	31 December 2012			

ADB = Asian Development Bank, IND = India, km = kilometer, MFF = multitranchise financing facility

Note: Actual data are used for projects 1 and 2.

<sup>a</sup> Original expectation of the MFF; however, the total anticipated road length of the five MFF projects was 13,834 km.

Source: Asian Development Bank and ADB project completion review mission.