



Completion Report

Project Number: 25322
Loan Number: 1450
November 2006

Nepal: Rural Infrastructure Development Project

CURRENCY EQUIVALENTS

Currency Unit – Nepalese rupees (NRe/NRs)

		At Appraisal (30 April 1996)		At Project Completion (30 June 2005)
NRe1.00	=	\$0.0176		NRe1.00 = \$0.0141
\$1.00	=	NRs 56.750		\$1.00 = NRs70.940

ABBREVIATIONS

ADB	–	Asian Development Bank
DCO	–	district consultant office
DDC	–	district development committee
DIU	–	district implementation unit
DOLIDAR	–	Department of Local Infrastructure Development and Agricultural Roads
DRUC	–	district road users' committee
DTO	–	district technical office
EA	–	executing agency
IA	–	implementing agency
LDO	–	local development officer
LEP	–	labor-based, environment-friendly and participatory
LRUC	–	local road users' committee
MLD	–	Ministry of Local Development
MTR	–	midterm review
NGO	–	nongovernment organization
PMO	–	project management office
VDC	–	village development committee
SOE	–	statement of expenditure

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 15 July. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2006 ends on 15 July 2006.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Nepal
2.	Loan Number	1450
3.	Project Title	Rural Infrastructure Development Project
4.	Borrower	Government of Nepal
5.	Executing Agency	Ministry of Local Development
6.	Amount of Loan	SDR8.43 million
7.	Project Completion Report Number	941

B. Loan Data

1.	Appraisal	
	– Date Started	21 February 1996
	– Date Completed	8 March 1996
2.	Loan Negotiations	
	– Date Started	21 May 1996
	– Date Completed	23 May 1996
3.	Date of Board Approval	27 June 1996
4.	Date of Loan Agreement	27 August 1996
5.	Date of Loan Effectiveness	
	– In Loan Agreement	26 November 1996
	– Actual	26 September 1996
	– Number of Extensions	None
6.	Closing Date	
	– In Loan Agreement	30 June 2003
	– Actual	30 June 2005
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	1% per annum
	– Maturity (number of years)	40
	– Grace Period (number of years)	10

9. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
30 January 1997	28 September 2006	116 months
Effective Date	Original Closing Date	Time Interval
26 September 1996	30 June 2003	81 months

b. Amount (SDR)

Category	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
Civil Works-Construction	3,978,000	5,278,000	1,300,000	5,278,000	5,599,545	(321,545)
Civil Works-Maintenance	348,000	198,703	(149,297)	198,703	198,703	
Institutional Development	279,000	94,243	(184,757)	94,243	93,453	790
Equipment	411,000	143,027	(267,973)	143,027	143,026	1
Materials	130,000	71,300	(58,700)	71,300	54,702	16,598
Consulting Services	957,000	1,597,000	640,000	1,597,000	1,524,368	72,632
Incremental Operating Costs	275,000	201,022	(73,978)	201,022	232,859	(31,837)
BME Expenses	39,000	20,000	(19,000)	20,000	12,682	7,318
Service Charge	184,000	184,000		184,000	184,000	
Unallocated	1,833,000	646,705	(1,186,295)	646,705		646,705
Total	8,434,000	8,434,000		8,434,000	8,043,339	390,661

BME = Benefit, Monitoring and Evaluation

10. Local Costs (Financed)	
- Amount (\$ million)	9.3
- Percent of Local Costs	66.02
- Percent of Total Cost	59.96

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	2.2	1.4
Local Currency Cost	14.7	14.2
Total	16.9	15.6

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	3.9	4.0
ADB Financed	11.9	10.6
Beneficiaries	0.8	0.8
Total	16.6	15.4
IDC Costs		
Borrower Financed		
ADB Financed	0.3	0.2
Total	16.9	15.6

ADB = Asian Development Bank, IDC = interest during construction.

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

Component	Appraisal Estimate	Actual
A. Development of Rural Roads and Structures and Village-level Development Support	9.2	12.3
B. Awareness Campaign for Rural Infrastructure Development	0.3	0.2
C. Project Support	3.3	2.9
Total Base Cost	12.8	15.4
Physical Contingency	1.3	0
Price Contingency	2.5	0
Service Charge	0.3	0.2
Total	16.9	15.6

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants		
Implementation Consultant I	March 1997	21 March 1997
Supervision Consultant II		21 November 2003
Social, Financial and Technical Audit		3 February 2003
Benefit, Monitoring and Evaluation		5 March 2004
Civil Works Contract		
Date of Award	1 January 1998	1 July 1997
Completion of Work	30 June 2003	30 June 2005
Equipment and Supplies		
Dates		
First Procurement	1 July 1997	1 July 1997
Last Procurement	30 June 2003	14 April 2001
Other Milestones ^b		
Loan Reallocation		16 April 2003
Extension of Loan Closing Date		12 May 2003
Final Cancellation of Undisbursed Loan Balance		28 September 2006

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress ^a
From 27 June 1996 to 31 December 1996	S	S
From 1 January 1997 to 31 December 1997	S	S
From 1 January 1998 to 31 December 1998	S	S
From 1 January 1999 to 31 December 1999	S	S
From 1 January 2000 to 31 December 2000	S	S
From 1 January 2001 to 31 December 2001	PS	S
From 1 January 2002 to 31 December 2002	PS	S
From 1 January 2003 to 31 December 2003	S	S
From 1 January 2004 to 31 December 2004	S	S
From 1 January 2005 to 30 June 2005	S	S

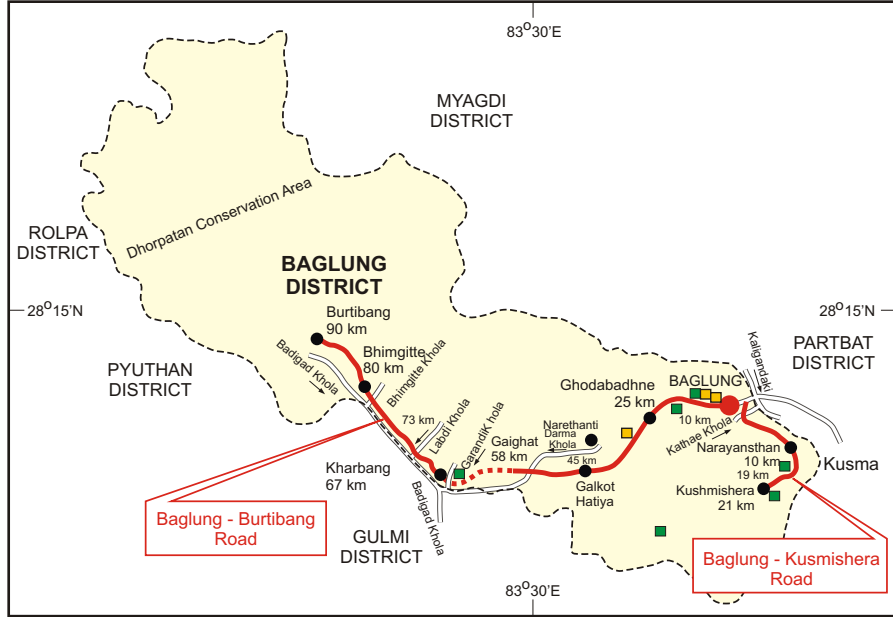
^a S—satisfactory, PS—partly satisfactory.

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Inception Mission	24 Sep–30 Sep 1996	1	6	a
Review 1	21 July–24 July 1997	1	3	a
Review 2	11 Nov–21 Nov 1997	3	30	a, b, c
Review 3	15 May–11 June 1998	2	54	a, d
Review 4	26 Feb–5 Mar 1999	1	7	a
Review 5	11 Dec–15 Dec 1999	1	4	e
Special Loan Administration	17 July–24 July 2000	2	20	e, f
Midterm review	11 Sept–23 Sept 2000	2	24	e, g
Special Loan Administration	30 Sept–06 Oct 2001	4	24	e, f, h, i
Review 6	14 Dec–18 Dec 2001	5	16	e, h, j, k, l
Review 7	07 Oct–12 Oct 2002	4	20	e, h, l, n
Review 8	09 May–26 May 2003	2	34	h, i
Review 9	10 Dec–18 Dec 2003	4	32	h, i, m, n
Review 10	16 June–25 June 2004	3	27	i, m, n
Review 11	30 Sept–8 Oct 2004	4	32	i, m, o, p
Review 12	24 May–3 June 2005	2	20	i, m, n
Project Completion Report ^b	7 Mar–11 Mar 2006	3	12	i, m, n

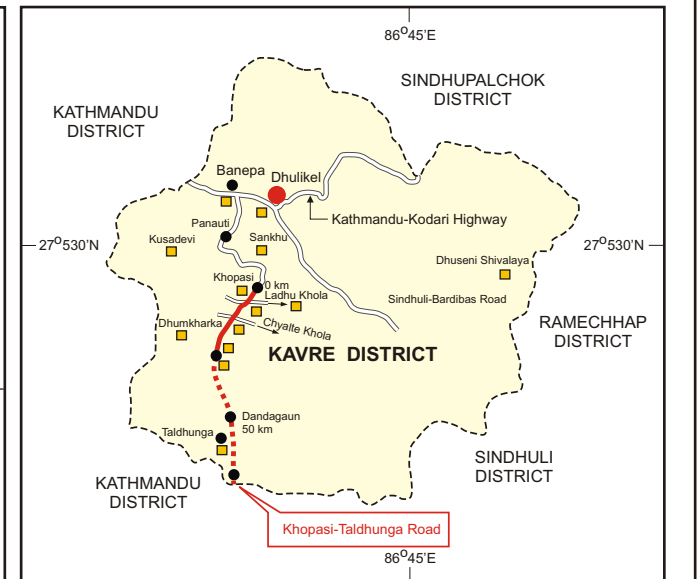
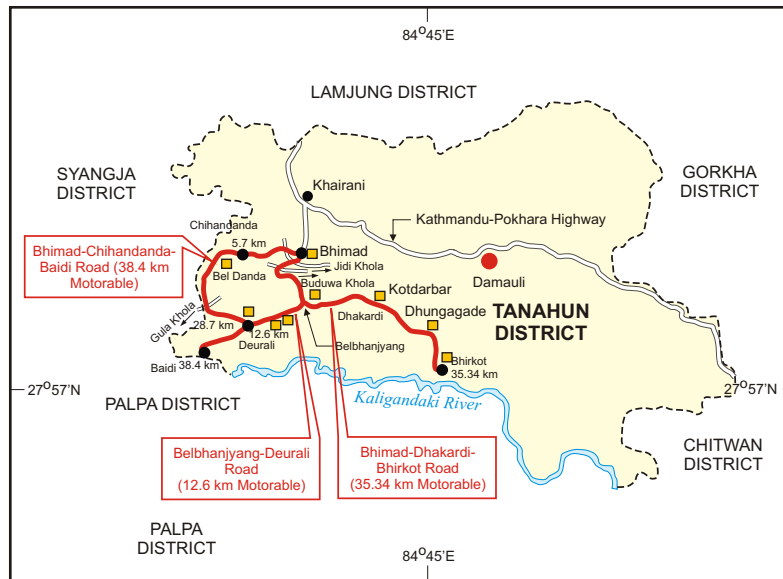
^a a = project economist, b = senior control officer, c = program officer, d = staff consultant (labor-based engineering), e = rural development specialist (Mission leader), f = rural infrastructure engineer, g = staff consultant (soil-bioengineering), h = Senior project implementation officer (mission leader), i = project administration unit head, j = consultant (social and institution specialist), k = consultant (accounting and record keeping), l = consultant (technical audit specialist), m = project officer (mission leader), n = assistant project analyst, o = assistant disbursement analyst p = executive assistant.

^b The project completion report was prepared by Laxmi Sharma, Project Officer.



NEPAL RURAL INFRASTRUCTURE DEVELOPMENT PROJECT

- National Capital
 - District Headquarters/Station Head
 - Community Building/Handed Over
 - Project Road
 - Existing Motorable Road
 - Non Motorable/Partially Completed
 - Project Road
 - District Boundary
 - Regional Boundary
 - International Boundary
- Boundaries are not necessarily authoritative.



I. PROJECT DESCRIPTION

1. At project appraisal in 1996, agriculture accounted for about 80% of the total labor force and 44% of the gross domestic product of Nepal. The lack of an effective rural infrastructure to support agricultural production and marketing was inhibiting the growth of the agriculture sector. The Rural Infrastructure Development Project therefore aimed to support the building of rural infrastructure within the framework of the Government's decentralization policy.

2. The Project was expected to reduce poverty among the rural population in the hill region. The anticipated outcomes were better access to remote villages and a higher standard of living for local people. It was anticipated that the Project would be implemented in three hill districts: Baglung, Tanahun, and Kabhre. A design and monitoring framework (Appendix 1) has been formulated by the project completion review mission, based on the original project framework.

3. The Project had three components.¹

- (i) **Construction of rural roads² and structures.** This included construction of approximately 250 km of earth roads passable by motorized vehicles along six road alignments, together with critical structures including drains, culverts, and stone causeways.
- (ii) **Construction of village multipurpose buildings.** This included construction of about 90 multipurpose community buildings.
- (iii) **Awareness campaigns for rural infrastructure development.** This included campaigns to promote public awareness of (a) the advantages of labor-based and environment-friendly approaches to rural road construction and maintenance; (b) the importance of local self-help initiatives; (c) the need for active participation by women in community development; and (d) the long-term benefits of environmental protection.

4. ADB approved a loan of special drawing rights 8.434 million (currently equivalent to \$11.3 million) for the Project on 27 June 1996. The Loan Agreement was signed on 27 August 1996 and became effective on 26 September 1996. The Ministry of Local Development (MLD) was the Executing Agency (EA). The Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) executed the Project on behalf of the Ministry. At the Government's request, the loan was extended by 2 years, with a revised closing date of 30 June 2005. The Project was considered substantially complete by June 2005.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

5. The project's design and formulation were consistent with the Government's strategy contained in the Eighth National Development Plan (FY1992–FY1997), which accorded special priority to hill development and targeting of rural people. The Eighth Plan stressed the need to

¹ ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Nepal for the Rural Infrastructure Development Project*. Manila.

² As defined in the Nepal Road Classification and Design Standards (February 1994) of the Department of Roads, there are five road classes in Nepal. The term "rural roads" refers to district and village roads. District roads connect villages to markets and higher classes of roads, while village roads link single villages.

build village road networks and to link remote villages to market centers and the national road network. The Agriculture Perspective Plan³ identified the development of an extensive rural road network as a critical factor for the long-term growth of the agriculture sector. The current Tenth National Development Plan (FY2002–FY2007) of the Government emphasizes rural infrastructure development and the Project helped to implement the government's priorities. The Government adopted a Local Infrastructure Development Policy 2004⁴ to support and accelerate the sustainable development of local infrastructure.

6. The project was consistent with ADB's country operational program and strategy (1994–1997) for Nepal at the time of approval.⁵ The overall objective of the strategy was poverty reduction through broad-based, labor-absorbing economic growth. The strategic priorities of ADB during 1994–1997 included concentrating on projects that induced growth in agriculture, the provision of physical and social infrastructure, and environment protection. The project remains relevant to ADB's country strategy and program at completion, given the continuing need to reduce poverty in rural areas. ADB's country strategy and program⁶ (2005–2009) emphasizes supporting the Government of Nepal to (i) achieve sustained poverty reduction through broad-based growth in the development of rural areas, and (ii) improve access by the poor to basic services, opportunities for economic advancement, and participation in development projects. Strengthening infrastructure and connectivity within rural areas is one of ADB's strategies for agricultural and rural development in Nepal for 2005–2009.

7. Overall, project preparation and formulation were adequate. The project scope and its components were highly relevant to achieving the intended project outcome and impacts because they were labor-based and environment-friendly and employed a participatory approach. The Project was prepared under ADB technical assistance (TA).⁷ The TA, and the ADB fact-finding and appraisal missions, was carried out in close association with other development partners, particularly the Swiss Agency for Development Cooperation and GTZ, and incorporated their experiences and lessons while formulating the Project.⁸

8. Experiences from ADB's past and ongoing projects were incorporated into the project. These included the need to (i) have simple and clear-cut implementation arrangements; (ii) involve beneficiaries in planning, implementation, and maintenance; (iii) carry out advance actions to establish institutions and deploy staff; and (iv) ensure strong commitment and ownership by the Government in terms of staff assignments, budget allocations, and logistical support.

9. Extensive social surveys were conducted during the feasibility study to collect baseline information that could be used to assess the project's impact evaluation.⁹ A monitoring and

³ In 1995, the Government adopted the 20-year Agricultural Perspective Plan as the principal strategy to promote rural development.

⁴ The policy promotes decentralization in managing public resources, and the phased devolution of local infrastructure ownership to local bodies. The policy has a strong emphasis on poverty alleviation and social inclusion. It supports the 5-year Tenth Plan and Poverty Reduction Strategy Paper and the Agricultural Perspective Plan, which promotes agriculture as the basis of rural economic development.

⁵ ADB. 1994. *Country Operational Program Paper 1994–1997*. Manila.

⁶ ADB. 2004. *Country Strategy and Program (2005–2009): Nepal*. Manila.

⁷ ADB. 1993. *Technical Assistance to the Kingdom of Nepal for the Rural Infrastructure Development Project*. Manila.

⁸ The concept, technical approach, and tested practices of the projects assisted by the Swiss Agency for Development Cooperation and GTZ in Palpa and Dhading districts were the basis of the project design.

⁹ ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Nepal for the Rural Infrastructure Development Project*. Manila.

evaluation system that relied mainly on inputs collected at the field levels was established. District implementation units (DIUs) in each district development committee (DDC) were given the responsibility for collecting data for monitoring and evaluation, particularly on inputs and outputs. However, neither the project management office nor ADB appear to have followed up strongly on outcome monitoring and evaluation. Benefit monitoring and evaluation studies were undertaken during the first and last years of the Project.

10. The Project's road alignments were determined and agreed with local communities during project formulation. However, the criteria, procedures, and mechanisms to ensure the links between the construction of rural roads (component 1) and the construction of village multipurpose buildings (component 2) were not addressed adequately in the project document. As a result, these buildings were constructed without adequate consideration being given to road alignments and the location of markets in widely scattered locations and most buildings are currently not being used optimally.

B. Project Outputs

11. The targeted outputs during appraisal were: (i) construction of 250 km of earth roads passable by motor vehicles; (ii) construction of 90 community buildings; and (iii) the carrying out of 150 awareness programs. Works under the Project were prioritized by DDCs, in consultation with user groups, with the aim of completing critical road networks within the extended project period. Construction of rural roads and structures received a much higher priority from DDCs than community buildings, the number of which to be built under the Project was reduced from 90 to 31. Actual project outputs are compared with appraisal targets in Appendix 2. Overall, actual project outputs were broadly in line with those anticipated at the time of appraisal except for the construction of community buildings.

12. **Construction of Rural Roads and Structures.** It was anticipated at project appraisal that about 250 km of earth roads passable by motor vehicles would be built along six road alignments. However, changes were made following detailed road alignments surveys for all six road alignments and about 267 km of roads were constructed. At the time of the project completion review, about 200 km of the constructed roads were fully passable by motor vehicles, 29 km required minor finishing and boulder clearing, and 38 km is incomplete. Implementation difficulties in most of the incomplete sections were related to difficult terrain (in the form of vertical cliffs, unexcavated portions and streams) and security issues.

13. The project roads and structures were to be constructed following a labor-based environment-friendly and participatory (LEP) approach and standards. At the beginning of project implementation, road construction was rushed because of pressure from communities for physical outputs and connectivity. The quality of road construction and structures was compromised: mass-balancing was not always achieved, and cut-and-through (instead of cut-and-fill) and box-cutting were practiced in a few cases. This created difficulties in managing the surplus soil, some of which was disposed of inappropriately.

14. Local laborers were unskilled and generally lacked previous experience of road-building. The LEP approach to constructing roads requires labor to receive training on essential skills before construction starts. Technical supervisors need to be continuously present on-site to support and supervise the work. However, not enough field visits were made by the senior supervision consultant (engineer) and the monitoring by DIU engineer was inadequate, particularly during major work periods. This affected both work progress and quality. These

issues were addressed after engagement of the domestic consultants in association of local NGOs.

15. Detailed maintenance plans and mechanisms for rural roads were prepared for each participating district.¹⁰ Three sources of finance for maintenance were available at the district level: (i) grants from the central government, (ii) toll collection, and (iii) other revenues generated at the local level. Tolls from vehicles are expected to increase as the road traffic grows. This is a positive step in resource mobilization at the local level. Each district has opened a road maintenance account and each receives a grant from the central government for road construction and maintenance. Despite these efforts, operation and maintenance of roads is not undertaken systematically, because of skills shortages, weak capacity for maintenance, and strong political pressure for new construction. There is strong demand for the project roads, but DDCs and vehicle operators maintain them on an ad hoc basis.

16. **Construction of Village Multipurpose Buildings.** At appraisal, it was anticipated that 90 small multipurpose buildings would be built, 30 in each of the three project districts. However, only 31 buildings were completed in total. Of these, 22 buildings have been handed over to the respective village development committees (VDCs). The remaining 9 buildings have been damaged by insurgents and were not handed over because they were in need of major rehabilitation and maintenance. Labor groups also opposed the handing over as dues to them had not been paid.¹¹ Most of the constructed community buildings were inconveniently located as little consideration was given to the new road alignments.¹² This has limited their usefulness. Some community buildings are being used by DDCs, nongovernment organizations (NGO), and communities for meetings, training, and for the collection of agriculture products, despite their inconvenient locations. Buildings were not valued as highly as roads by most stakeholders.

17. **Awareness Campaign Program.** The awareness campaign envisioned by the Project comprised the production of campaign materials (including pamphlets, charts, photos, and videos) and an organizing campaign. At project appraisal it was envisaged that about 150 awareness campaigns for rural infrastructure development would be carried out. About 177 have been conducted. The awareness campaigns began later than anticipated, which meant that district road users' committees (DRUCs), local road users' committees (LRUCs), and labor groups were not fully aware of their roles, entitlements, or the wage payments process. Lack of clarity about the LEP approach led to poor quality of works, hidden contracts, and delayed payments to workers. Adequate attention was given to the awareness campaign after the midterm review, through the mobilization of district-based NGOs in association with a domestic consulting firm.

C. Project Costs

18. The project cost estimate at appraisal was \$16.9 million, including a foreign exchange component of \$2.2 million and a local cost component of \$14.7 million. The actual total costs amounted to about \$15.6 million, including \$0.2 million for a service charge during construction. ADB financed the entire foreign exchange cost (\$1.4 million) and part of the local currency cost (\$9.2 million equivalent). About 68% of the total cost of the project was financed by ADB, which is below the appraisal estimation of 72%. At loan closing, the unutilized balance of the ADB

¹⁰ The plans include an annual road maintenance plan, procedures for collection of funds, sources of funds and implementation arrangement.

¹¹ Work done by the labor groups was not included in design of the community buildings.

¹² For example, two buildings were constructed more than 30 km from road alignments.

loan, amounting to \$0.6 million, was cancelled. The project costs and financing arrangements projected at appraisal and actually incurred at project completion are shown in Appendix 3.

D. Disbursements

19. The appraisal disbursement schedule, which anticipated slow disbursements during the first year, was realistic. However, actual disbursements did not follow the schedule made at appraisal (Appendix 4). In 2003, disbursement decreased to \$0.2 million, as all civil works under the Project were suspended for about 20 months (para. 22). Disbursements for expenditure on civil works began after satisfactory implementation of corrective measures (para. 23) by the MLD. While the loan closing date was 30 September 2005, the loan account remained open until September 2006 to cover expenditures related to construction in a few sections of Baglung–Burtibang alignment and Khopasi–Taldhunga alignment. This could have been avoided if the project manager had not been transferred before the last 6 months of project implementation.

20. The project management office (PMO) established an imprest account with Nepal Rastra Bank. The initial account ceiling of \$0.5 million was subsequently increased to \$1.0 million. The total amount of replenishment was \$5 million. The imprest account was fully liquidated before the loan closing date. The statement of expenditure (SOE) procedure was also used and disbursement using the SOE procedure was \$8.4 million (78% of ADB disbursement under the Project). Because of the small amount of individual expenditures under the Project, the imprest account and SOE procedures were found to be very useful, and helped the PMO to ensure smooth project implementation.

21. There was a provision for retroactive financing, which meant that start-up activities could begin before loan effectiveness. Retroactive financing covered expenditures incurred in connection with (i) engagement of project consultants, (ii) improvement and rehabilitation of project central and field offices, and (iii) procurement of office equipment and furniture.

E. Project Schedule

22. The Project was originally envisaged to be implemented over 6 years with an estimated completion date of 31 December 2002. Appendix 5 compares the appraisal schedule with the actual project time frame. All civil works were suspended for about 20 months from October 2001 because of inadequate construction quality and deviation from the LEP approach.

23. Construction work was resumed after ensuring that implementation arrangements improved by (i) clearly prioritizing civil works; (ii) providing contract awards through local competitive bidding in addition to force account;¹³ (iii) emphasizing a phased approach, along with mechanisms to monitor the payments process for laborers; (iv) hiring a technical, social and financial audit consultant to ensure the remaining works were carried out according to the original project concept; (v) hiring supervision consultants to ensure the quality of civil works; (vi) hiring a benefit monitoring and evaluation consultant; and (vi) clarifying the roles and responsibilities of various actors. Based on the satisfactory completion of an action plan agreed with the October 2002 ADB mission and the MLD's strong commitment to the proposed

¹³ The force account works procedure is a procedure for reimbursing the borrower for expenditures in carrying out certain approved civil works required for the project. It is also applicable when the size, nature, and location of the works make competitive bidding unsuitable.

improvements to the implementation arrangements, the loan closing date was extended by 2 years from 30 June 2003 to 30 June 2005.

F. Implementation Arrangements

24. Overall, the implementation arrangements were adequate to deliver the project outputs and achieve the project outcome. Minor changes (paras. 34 and 35) in implementation arrangement were made after the midterm review mission, which helped to increase the project impact.

25. MLD was the EA and was responsible for overall project implementation. The PMO, headed by a project manager, was initially established at the central level within the technical unit of MLD. In 1997, the government established the Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) and the technical unit merged with it. An interministerial central project steering committee¹⁴ chaired by the secretary of MLD was established within 3 months of loan effectiveness. This functioned as a central coordination body. The committee ensured inter-ministerial coordination adequately and provided policy guidance at the central level. However, there was no similar mechanism at the district level, and the central committee was not effective in ensuring coordination at the district level.

26. A DIU was established in each participating DDC. It was envisaged that the DIU would be an integral part of DDC's technical division and that it would strengthen the technical capacity of the DDC to implement the Project. However, the project administration memorandum lacked clarity with respect to institutional roles and responsibilities at the project implementation level. It was also not clear whether the district consultant¹⁵ office (DCO) was to actually implement the project following the LEP approach with the DIU monitoring and supporting the implementation process or vice versa.

27. During the course of project implementation, DIUs were given full responsibility for project implementation, with technical support provided by the DCOs. Each DIU hired temporary staff for the project period. Responsibility for checking the quality of work supervised by the DIU technicians and for verifying the measurements and bills prepared by the DIU was given to the DCOs. This arrangement created conflict among DIU and DCO staff when the consulting body questioned the quality of work and accuracy of bill prepared by the regulatory body, i.e. DIU. As all DIU staff were temporary, there was no clear vision as to how the expertise and experience gained in the Project would be transferred to the DDC. The ambiguity was further complicated with the enactment of the Local Self Governance Act in 1999. The roles, responsibilities, authorities, and relationships of the DDCs' technical section, the DIUs, the local development officer (LDO), the district engineer and the DCO were very unclear. Nevertheless, despite these constraints the Project was able to substantially achieve its targets because of strong follow-up and support from the PMO.

28. At the field level two organizations were constituted: district road users' committees (DRUCs) and local road users' committees (LRUCs).¹⁶ For each road alignment there was one DRUC and several LRUCs. However, there was limited social awareness-raising, so in several cases local people were not sufficiently informed about the committees or mobilized to

¹⁴ Members included representatives of the National Planning Commission, MLD, Ministry of Finance, Ministry of Agriculture and cooperatives, Ministry of Forest and Soil Conservation, and Department of Roads. The project manager acted as the committee's secretary.

¹⁵ Engaged under the Project to assist DIUs and DDCs to implement the Project.

¹⁶ Committees entered into legally binding memoranda of agreement with DDCs on terms and conditions.

participate in them. Neither the people nor the members of the committees internalized the real implications of the DRUCs and LRUCs. Nor was it clear to whom the DRUCs and LRUCs were accountable. Because of these unclear roles and inadequate awareness campaigns, participation by local people was less than expected during the first 3 years of project implementation. However, the engagement of local NGOs increased their participation in the later part of the project period.

29. The Project emphasized road maintenance from the outset. Road maintenance activities were financed even before all road sections had been completed. This trained local laborers to maintain roads and imparted technical skills. ADB financing for maintenance declined as the Project progressed and there was no ADB financing for maintenance costs in its later stages. The priority of participating DDCs was usually completion of the construction of entire road alignments due to pressure from local people. Although the Project supported preparation of a maintenance plan and a mechanism to maintain roads, DDCs were usually not able to implement the plan fully or systematically (para. 15). Implementation of maintenance plans was further constrained by frequent changes in heads of DIUs and DDCs (para. 39).

30. The adverse security situation after the midterm review caused difficulties in implementing the Project. The Project faced more conflict-related difficulties in Kabhre than in Tanahun and Baglung. Adjustments were made at the field level¹⁷ and the project concept, implementation modalities, costs and disbursement procedures were made transparent with the help of local committees and NGOs. As there was strong demand for road access, the project was implemented despite the adverse security situation, although the pace was slow.

G. Conditions and Covenants

31. Conditions for loan effectiveness were complied with on time and the loan was declared effective 1 month after loan signing.

32. The covenants were broadly adequate to ensure sufficient control and quality of project implementation. The audited project accounts and auditor's report were submitted to ADB on time and in accordance with sound auditing standards. Of the 31 major loan covenants, 24 were complied with, 5 partly complied with, and 2 were complied with late (Appendix 6). Five covenants were only partly complied with because of: inadequate provision of suitable and experienced staff and resources for the district implementation unit; ad hoc control over the types and loads of vehicles on the relevant roads; weak introduction of the toll collection mechanism; and less than adequate collection of data for monitoring and evaluation of project activities and implementation, with a particular emphasis on socioeconomic, environmental and gender impacts. Compliance with two covenants was delayed because of the late fielding of the midterm review and submission of the borrower's project completion report was delayed by 10 months.

H. Consultant Recruitment and Procurement

33. MLD recruited international and national consultants in accordance with ADB's *Guidelines on the Use of Consultants*. The international consulting firm signed the contract on 21 March 1997, about 9 months¹⁸ later than planned. About seven contract variations were

¹⁷ Reformation of local road users' committees and district road users' committees; provision of compulsory site visits by local bidders; and sharing of project documents with local stakeholders.

¹⁸ The 9-month delay was due to slow decision-making at the EA.

made during the contract period of 8 years. The PMC's services were focused at the central level, which affected the effectiveness of implementation in the field (paras. 14 and 22). Following ADB's October 2002 review mission, the need for additional domestic consultants was identified to improve implementation. These included domestic consultant services for audit, benefits, monitoring and evaluation, and construction supervision. A domestic consulting firm in association with district-based NGOs was hired in November 2003 for construction supervision and social mobilization activities.

34. Five pickup vehicles, 36 motorcycles and three tractors with trailers were procured in different years following international shopping procedures. Fifty sets of survey and construction equipment were procured in different years following local competitive bidding or direct purchase procedures. Procurement of materials, equipment and tools was done by the PMO or DIU following local competitive bidding or direct procurement procedures. Construction of multipurpose community buildings was on the basis of local competitive bidding among local contractors.

35. Labor contracts for civil works under road construction were on a force account basis using local labor groups organized by the user committee (DRUC or LRUC) responsible for construction and maintenance of the relevant section of the road. This was to ensure that labor expenditure would go directly to the local people. However, because local labor was unskilled, some work in difficult terrain either remained partially completed or was poorly or slowly done. Implementation arrangements were revised after the suspension of the project. Under the new arrangements, each DIU or DDC hired local contractors through local competitive bidding for works that were beyond the capacity of labor groups or that required skills such as hard-rock cutting and structure works. Local labor gained skills by working with these local contractors.

36. Payments to laborers under the force account were based on measuring a completed piece of road and subsequent certification by the site supervision team. Laborers were not familiar with this method and were therefore uncertain about how much they would earn. Certification by the site supervision team took time because of the site supervisors' workload, geographical constraints, and the adverse security situation in many field locations. Administrative procedures and a lack of responsiveness toward the needs of the laborers also held up payments. Although the guideline was for payments to be made every 2 weeks, this was not achieved. A system of payment based on measurement (without any advance payment) was perceived as unsuitable by local laborers, who preferred a daily wage system because it was simple and certain. A public auditing system was adopted for road construction activities and this was regarded by local people as an excellent and transparent approach.

I. Performance of Consultants, Contractors, and Suppliers

37. The performance of consultants, contractors, and suppliers was satisfactory. The use of a domestic consultant in association with district-based NGOs for construction supervision and social mobilization was more effective than the original international consultant joint venture with a local consultant. When the domestic consultant and NGOs worked as a team there was better coordination in the awareness campaign, social mobilization, and other activities. The NGOs' social mobilization activities helped to raise confidence in project activities. This enabled them to be implemented despite the adverse security situation.

J. Performance of the Borrower and the Executing Agency

38. The performance of the borrower and the EA in carrying out the responsibilities assigned to them was satisfactory. The Project was categorized as a core project by the Government throughout implementation, which ensured it received an adequate budget. The assessment of the EA's capacity at appraisal was reasonably accurate. The capacities of DOLIDAR and the DIUs increased during the project period. The start-up actions, including establishment of the project management office, district implementation units, and staffing were satisfactory. The Government provided suitable qualified and experienced staff, resources and support facilities for the PMO.

39. DOLIDAR through its PMO coordinated the project activities well and provided support to participating districts so they could implement subprojects successfully. Participating DDCs, village development committees (VDCs), and local people had no prior experience in constructing roads and obviously lacked skills. New institutional arrangements (labor groups, DRUCs and LRUCs) were introduced through the Project. DIUs, with the support of consultants in the districts, managed to complete most of the Project. However, delivery was adversely affected by (i) frequent transfers of the DIU chief (local development officer)¹⁹ and (ii) lack of clarity in the line of command and accountability. The local development officer (LDO) was also the acting DDC chairperson and was therefore preoccupied with political issues.

40. The Project received threats from insurgents during 2002–2005. Demands that construction work should stop caused some difficulties but, with support from DRUCs, the Project was able to achieve the envisaged outputs within the project period. The project team (EA staff, supervision consultant, and local NGOs) played a proactive role, working closely with DRUCs and LRUCs, and maintaining an informal dialogue with the insurgents. The DRUCs played a key role in convincing the insurgents' leaders that the local people benefited from off-farm employment because of the labor-intensive road construction. The DRUCs also assured insurgents that there would not be any threat to them because of the project activities. The project team expended significant effort on creating an enabling environment for smooth project implementation, even during the conflict.

K. Performance of the Asian Development Bank

41. Overall, ADB's performance was considered satisfactory. ADB fielded 17 missions, including one project inception mission, one midterm review mission, two special loan administration missions, and one project completion mission. ADB missions were mostly centered on project inputs; the physical progress of the project, including contract awards and disbursements; and implementation delays. Each mission provided a time-bound action plan that could be readily monitored. ADB was flexible and agreed to a number of adjustments to overcome problems that had arisen as a result of changing circumstances. ADB agreed to a 2-year extension of the loan closing date because of the 20-month project suspension and the insurgency. However, it may have been better if ADB had suspended the work in particular districts, rather than suspending the whole project. ADB provided adequate staff time for missions and field supervision.

¹⁹ Eight times in Tanahun; eight times in Kabhre; and eleven times in Baglung during the project period of 9 years.

III. EVALUATION OF PERFORMANCE

A. Relevance

42. The project design and formulation was consistent with the Government's development strategy and ADB's country strategy and program at the time of approval as well as completion. The Government's Eight Plan, Ninth Plan (FY1997–FY2002) and Tenth Plan (FY2003–FY2007) accorded high priority to fostering broad-based growth based on the revival of agriculture by improving rural transport links and increasing access of farmers to agriculture inputs and markets. ADB's country strategy and program (2005–2009)²⁰ emphasizes assisting the Government of Nepal to (i) achieve sustained poverty reduction through broad-based growth in the development of rural areas, and (ii) improve the access of the poor to basic services, opportunities for economic advancement, and participation in development project. Overall, the Project is rated relevant.

B. Effectiveness in Achieving Outcome

43. The Project was effective in delivering its intended outcomes, although implementation was delayed by 2 years. It helped to improve access to remote villages; raise the socioeconomic standards of the local people; and protect the fragile ecological conditions in the hill region (Appendix 1). The total number of beneficiaries of the road network and other support services was 183,789 (Appendix 7) against an appraisal estimate of 200,000. The number of beneficiaries was smaller than anticipated because of out-migration caused by the adverse security situation in all three project districts.

44. After road construction, transport patterns changed. Light vehicles such as tractors, jeeps, and minibuses replaced mules and porters. The rural poor have benefited from better access to social services, including hospitals and health posts. Access to hospitals (for child-delivery, treatment following accidents, and other emergency situations) is faster and easier. The cost of transportation has been reduced by as much as 75%, and travel time to markets and services has decreased by up to 50%. However, project roads are often closed during the monsoon period as they are made of earth and require frequent maintenance.

45. As the roads were constructed using highly labor-intensive methods, the Project generated unskilled and skilled employment for local poor people (about 4.2 million person-days, against an appraisal estimate of 4.0 million person-days). New economic activities on the road corridors have already emerged. This included the emergence of new buildings and the development of such enterprises as tea and snacks stalls, automobile repair shops, and other retail shops. Longer-term off-farm employment opportunities for local people were created, including maintaining existing roads, building new roads, driving vehicles, and working in automobile workshops. About 67% of the project investment remained within the local economy. A proxy indicator of money injected into local economy is the substantial increase in the number of corrugated-iron roof-houses in the area influenced by the Project.

46. All local stakeholders put a higher emphasis on tangible outputs than on the social mobilization and awareness campaign, which took place after road construction. This affected the effectiveness and usefulness of the social mobilization. Labor groups were formed hastily, and beneficiaries were not fully aware of the LEP approach and procedures. In summary, local people (particularly the targeted poor people) were not well prepared to participate and benefit

²⁰ ADB. 2004. *Country Strategy and Program (2005–2009): Nepal*. Manila.

from the construction activities. The amount of time and the inputs required for the social mobilization and awareness campaign were underestimated, which affected the campaign's effectiveness.

C. Efficiency in Achieving Outcome and Outputs

47. Quantifiable benefits expected at appraisal—including transport cost savings and higher net incremental values of agricultural and livestock production—are being achieved. The overall economic internal rate of return (EIRR) on the basis of cost and benefit streams for the Project is estimated to be about 20%, against the appraisal estimate of 13% (Appendix 8). The higher EIRR is because of the higher net incremental values of agricultural and livestock production due to improved access to the project area and lower project costs compared with the appraisal estimates. There are other benefits (paras. 53 to 61) that are not included in the EIRR calculation.

48. The construction of community buildings was less efficient than the construction of roads. It is difficult to determine whether any significant benefits have been derived from this component as most buildings are not yet fully functional (as of April 2006). The project appraisal did not quantify the benefits from community buildings, but benefits would have been produced if the buildings had been constructed in appropriate locations for marketing of agricultural produce.

D. Preliminary Assessment of Sustainability

49. The overall sustainability of the Project is rated likely. The sustainability of the project roads is considered likely. There is strong community demand for the roads built under the project. Local communities actively participated through LRUCs and labor groups in the planning, construction and maintenance of the roads. Despite the tense security situation in all the three districts, the roads were constructed because all communities regarded them as important.

50. The community buildings seem less sustainable unless local institutions, including village development committees (VDCs), take meaningful ownership of them. Although the buildings were handed over to VDCs, their capacity and resources to maintain them is questionable. They are not being maintained or used optimally to enhance village community activities. DDCs and VDCs do not have policies or budgetary allocations for the repair and maintenance of the buildings. Community demand for the buildings is low because they were not built near road alignments and their design was less than optimal.

51. Coordination and collaboration among LRUCs, labor groups, and VDCs is poor. The VDCs have not elected representatives or secretaries for almost 5 years because of political problems. This has limited the support they can give to the LRUCs and labor groups in constructing and maintaining roads and community buildings. Links need to be established between project outputs and local institutions if the benefits are to be sustained.

E. Impact

52. The expected impact of the Project was to reduce the poverty incidence among the rural population in the hill region. The project completion review mission found that 52% of the farmers in the project districts held less than 0.5 ha of land (and were thus defined as "marginal farmers" in the project design). This pattern is consistent with farmers in the areas influenced by

the roads. The Project provided local employment and cash was injected into the local economy through wages earned during construction. Access to other economic activities was improved.

53. The Project benefited 29,573 households (a total population of 183,789) in Kavre, Tanahu, and Baglung districts. Most of the beneficiary households were engaged in agriculture. The project area covered about 35,919 ha of agricultural land. Field level discussions and published data suggest that, in the area of influence of the Project in Kavre, Tanahu and Baglung districts, there was an overall increase of about 20% in cropping intensity at the full development stage of the Project. The Project established useful road links between the farms and market centers and facilitated the flow of goods (both inputs and outputs) and services. Land acquisition and resettlement was not an issue. Because demand for the road was high, land was contributed on a voluntary basis.

(i) Environmental Impact

54. There was no major negative environment impact as the roads did not pass through any environmentally sensitive areas. Implementation was based on the LEP approach. An initial environmental examination was carried out at the time of project design which found that the Project's environmental impact on forest cover would be negligible. No further study was considered necessary. The main environmental issues during implementation were caused by inadequate mass balancing and inappropriate disposal of excavated materials, the routing of road alignments through local forests, uncontrolled quarrying, and slope instabilities. In constructing the hill roads, it was extremely difficult to avoid all unstable areas and at the same time to satisfy technical and social criteria while selecting the alignment. Although parts of the project roads pass through local forests, the impact was not very significant. The communities that used the forest and district forest offices were consulted and appropriate measures were taken.

55. In the initial stage of implementation, mass balancing through the construction of retaining walls was not considered. Inadequate mass balancing and inappropriate disposal of excavated excess materials arose because these issues were not adequately considered during the fixing of the road-center line. The provision for waste-tipping areas in the design was inadequate, as was site supervision during excavation. The stakeholders did not fully understand the significance of this important aspect, although disposal of waste did improve during the later part of the project implementation.

56. There was a general lack of environmental monitoring after road construction. Random quarrying of roadside slopes to collect stones for structural works is being done, which is undesirable from environmental point of view as it can destabilize slopes. As all the roads are earth, dust generation will become a significant issue as the amount of traffic increases, as dust is created by even by the small number of vehicles currently plying the roads.

(ii) Sociocultural and Other Impacts

57. Overall, female participation in road construction increased after the midterm review from 11% in 1999 to 25% in 2005 against the appraisal target of 20%. The roads built by the Project have (i) reduced the burden on women carrying heavy loads of goods, agricultural inputs, and other household necessities; and (ii) provided cash through wages, which has been spent on education of children, family health care, and essentials such as food, oil, and clothes.

58. The formation of institutions such as DRUCs, LRUCs, and labor groups helped to form leadership and management skills among local people. The continuous social, technical, and financial audits during the project extension period helped to raise awareness of transparency measures. Local communities became more empowered and capable.

59. Many of the people who worked in the construction of the roads acquired skills, for example in masonry (construction of dry-stone walls, gabion structures, and simple cross-drainage structures). These skills have enabled them to find other employment. Small businesses such as shops and tea stalls have increased since the road was built (although it is believed that many of these are owned by more well-off people).

60. The employment of local poor people during construction was temporary. Although some workers developed skills that could be used in other projects or in maintenance of the road, the livelihoods of most of the very poor people did not improve after construction had been completed. A package approach needs to be employed for very poor remote communities, integrating income generation and local development activities with road construction.

61. Subsequent rural road projects in Nepal have benefited from the Project's experiences. The Decentralized Rural Infrastructure and Livelihood Project (funded by ADB), the Rural Access Program (funded by DFID), the District Road Support Program (funded by the Swiss Agency for Development Corporation), and the Rural Access Improvement and Development Project (funded by the World Bank) have all adapted some aspects of the LEP approach. Implementation of the Project helped to build confidence that LEP projects could be managed by Nepalese.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

62. Overall, the Project is rated successful.²¹ This indicates that the design and implementation was acceptable and the Project had more or less the development impact anticipated at appraisal. The Project was consistent with the Government's development priorities at approval and at completion. The Project was more efficient than envisaged at appraisal as the EIRR was 20% (the appraisal target was 13%). The sustainability of the project is rated likely. There is strong demand for project outputs, particularly for the roads.

B. Lessons

63. Construction of roads following the LEP approach should not be rushed. Time is needed to inform the local laborers about the approach and for all concerned to gain some on-site LEP experience. The initial construction stage should emphasize capacity building and should establish practical procedures for doing things properly and not just concentrate on achieving quantitative outputs (para. 13).

64. Construction of roads using the LEP approach requires a high level of site supervision to ensure quality standards and to support and guide labor groups. Provisions should be made for the continuous presence of trained supervisors on the site for timely measurement of completed works and timely payment (para. 14).

²¹ This project completion report (PCR) is part of a sample of PCRs independently reviewed by Operations Evaluation Department. The review has validated the methodology used and the rating given.

65. The roles and responsibilities of institutions and other stakeholders involved in the planning, implementation, and post-implementation of the Project should be clearly explained and agreed with concerned agencies while the Project is being designed in order to avoid confusion and conflicts (para. 26). Local institutions and offices should be given full authority for implementation of community-based rural infrastructure.

66. With regard to community-based rural infrastructure projects, the implementation team should be responsive, flexible, and capable of changing the project scope to address communities' priorities if necessary (para. 11).

67. Social mobilization should be conducted before the LRUC and the labor group are formed, so workers are fully aware of how work is measured and wages paid. The social mobilization process should be given much more emphasis and sufficient time should be allowed for it to take place (paras. 17 and 27).

68. A simplified procedure for approval and payment should be established and put into operation before any construction starts. Laborers must be paid daily or at least once every 15 days. This could be done as advance payment to laborers based on the attendance and daily rates to be cleared after completion of pieces of work (para. 36).

69. Maintenance of roads needs to be considered from the planning phase to the post-construction phase. Commitments need to be monitored against indicator(s)²² during the implementation stage, so that a reliable mechanism to carry out operation and maintenance after construction can be put in place (para. 29).

70. Public auditing is an excellent approach for ensuring financial transparency (para. 36).

71. A package approach needs to be used for poverty reduction. Income generation and local development activities need to be integrated with road construction, taking road construction as an entry point for poverty alleviation (paras. 40 and 59).

72. Despite the existence of conflict, development work is possible if community participation is high and the Project is seen to be addressing urgent needs. The Project illustrated that, if the project is transparent and has the effective participation of local people, activities can be implemented even in armed conflicts. The engagement of local NGOs can ensure that local people are better informed and mobilized (paras. 28 and 30).

C. Recommendations

73. About 38 km of the Kamidanda–Taldhunga section in Kabhre is incomplete in a number of sections. The Baglung–Burtibang alignment requires surface finishing in some completed sections and about 2 km is incomplete in a number of sections. MLD should prioritize the completion of these outstanding works (para. 12).

74. Each district has a road maintenance plan. The Government should provide adequate matching grants every year to districts so these plans can be implemented (provided the DDC is strongly committed to maintaining the roads). The Government should monitor the performance of road maintenance against indicators agreed with the DDC (paras. 15 and 29).

²² Creation of a maintenance fund, preparation and ownership of a maintenance plan, creation of an institutional framework for maintenance, and implementation of the maintenance plan.

75. Community buildings destroyed in the insurgency should be rehabilitated, and clear plans for their use should be prepared. DOLIDAR has agreed to review the status of community buildings and will prepare clear plans, including budget requirements, so these buildings can be properly used (para. 50).

76. Concerned VDCs should take responsibility for maintaining community buildings within their areas of influence. An adequate budget should be allocated by each VDC for operation and maintenance of facilities, based on the DOLIDAR recommendations for each fiscal year. This needs to be monitored by the DDC (paras. 16 and 50).

77. Concerned DDCs should give priority to the gradual upgrading of projects roads to all weather standards based on the traffic volume for their sustainable use throughout the year. They should also take measures to mitigate dust pollution (paras. 44 and 56).

DESIGN AND MONITORING FRAMEWORK¹

Design Summary	Performance Indicators/Target		Project Monitoring Mechanism	Assumptions/Risk
	Appraisal	Actual		
1. Impact				
1.1 Reduction in absolute poverty	Reduction in transportation costs	Achieved and ongoing. The cost of transportation has decreased by as much as 75%, and travel time to markets and services decreased by up to 50%.	Project baseline information Project review missions Project progress reports Midterm review Project completion review	<p>Assumptions</p> <p>Active participation of project beneficiaries</p> <p>Use of the labor-based approach to construction and maintenance of rural roads</p> <p>Government commitment to rural development in the hill region</p> <p>Increased awareness among local population about project benefits</p> <p>Close working relationship between local institutions and the Ministry of Local Development</p> <p>Risks</p> <p>Loss of Government commitment at central or local levels</p> <p>Frequent transfers and high attrition of local engineers</p>
	Reduction in the level of underemployment in villages during the dry season	Project generated unskilled and skilled employment for local poor people (about 4.2 million person-days employment against an appraisal estimate of 4.0 million person-days). New economic activities on the road sides have been introduced. Longer-term off-farm employment opportunity for local people was created for planned and routine maintenance, driving vehicles and working in automobile workshops.		

¹ A new design and monitoring framework has been formulated by the project completion review mission based on the original project framework.

Design Summary	Performance Indicators/Target		Project Monitoring Mechanism	Assumptions/Risk
	Appraisal	Actual		
2. Outcome				
2.1 Socioeconomic development in the hill region	EIRR of 12.7% for the Project	Achieved. The overall EIRR is estimated at about 20%.		
	Increase in marketable surplus from villages	Achieved and ongoing. Light vehicles such as tractors, jeeps, and minibuses have replaced traditional means of transport (mules and porters). This has led to a decrease in the price of salt, fertilizers, and other materials.		
	Reduction in prices of salt, fertilizer, kerosene oil, and other materials			
	Changes in women's activities	Achieved. Practical benefits accrued by women included better livelihood options, increased income at women's disposal, and time savings due to the proximity of forage and fodder. Increased income was spent on essentials such as food, oil, clothes, education, and family health care.		
	Improved access to social services	Achieved and ongoing. Project is effective in delivering its intended outcomes with 2 years of implementation delays. The total number of beneficiaries benefited by the project through improved access to a road network passable by road vehicles and other support services was 183,789, against an appraisal estimate of 200,000. The reduction in the number could be because of out-migration due to the adverse security situation in all three project districts. Increased access to basic services such as health and education. Reduce travel time to schools.		

Design Summary	Performance Indicators/Target		Project Monitoring Mechanism	Assumptions/Risk
	Appraisal	Actual		
2.2 Protection of fragile ecological conditions in the hill region	<p>Incidence of erosion and landslides</p> <p>Extent of vegetative cover and forests</p>	<p>Planting of soil stabilizing plants such as bamboo along the sides of the project roads has been promoted. The Project Completion Review Mission observed that the project roads have a satisfactory level of vegetative covers on both sides of the road. These crops have visibly helped to stabilize the slopes beside the road. Products such as bamboo, for example, are used for the construction of houses and animal sheds as needed.</p>		
3. Outputs				
3.1 Rural Roads and Structure Development				
Construction and improvement of rural roads and structures including culverts and causeways	<p>Rural roads at village and district levels, Total length of 251 km along six road alignments</p> <p>Baglung District (126 km) Tanahun District (65 km) Kabhre District (60 km)</p>	<p>Baglung District (123 km) Tanahun District (86.34 km) Kabhre District (22 km)</p> <p>There were some changes to the target during the implementation period based on the detailed road alignments survey for all six road alignments. About 267 km of roads were built, against the target of 250 km. About 200 km of roads are fully passable by motor vehicles and 28 km require stone clearing in a few places and minor finishing. The rest of the road length (39 km) is incomplete in Kabhre district because of bottlenecks in the form of vertical cliffs, unexcavated portions and streams.</p>		
Maintenance of rural roads and	Preparation of maintenance	A detailed maintenance plan for		

Design Summary	Performance Indicators/Target		Project Monitoring Mechanism	Assumptions/Risk
	Appraisal	Actual		
structures established under the Project	plans for rural infrastructure developed under the Project, construction of other critical structures in the project districts	rural roads and structures was prepared for each participating district. Tolls from vehicles were being collected in all three project districts for routine and periodic maintenance. These tolls are expected to increase as the road traffic grows.		
3.2 Village-level development support				
Construction and rehabilitation of village buildings	Small community buildings in about 90 VDCs in three project districts	30 community buildings were built. Construction of rural roads and structures received a much higher priority from DDCs than community buildings. Community buildings were constructed in widely scattered locations, without adequate consideration being paid to road alignments and local markets.		
3.3 Awareness campaigns for rural infrastructure development				
Increased public awareness	Higher degree of people's participation in self-help community development and environmental management	An awareness campaign was started quite late, together with the construction of the roads. About 177 awareness and orientation programs have been undertaken.		
Institutionalization and dissemination of labor-based and environment-friendly approach to rural road construction and maintenance	Other districts in the hill region to launch on the development of rural roads and structures paying due consideration to labor-intensive methods and environment protection			

<p>Activities</p> <p>Project Support</p> <ol style="list-style-type: none"> Selection and engagement of consultant services Procurement of civil works, vehicles and equipment Provision for operation and maintenance Provision of incremental project staff Project BME activities <p>Development of rural roads and Structures:</p> <ol style="list-style-type: none"> Establishment and registration of local road users committees Project orientation Survey, design and work estimate Road construction and improvement work Bio-engineering and revegetation measures <p>Awareness campaign for rural infrastructure development</p> <ol style="list-style-type: none"> Workshops and seminars on the experience of the labor-based and environment-friendly approach to rural road construction Preparation of campaign materials Development of technical manuals for design, construction and maintenance with labor-based and environment-friendly approaches 	<p>Inputs</p> <p>At Appraisal</p> <p>Government : \$3.9 million Beneficiaries: 0.8 million ADB: 12.2 million Total: \$16.9 million</p> <p>Actual</p> <p>Government : \$4.0 million Beneficiaries: 0.8 million ADB: 10.8 million Total: \$15.6 million</p>
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ADB = Asian Development Bank, BME = benefit, monitoring and evaluation, DDCs = district development committees, EIRR = economic internal rate of return, km = kilo meters, VDCs = village development committees

Project Outputs

Table A2.1: Status of Road Alignments

SN	Road Alignment	Length of Road (km)		Remarks
		Appraisal Target	Achieved	
A. Kabhre District				
1.	Khopasi—Taldhunga	60	22	Survey and design was carried out for 62 km. Construction was carried out from two points: Khopasi and Taldhunga. The road is passable by motor vehicles up to Kamidanda (22 km) from Khopasi. The rest of the road length (38 km) is not passable by motor vehicles due to bottlenecks in form of vertical cliffs, unexcavated portions and streams.
B. Tanahau District				
2.	Bhimad—Chihandanda	59 Not planned	86.34 5.70	Passable by motor vehicles. This section was previously constructed by DDC. It was included so the hairpin bends and the gradient of the road could be improved to avoid accidents and to follow the standard design criteria of the Project.
3.	Chihandanda—Baidi	23	32.70	This section has two subsections: Chandanda—Deorali and Deorali—Baidi. A slab culvert was constructed to cover the irrigation canal at Baidi. This was supervised by the district implementation unit staff directly as the consultants had to leave earlier than scheduled because of security concerns.
4.	Belbhanjyang—Deurali	13	12.60	Passable by motor vehicles.
5.	Bhimad—Dhakardi	Not planned	13.00	Passable by motor vehicles. This approach road was included on the request of DDCs.
6.	Dhakardi—Bhirkot	23	22.34	Passable by motor vehicles.
C. Baglung District				
7.	Baglung—Burtibang	126	123	
	Baglung—Galkot Haitya	105	101	Passable by motor vehicles. Minor finishing is required.
	Galkot Haitya—Kharbang	55	55	About 200 m section uncompleted. Major finishing is required.
	Kharbang—Burtibang	20	20	Kharbang—Bhimgitte (16 km) passable by motor vehicles. Partially completed Bhimgitte-Burtibang section. Major finishing is required.
8.	Baglung—Kusmisera	30	26	Passable by motor vehicles with minor finishing works required.

DDCs = district development committees, km = kilometer

Table A.2.2: Multipurpose Community Buildings

SN	Districts	Anticipated	Completed	Remarks
1.	Baglung	30	10	Three buildings have been handed over to the village development committees. The remaining seven require maintenance. The village development committees have refused to take over until maintenance has been completed.
2.	Tanahau	30	9	Eight buildings have been handed over to respective village development committees and one is being used by a DDC.
3.	Kabhre	30	12	All have been handed over to village development committees, except for one in Madanbas.
Total		90	31	

DDC = district development committee.

Project Costs
(\$)

Descriptions	ADB		Government		Beneficiaries		Total	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual
Civil Works	5,034,000	7,732,797	2,330,000	3,745,858	827,000	800,000	8,191,000	12,278,655
Institutional Development	375,000	122,487	94,000	30,622			469,000	153,109
Equipment	1,900,000	191,510	494,000				2,394,000	191,510
Materials	1,901,000	71,905	484,000	58,831			2,385,000	130,736
Consulting Services	1,736,000	2,078,649					1,736,000	2,078,649
Incremental Operating Cost	915,000	309,774	447,000	166,801			1,362,000	476,575
BME Expenses	73,000	18,415	18,000	4,604			91,000	23,019
Service Charge	266,000	244,160					266,000	244,160
Total Cost	12,200,000	10,769,697	3,867,000	4,006,716	827,000	800,000	16,894,000	15,576,413

Source: Project Completion Review Mission, ADB.

ADB = Asian Development Bank.

Yearly and Quarterly Disbursements

Table A4.1: Yearly Disbursements
(\$)

Category	Description	Years										Total
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
01	Civil Works-Construction	100,000	418,616	818,281	1,915,792	2,123,764	568,433	45,157	412,748	955,247	115,691	7,473,729
02	Civil Works-Maintenance	3,066		47,326	142,206	66,449	21					259,068
03	Institutional Development		9,970	11,996	35,569	21,671	35,222	8,059				122,487
04	Equipment	1,062	104,566	62,082	22,004	1,784	12					191,510
05	Materials	2,991	13,394	8,060	18,466	23,893	5,101					71,905
06	Consulting Services	329,725	180,796	184,316	227,659	195,961	330,564	140,813	267,713	181,785	39,317	2,078,649
07	Incremental Operating Costs	9,064	25,896	21,029	44,799	48,769	100,236		34,175	25,806		309,774
08	BME Expenses								10,289	5,039	663	18,415
09	Service Charge		7,327	15,688	33,757	49,429	75,215	62,744				244,160
Total		445,908	760,565	1,168,778	2,440,252	2,531,720	1,117,228	256,773	724,925	1,167,877	155,671	10,769,697

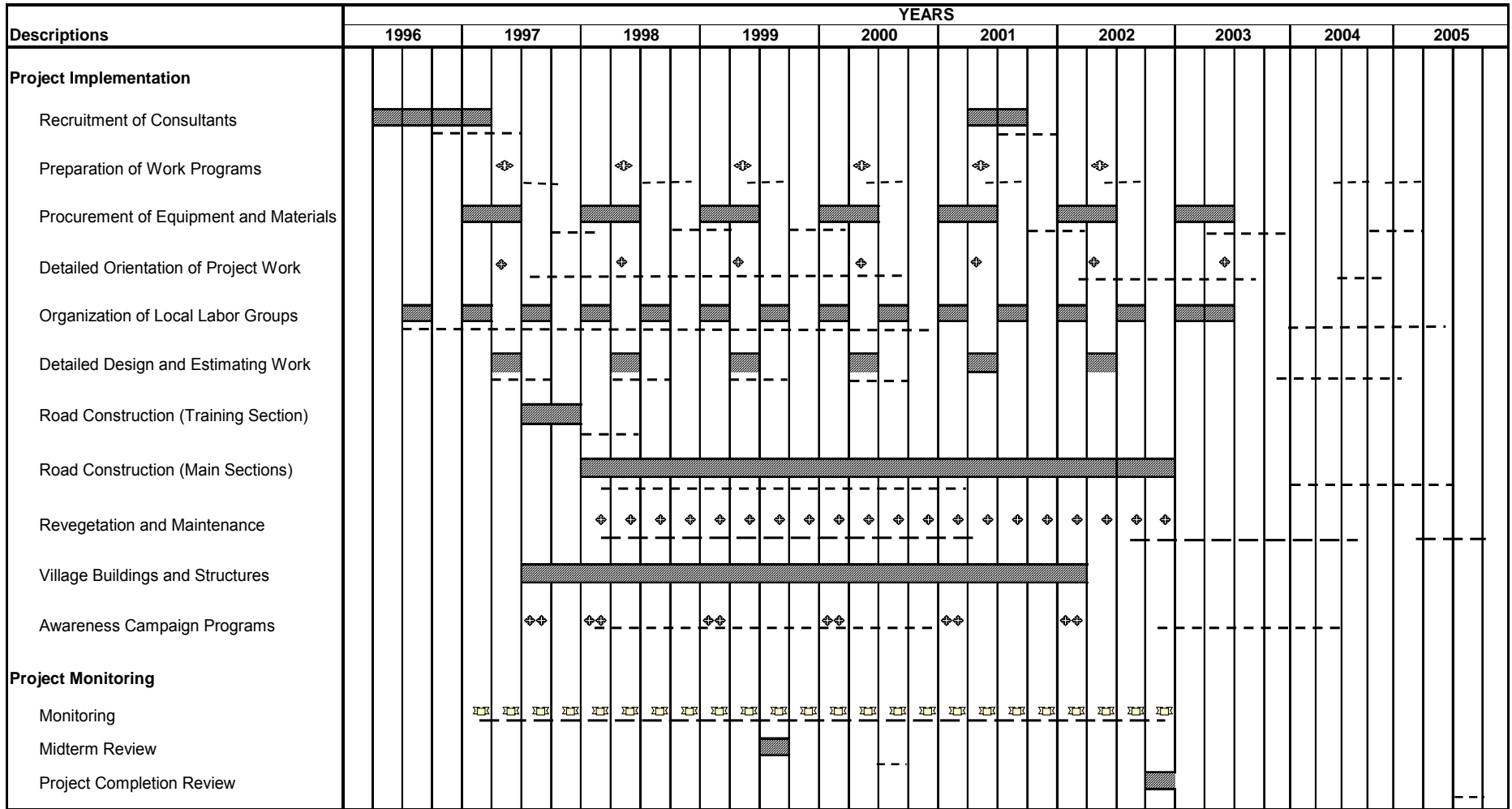
Source: Loan Financial Information System, Asian Development Bank.

Table A4.2: Quarterly Disbursements
(\$ million)

Year	Quarter	Actual Disbursements	Actual Cumulative	Cumulative Percentage of Actual Disbursements
1997	I	0.100	0.100	0.939
	II	0.073	0.173	1.625
	III	0.165	0.338	3.175
	IV	0.107	0.445	4.180
1998	I	0.021	0.466	4.378
	II	0.263	0.729	6.848
	III	0.097	0.826	7.760
	IV	0.380	1.206	11.329
1999	I	0.087	1.293	12.147
	II	0.551	1.844	17.323
	III	0.456	2.300	21.606
	IV	0.074	2.374	22.302
2000	I	0.752	3.126	29.366
	II	0.249	3.375	31.705
	III	0.787	4.162	39.098
	IV	0.652	4.814	45.223
2001	I	0.147	4.961	46.604
	II	0.797	5.758	54.091
	III	0.758	6.516	61.212
	IV	0.830	7.346	69.009
2002	I	0.549	7.895	74.166
	II	0.283	8.178	76.825
	III	0.000	8.178	76.825
	IV	0.285	8.463	79.502
2003	I	0.000	8.463	79.502
	II	0.159	8.622	80.996
	III	0.080	8.702	81.747
	IV	0.018	8.720	81.916
2004	I	0.045	8.765	82.339
	II	0.114	8.879	83.410
	III	0.094	8.973	84.293
	IV	0.472	9.445	88.727
2005	I	0.095	9.540	89.620
	II	0.155	9.695	90.700
	III	0.883	10.578	98.995
	IV	0.035	10.613	99.324
2006	I	0.031	10.644	99.615
	II	0.000	10.644	99.615
	III	0.156	10.769	100.000
Total		10.769		

Source: Loan Financial Information Systems, Asian Development Bank.

Project Implementation Schedule



Legend: Planned  Actual: - - - - -

Status of Compliance with Loan Covenants

Covenant	Reference in Loan Agreement	Status of Compliance
1. Borrower shall make available, promptly as needed, the funds, facilities, services, land and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project and for the maintenance of the project facilities.	Section 4.02	Complied with.
2. The Borrower shall cause competent and qualified consultants and contractors, acceptable to the Borrower and the ADB, to be employed to an extent and upon terms and conditions satisfactory to the Borrower and the ADB.	Section 4.03 (a)	Complied with.
3. The Borrower shall ensure that the activities of its departments and agencies with respect to facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	Section 4.04	Complied with.
4. The Borrower shall make arrangements satisfactory to the ADB for insurance of equipment and vehicles financed out of the proceeds of the Loan to such extent and against such risks and in such amounts as shall be consistent with sound practice.	Section 4.05 (a)	Complied with.
5. The Borrower shall maintain, or cause to be maintained, records and accounts adequate to identify the goods and services and other items of expenditure financed out of the proceeds of the Loan, to disclose the use thereof in the Project, to record the progress of the Project and to reflect, in accordance with consistently maintained sound accounting principles, the operations and financial condition of the agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof.	Section 4.06 (a)	Complied with.
6. The Borrower shall (i) maintain, or cause to be maintained, separate accounts for the Project; (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to the ADB; (iii) furnish to the ADB, as soon as available but in any event not later than 12 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto, all in the English language; and (iv) furnish to the ADB such other information concerning such accounts and financial statements and the audit thereof as the ADB shall from time to time reasonable	Section 4.06 (b)	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
request.		
7. The Borrower shall enable the ADB, upon the ADB's request, to discuss the ADB's financial statements for the Project and its financial affairs related to the Project from time to time with the ADB's auditors, and shall authorize and require any representative of such auditors to participate in any such discussion shall be conducted only in the presence of an authorized officer of the ADB unless the Borrower shall otherwise agree.	Section 4.06 (c)	Complied with.
8. The Borrower shall furnish, or cause to be furnished, to the ADB all such reports and information as the ADB shall reasonably request concerning (i) the Loan, the expenditure of the proceeds and maintenance of the service thereof; (ii) the goods and services and other items of expenditure financed out of the proceeds of the Loan; (iii) the Project; (iv) the administration, operations and financial condition of the agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof; (v) financial and economic conditions in the territory of the Borrower and the international balance-of-payments position of the Borrower; and (vi) any other matters relating to the purposes of the Loan.	Section 4.07 (a)	Complied with.
9. The Borrower shall furnish, or cause to be furnished, to the ADB reports at the end of each four-month period, on the carrying out of the Project and on the operation and management of the Project facilities. Such reports shall be submitted in such form and in such detail and within such a period as the ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the period under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following period.	Section 4.07 (b)	Complied with.
10. Promptly after physical completion of the Project, but in any event not later than 3 months thereafter or such later date as may be agreed for this purpose between the Borrower and the ADB, the Borrower shall prepare and furnish to the ADB a report, in such form and in such detail as the ADB shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by the Borrower of its obligations under the Loan Agreement and the accomplishment of the purpose of the Loan.	Section 4.07 (c)	Delayed complied with.
11. The Borrower shall enable the ADB's representative to inspect the Project, the goods financed out of the proceeds of the Loan, and any	Section 4.08	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
relevant records and documents.		
12. The Borrower shall ensure that the Project facilities are maintained and repaired in accordance with sound administrative, financial, engineering, environmental, and maintenance practices.	Section 4.09	Partly complied with. Project facilities are partly maintained.
13. No withdrawals from the Loan Account shall be made in respect of any local taxes.	Schedule 3, para. 2	Complied with.
14. The Borrower shall establish, immediately after the Effective Date, an imprest account at Nepal Rastra Bank. The imprest account shall be established, managed, replenished and liquidated in accordance with the ADB's "Guidelines on Imprest Fund and Statement of Expenditures Procedures" dated November 1996, as amended from time to time, and detailed arrangements agreed upon between the Borrower and the ADB. The initial amount to be deposited into the imprest account shall not exceed the equivalent of \$500,000.	Schedule 3, para 8 (a)	Complied with.
15. Withdrawals from the Loan Account may be made for reimbursement of reasonable expenditures incurred under the Project before the Effective Date, but not earlier than 10 March 1996, in connection with (i) engagement of Project Consultants for preconstruction preparatory activities; (ii) improvement and rehabilitation of Project central and field offices; and (iii) procurement of office equipment and furniture, subject to a maximum equivalent to \$300,000.	Schedule 3, para. 9	Complied with.
19. Percentage of ADB financing for maintenance of civil works will be decreased by 10% each year during the Project period, commencing at 80% for the second year; 70% for the third year; 60% for the fourth year; and 50% for the fifth year; and 40% for the sixth year of project implementation.	Schedule 3 para 11	Complied with.
20. Provision of suitably qualified and experienced staff, resources and support facilities for the project management office. Transfer of key personnel involved in project activities, including the project manager, local development officers and district engineers, will take place only in extraordinary circumstances.	Schedule 6 para 2	Partly complied with. The government provided suitable qualified and experienced staff, resources and support facilities for the project management office. However, at the district level, local development officers were transferred frequently (7 times in Tanahun, 11 times in Baglung and 8 times in Kabhre) during 9 years of project period.
21. Establishment of district implementation unit in its	Schedule 6	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>respective district responsible for the day-to-day management of project activities and formulation and preparation of annual work programs. Each district implementation unit will be headed by the Local Development Officer assigned to the relevant district and will be staffed with an engineer, two overseers, accountant and necessary supporting staff.</p>	para 3	
<p>22. Establishment of interministerial central project steering committee, to be chaired by the secretary of the Ministry of Local Development, which will include representatives from the National Planning Commission, Ministry of Local Development, Ministry of Finance, Ministry of Agriculture and Cooperatives, Ministry of Forest and Soil Conservation and the Department of Roads. Project Management Office's Project Manager will serve a Central Project Steering Committee's Secretary.</p>	Schedule para 5 6	Complied with.
<p>23. Each district implementation unit, with the assistance from the Project consultants will prepare specific annual budgetary allocations and other measures to ensure adequate local resource mobilization for approval by concerned District Council. These budgetary allocation and other measures will ensure adequate financing for the maintenance of the project facilities by concerned District Development Committees and Village Development Committees within those jurisdiction the project facilities to be constructed under parts A and B of the project will be located.</p>	Schedule para 6 (i) 6	Complied with.
<p>24. Establishment of a user committee for each of the six roads to be constructed under part A of the Project. Each user committee will include representative from concerned households and village development committees along each specific road, and will elect a Chairperson, Vice Chairperson and Secretary from among its members. Each User committee will form local labor groups to carry out road construction and will provide opportunity for full participation by project beneficiaries in construction of the relevant road. User committee will also be primarily responsible for road maintenance in their respective jurisdictions. Ministry of Local Development will ensure that each user committee will (i) adhere to working procedures acceptable to the Borrower and the ADB, (ii) enter into legally binding memorandum of agreement with the concerned District Development Committees on terms and conditions, and in accordance with procedures acceptable to the ADB (iii) ensure that at least 70% of the labor force for construction and maintenance of each road under the project originates from those areas</p>	Schedule para 4 6	Complied with. Until the midterm review, there was low participation by local laborers, including female workers. This is mainly because the social mobilization work was started quite late after the construction works.

Covenant	Reference in Loan Agreement	Status of Compliance
through which the relevant road to be constructed under the Project will pass; and (iv) arrange recruitment of local female laborers so that at least 20% of the labor force recruited by each user committee under the project will constitute female laborers.		
25. No withdrawals shall be made from the Loan Account for construction of any particular roads) within a specific district under part A of the Project unless and (i) until the concerned District Development Committee shall have entered into Memorandum of Agreements, in form and substance and in accordance with procedures satisfactory to the ADB, with all user committees in such district responsible under part A of the project construction of the relevant roads(s) within such district; and (ii) the said Memorandum of Agreements have been fully executed and delivered on behalf of the relevant District Development Committee and User Committee(s) within such district and have become fully effective and binding upon both parties in accordance with the terms thereof.	Schedule para 4 6	Complied with.
26. Appropriate measures are taken by concerned user committees and District Development Committees to control types and load of vehicles on the relevant road(s) prior to opening of such road(s) to traffic, in order to prevent use of the road(s) by unsuitable vehicles such as trucks, buses and other heavy traffic or during monsoon seasons.	Schedule para 6 (ii) 6	Partly complied with. Each district has a policy to prevent heavy vehicles. However, implementation of the policy is weak.
27. A toll collection mechanism will be introduced and approved by the district council of each District Development Committee, whereby toll collection will be contracted out to local residents in order to fund maintenance of the relevant road(s) constructed under the Project within the jurisdiction of such District Development Committee.	Schedule para 6 (iii) 6	Partly complied with. The mechanism has been properly developed to use collected funds for maintenance work.
28. A District Overseer in each district implementation unit shall be responsible for collecting data and information for monitoring and evaluation of project activities and implementation, with particular emphasis on socioeconomic, environmental and gender impacts. Such data and information collection and related monitoring shall be in accordance with Consultants, based on the ADB's Handbook on Benefit Monitoring and Evaluation.	Schedule para 7 6	Partly complied with. Data and information have been collected by the districts, primarily on project activities. There is less emphasis on socioeconomic, environmental, and gender impacts. During the later part of project implementation, a benefit monitoring and evaluation consultant was engaged.
29. The Borrower shall use its best efforts to avoid land acquisition, consequent resettlement, by adjusting	Schedule para 8 (a) 6	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
the design and alignment of the Project roads or by accepting narrower road width, or both.		
30. If resettlement is required under the Project, the Borrower shall ensure that such resettlement is in accordance with (i) the Nepal Land Acquisition Act, 1977; and (ii) the ADB's Policy on Involuntary Resettlement. The Borrower shall agree with the ADB on a resettlement action plan, and necessary procedures to carry out such plan, and promptly and efficiently implement the agreed resettlement action plan. Borrower shall ensure that all persons who are relocated as a consequence of the Project shall be generally at least as well off as they would have been without implementation of the Project.	Schedule para 8 (b) 6	Complied with. There was no problem with resettlement.
31. If land acquisition to implement the Project cannot be avoided, the Borrower shall ensure that all necessary land, properties rights in land and rights-of-way required for construction under the Project are promptly made available to ensure timely project implementation.	Schedule para 9 6	Complied with.
32. Final determination of road alignments will be resolved within a reasonable period in order to ensure timely execution of Part A of the Project, and proposals for material changes or modifications to designated road alignments under the Project will be subject to prior review and approval by the ADB, after full consideration by the Project Consultants of all technical, environmental and social impacts of such	Schedule para 10 6	Complied with. There have been cases of alignment disputes where people requested changes. A few of these requests have been considered and studied by the consultants and approved by ADB. Disputes were resolved through discussions and participation by concerned parties.
33. A mid term review will be jointly undertaken (by the Borrower and the ADB) with terms of reference and timing to be agreed between the Borrower and the ADB, including an open workshop to assess project scope, progress, implementation arrangements and impacts.	Schedule para 11 6	Complied with late. The midterm review was undertaken in September 2000, a year late.
34. Construction of the roads under Part A of the Project will be based on environment-friendly approaches, including appropriate use of natural compaction, gabion walls, natural vegetation for slope reinforcement and protection, bamboo terracing, and replanting of trees in areas where tree – loss is unavoidable, side – casting of earth and waste materials will be avoided. Environmental monitoring will be undertaken by the Project Executing Agencies periodically to ensure that adverse environmental impact of any type is avoided.	Schedule para 12 6	Complied with.

BENEFICIARY HOUSEHOLDS AND AGRICULTURAL AREA, 1996 AND 2005

Item		Project Districts			Total
		Kavre	Tanahu	Baglung	
Beneficiary Households (no)	RRP-1996	NA	NA	NA	NA
	PCR – 2005	5,143	9,390	15,040	29,573
Beneficiary Population (no)	RRP-1996	NA	NA	NA	NA
	PCR – 2005	28,801	66,856	88,132	183,789
Total Cultivated Area (ha)	RRP – 1996	5,442	15,179	14,550	35,171
	PCR – 2005	5,431	16,039	14,449	35,919
Total Cropped Area (ha)	RRP – 1996	9,556	32,266	17,414	59,236
	PCR – 2005	9,874	38,053	19,491	67,418
Cropping Intensity (%)	RRP – 1996	176	213	120	168
	PCR – 2005	182	237	135	188

Source: Final Benefit Monitoring Evaluation Report, September 2005.

% = percentage, ha = hector, no = number, NA = not available, PCR = project completion review, RRP = Report and Recommendation to President,

ECONOMIC ANALYSIS

A. Method of Analysis

1. The methodology used to carry out an economic analysis of the Project during the Project Completion Review Mission closely follows that used during appraisal. The economic analysis has been carried out in accordance with ADB's *Guidelines for Economic Analysis of Projects*. The analysis is based on quantifiable costs and benefits generated from the rural road component of the Project. The quantitative evaluation has been supplemented by qualitative assessments of project benefits where quantifications were not possible.
2. The trails and tracks improved under the Project were used previously by foot passengers, porters, and mule caravans. Following the Project, the traffic pattern has now changed and jeeps, mini-trucks, and mini-buses are plying the roads. Remote villages have been linked to major market centers. The economic evaluation of the Project has tried to capture this by assessing the Project in terms of (i) incremental benefits generated from increased agricultural and livestock production and marketing, and (ii) expected savings in transportation costs caused by changes in the mode of transportation.
3. Project benefits such as increased agricultural and livestock production and marketing, and savings in transportation costs due to changes in the mode of transportation, were assessed based on data available in the reports of the project's benefits, monitoring, and evaluation (BME) consultant; reports published by government and nongovernment offices at the center and in the districts; the consultant's discussions with concerned government and nongovernment officials and the project beneficiaries; and the consultant's observations during field visits in Baglung, Tanahu and Kavre districts.
4. This quantitative assessment of benefits has been supplemented by examining the qualitative benefits of the Project—mostly social benefits—due to the construction of roads that are passable by motor vehicles and the better connections between villages and district townships and market centers.

B. Major Assumptions

1. Economic Life of the Project

5. Implementation of the Project began in 1997 and formally closed in June 2005. According to the report and recommendation of the president²⁴ (RRP), the Project was scheduled to be completed in a span of 6 years. For the purpose of economic analysis, the implementation period of the Project is taken to be 9 years.
6. According to the RRP, the economic life of the project facilities, including rural roads and road structures, is considered to be 20 years (before major rehabilitation is required). For the purpose of this analysis, 2006 was taken as the first year of fully developed project facilities.

²⁴ ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Kingdom of Nepal for the Rural Infrastructure Development Project*. Manila.

2. Prices

7. All the prices, benefits and costs were based on 2005 constant prices. The analysis used data and information collected in the field and in reports (para. 3). Information was verified with project beneficiaries during field visits in the project areas. The economic prices of major tradable commodities, both outputs and inputs (such as rice, maize, wheat, urea, diammonium phosphate, and potash), were derived from the World Bank's commodity price projections published in Global Economic Prospects and adjustments were done using the G-5 manufacturer's unit value (MUV) index. Details of the derivation of economic prices of tradable outputs and inputs are given in Supplementary Appendix 1.

8. For the purpose of economic analysis, all local costs were standardized using a standard conversion factor of 0.9. This was in line with the approach at appraisal. As in the RRP, a conversion factor of 0.82 was used for civil works and transportation costs incurred during construction. This conversion factor was chosen because of the large percentage of unskilled labor and portering in civil works and transportation during the road construction period.

9. An exchange rate of US\$1 = NRs.73 was taken as the average exchange rate for 2005 and has been used to convert amounts expressed in Nepali rupees into US dollars. A discount rate of 12% was used to calculate the net present value (NPV) and as a cut-off point for the economic internal rate of return (EIRR). The economic analysis excluded any taxes, duties, price contingencies and subsidies from the benefit and cost items of the Project. It was assumed that general inflation would affect both input and output prices at the same rate. The financial and economic prices of major outputs and inputs are presented in Table A8.1.

Table A8.1: Financial and Economic Prices of Major Inputs and Outputs in the Project Area

Item	Unit	Financial Price (NRs)	Conversion Factor	Economic Price (NRs)
Project Inputs				
Unskilled Labor	Person-day	100.00	0.80	80.00
Skilled Labor	Person-day	180.00	1.00	180.00
Construction materials	-	-	0.82	-
Agricultural Inputs				
Seed				
Rice	Kg	16.50	1.55	25.56
Maize	Kg	23.50	1.49	35.00
Wheat	Kg	21.00	1.58	33.20
Fertilizer				
Urea	Kg	16.00	2.02	32.40
DAP	Kg	21.00	1.80	37.90
Potash	Kg	15.00	2.01	30.20
Labor				
Farm Labor	Person-day	100.00	0.80	80.00
Draft Animal	Pair-day	160.00	0.90	144.00

Item	Unit	Financial Price (NRs)	Conversion Factor	Economic Price (NRs)
Agricultural/Livestock Outputs				
Rice	Kg	9.90	1.55	15.35
Maize	Kg	10.50	1.49	15.65
Wheat	Kg	11.10	1.58	17.54

Kg = kilogram, NRs = nepalese rupees

Source: project completion review mission, Asian Development Bank.

3. Project Costs and Benefits

10. The project costs used in the economic analysis included (i) the construction costs of rural roads and structures; (ii) annual and periodic maintenance costs; (iii) a portion of construction and maintenance costs (about 10%) for village buildings; and (iv) other costs for group motivation and project support.

11. The quantifiable benefits under the Project incorporated in the economic analysis are (i) net incremental values of agricultural and livestock production, and (ii) savings in transportation costs. As envisaged in the RRP, these benefits will be realized at the rate of 40% in the first year of a road alignment, 60% in the second year, 80% in the third year, and 100% from the fourth year onwards.

C. The Project Benefits

1. Impact on Agriculture and Livestock Production

12. Most project beneficiaries earn their living from farming and livestock-raising. About 91% of the households in the Project's area of influence (AOI) are engaged in agriculture and associated activities. Following the classification of farmers by land size in the RRP, about 96% of the farmers in the project districts belong to the marginal and small categories (Table A8.2). The project roads have largely benefited the smallholders living in the interiors of the districts.

Table A8.2: Percentage of Holdings and Share of Area by Categories of Farmers in the Project Districts

Farmer Classification ^a	Kavre		Tanahu		Baglung	
	Holdings (% of total)	Area (% of land)	Holdings (% of total)	Area (% of land)	Holdings (% of total)	Area (% of land)
Marginal (up to 0.5 ha)	45.91	19.49	56.10	26.49	53.07	19.50
Small (0.5–2.0 ha)	50.44	65.86	42.62	67.90	41.16	56.58
Medium (2.0–4.0 ha)	3.19	11.40	1.29	5.61	5.17	19.53
Large (above 4.0 ha)	0.46	3.25	0.00	0.00	0.60	4.40

^a Farmer classifications are based on the norms used during project appraisal, 1996. Classification used in appraisal: Marginal=Land holding up to 0.5 ha; Small=0.51 - 2.00 ha; Medium=2.01 - 4.00 ha; Large= above 4.01 ha
Source: National Sample Census of Agriculture 2001/02, Central Bureau of Statistics, HMG, 2004.

13. In the AOI, 67,418 ha are dedicated to the cultivation of different crops. The principal crops are rice, maize, wheat, millet, buckwheat, potato, pulses, oilseeds, and vegetables. The

farmers also grow a few fruit trees, mainly for domestic consumption. Some better-off farmers are engaged in commercial fruit farming and the principal fruits include oranges, bananas, lemons, peaches, guavas, and pineapples. Raising poultry and a few cows, buffaloes, and goats is also common. Farmers with smaller land holdings tend to concentrate on smaller birds and animals (e.g., goats).

14. Livestock plays an important role in the farming system. Livestock products—particularly milk, meat, and eggs—are an important source of cash income for small farmers while many larger farmers practice commercial livestock farming. According to the project beneficiaries, the rearing of livestock and trading of livestock products have increased in the AOI since the construction of the project roads.

15. Data from various sources were used to quantify the impact of rural road development in terms of changes in agricultural production, including the Project's BME reports; annual reports of the District Agricultural Development Office (DADO) in the project districts; the Project's RRP and background reports; and the project completion review consultant's official discussions, field investigations, and verifications. These sources were used to estimate the cropping patterns, areas, production, and yields of major crops grown, and the production from poultry birds and livestock in the AOI. The average financial cost of cultivation and the returns from major agricultural commodities in a 1-ha farm in the project area is given in Table A8.3. The production cost of maize and wheat has increased considerably since the beginning of the Project because of the increase in inputs (fertilizer and quality seeds), allowing these crops to be commercially farmed.

Table A8.3: Principal Crops Grown in the Project Area and Average Financial Costs and Returns per Hectare (NRs)

Crops	Without Project			With Project			Net Incremental Benefit
	Cost	Revenue	Net Benefit	Cost	Revenue	Net Benefit	
Paddy	24,615	27,050	2,435	24,143	30,420	6,277	3,842
Maize	19,955	21,105	1,150	21,180	24,150	2,970	1,820
Wheat	18,685	21,270	2,585	21,573	25,600	4,027	1,442
Pulses	14,520	26,600	12,080	10,520	27,360	16,840	4,760
Oilseeds	10,640	28,980	18,340	10,940	31,050	20,110	1,770
Potato	58,300	109,000	50,700	55,593	119,900	64,307	13,607
Vegetables	42,200	117,840	75,640	43,096	138,240	95,144	19,504
Millet	9,760	10,305	545	9,970	10,890	920	375
Buckwheat	12,330	13,500	1,170	12,430	14,000	1,570	400

Source: Published data of the Ministry of Agriculture and Cooperatives, Government of Nepal and field discussions.

2. Savings in Transportation Costs

16. Before the Project, mules and porters were the only modes of transportation for goods in the project area. Transporting goods from one place to other was, therefore, a time-consuming and strenuous job. The project roads have changed transportation patterns and jeeps, mini-trucks, tractors with trailers, minibuses, and motorcycles now operate in the AOI. This has made transportation of goods easier and more efficient.

17. Field investigations suggested that the average cost of transportation had decreased from as much as NRs8/kg using porters and NRs5-6/kg using mules, to NRs2/kg using mini-trucks and tractors, a benefit to the local economy. The benefits accruing from reductions in transport cost of fertilizers brought into the AOI and agricultural produce transported from the project area have been excluded from the calculations, as an increase in agricultural production is partly due to reduction in the transportation costs. Further, as in the RRP, it is assumed that to the opening of roads passable by motor vehicles, has increased movement of miscellaneous goods by 1% per annum. The projected savings in transport costs in the project area are given in Table A8.4.

3. Vegetative Cover on Roadsides

18. The Project promoted the planting of soil-stabilizing plants such as bamboo along the sides of the project roads. During field visits, the consultants observed satisfactory levels of vegetative covers on both sides of the road. These crops have helped stabilize the slopes along the road. The local people reported that they did not sell these crops, although products such as bamboo were used for the construction of houses and animal sheds.

4. Employment Creation

19. The project roads were constructed using highly labor-intensive methods. During the construction period, an estimated 4.2 million person-days were consumed in road construction works in the three districts. The project roads have induced new economic activities on the roadsides, including construction of new buildings and development of businesses such as tea and snacks stalls, automobile repair shops, and various other shops. In Baglung, for example, the number of automobile workshops increased from two in 2001 to six in 2006. With the completion of the Baglung–Burtibang road, 7 dealers and 20 retailers have started supplying cooking gas. In the first 8 months of road usage, about 150 cylinders per month were sold. The forward and backward linkages of these activities have created jobs in and around the project areas and improved the quality of life of the project beneficiaries.

Table A8.4: Projected Savings in Transportation Cost due to Project Intervention

Year	Goods Transaction (mt)			Without Project Transportation Cost			With Project Transportation Cost			Net Saving (NRs)			Total Net Saving NRs.
	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	
Base Year (2005)	3,621	10,295	12,326	10,864,244	30,884,046	36,978,704	7,242,829	20,589,364	24,652,469	3,621,415	10,294,682	12,326,235	26,242,331
2006	3,658	10,398	12,449	10,972,886	31,192,887	37,348,491	7,315,257	20,795,258	24,898,994	3,657,629	10,397,629	12,449,497	26,504,755
2007	3,694	10,502	12,574	11,082,615	31,504,815	37,721,976	7,388,410	21,003,210	25,147,984	3,694,205	10,501,605	12,573,992	26,769,802
2008	3,731	10,607	12,700	11,193,441	31,819,864	38,099,196	7,462,294	21,213,242	25,399,464	3,731,147	10,606,621	12,699,732	27,037,500
2009	3,768	10,713	12,827	11,305,376	32,138,062	38,480,188	7,536,917	21,425,375	25,653,459	3,768,459	10,712,687	12,826,729	27,307,875
2010	3,806	10,820	12,955	11,418,429	32,459,443	38,864,990	7,612,286	21,639,629	25,909,993	3,806,143	10,819,814	12,954,997	27,580,954
2011	3,844	10,928	13,085	11,532,614	32,784,037	39,253,640	7,688,409	21,856,025	26,169,093	3,844,205	10,928,012	13,084,547	27,856,764
2012	3,883	11,037	13,215	11,647,940	33,111,878	39,646,176	7,765,293	22,074,585	26,430,784	3,882,647	11,037,293	13,215,392	28,135,331
2013	3,921	11,148	13,348	11,764,419	33,442,996	40,042,638	7,842,946	22,295,331	26,695,092	3,921,473	11,147,665	13,347,546	28,416,684
2014	3,961	11,259	13,481	11,882,063	33,777,426	40,443,064	7,921,376	22,518,284	26,962,043	3,960,688	11,259,142	13,481,021	28,700,851
2015	4,000	11,372	13,616	12,000,884	34,115,201	40,847,495	8,000,589	22,743,467	27,231,663	4,000,295	11,371,734	13,615,832	28,987,860
2016	4,040	11,485	13,752	12,120,893	34,456,353	41,255,970	8,080,595	22,970,902	27,503,980	4,040,298	11,485,451	13,751,990	29,277,738
2017	4,081	11,600	13,890	12,242,102	34,800,916	41,668,529	8,161,401	23,200,611	27,779,020	4,080,701	11,600,305	13,889,510	29,570,516
2018	4,122	11,716	14,028	12,364,523	35,148,925	42,085,215	8,243,015	23,432,617	28,056,810	4,121,508	11,716,308	14,028,405	29,866,221
2019	4,163	11,833	14,169	12,488,168	35,500,415	42,506,067	8,325,445	23,666,943	28,337,378	4,162,723	11,833,472	14,168,689	30,164,883
2020	4,204	11,952	14,310	12,613,050	35,855,419	42,931,128	8,408,700	23,903,612	28,620,752	4,204,350	11,951,806	14,310,376	30,466,532
2021	4,246	12,071	14,453	12,739,180	36,213,973	43,360,439	8,492,787	24,142,649	28,906,959	4,246,393	12,071,324	14,453,480	30,771,197
2022	4,289	12,192	14,598	12,866,572	36,576,113	43,794,043	8,577,715	24,384,075	29,196,029	4,288,857	12,192,038	14,598,014	31,078,909
2023	4,332	12,314	14,744	12,995,238	36,941,874	44,231,984	8,663,492	24,627,916	29,487,989	4,331,746	12,313,958	14,743,995	31,389,698

Year	Goods Transaction (mt)			Without Project Transportation Cost			With Project Transportation Cost			Net Saving (NRs)			Total Net Saving NRs.
	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	Kavre	Tanahun	Baglung	
2024	4,375	12,437	14,891	13,125,190	37,311,292	44,674,303	8,750,127	24,874,195	29,782,869	4,375,063	12,437,097	14,891,434	31,703,595
2025	4,419	12,561	15,040	13,256,442	37,684,405	45,121,047	8,837,628	25,122,937	30,080,698	4,418,814	12,561,468	15,040,349	32,020,631

Source: project completion review mission, Asian Development Bank

20. Any loss of employment by porters due to the construction of project roads has been compensated for by the greater mobility of people and their access to new opportunities in other locations. Project beneficiaries who have learned skills, for example masonry or making gabion walls, during construction have often found employment carrying out similar activities in other areas. According to the chairperson of the District Road Users' Committee in Tanahu, about 150 workers who developed skills in making gabions and dry walls are often engaged in activities relating to irrigation and soil conservation.

5. Social Benefits

21. The Project has made it easier for beneficiaries to visit distant health services. For example, the Project beneficiaries in Baglung reported that they could now reach Pokhara for medical urgencies and consultations in 1 day (compared with 2 days before the road). Beneficiaries in Tanahu and Kavre also reported considerable time savings (e.g., 1 day's journey on foot from Bhimad to Baidi has been reduced to 3 hours by jeep). The roads have also led to some improvement in access to education.

D. Results of Analysis

22. The RRP prepared in May 1996 argued that the Project would be economically viable and the project completion review confirmed this assessment. The EIRR over the 20-year economic life of the project is estimated to be about 20% (Table A8.5), compared with 12.7% estimated in the RRP. The increase is because of the higher net incremental value of agricultural and livestock production because of improved access to the project area and the fact that the cost of the Project was lower than at appraisal.

23. The results of the economic analysis carried out during the project completion review mission are presented in Table A8.5. Sensitivity tests were run and compared with the results in the RRP. The results were fairly satisfactory. The Project's EIRRs under different scenarios were well above 12%, the opportunity cost of capital assumed for this analysis. The lowest EIRR was 18.9% when production benefits were reduced by 10% and the assumed annual growth of 1% in goods transacted in the Project roads was ignored. As indicated by the sensitivity indicators in Table A8.6, the sensitivity of the Project to all the adverse conditions imposed is fairly low.

Table A8.5: Economic Analysis

SN	Fiscal Year	Total Loan (\$)	Government & Farmers' Cost (\$)	Total Investment (\$)	O&M Cost of Civil Works ^a (\$)	Total Costs (\$)	Net incremental Benefits from increased agriculture and livestock	Benefits from Saving in Transportation cost	Total Incremental Benefits (\$)	Incremental Financial Cash Flow (\$)
1	1997	393,072	494,108	887,180		887,180				(887,180)
2	1998	651,019	494,108	1,145,127		1,145,127				(1,145,127)
3	1999	982,652	494,108	1,476,759		1,476,759				(1,476,759)
4	2000	2,031,423	494,108	2,525,531		2,525,531				(2,525,531)
5	2001	2,103,495	494,108	2,597,602		2,597,602				(2,597,602)
6	2002	957,847	494,108	1,451,955		1,451,955				(1,451,955)
7	2003	227,483	494,108	721,591		721,591				(721,591)
8	2004	619,413	494,108	1,113,520		1,113,520				(1,113,520)
9	2005	1,003,001	494,108	1,497,108		1,497,108				(1,497,108)
10	2006				56,112	56,112	2,931,717	308,617	3,240,334	3,184,223
11	2007				56,112	56,112	4,397,576	311,703	4,709,279	4,653,168
12	2008				56,112	56,112	5,863,435	314,820	6,178,255	6,122,143
13	2009				56,112	56,112	7,329,294	317,968	7,647,262	7,591,150
14	2010				56,112	56,112	7,329,294	321,148	7,650,442	7,594,330
15	2011				68,485	68,485	7,329,294	324,360	7,653,653	7,585,168
16	2012				68,485	68,485	7,329,294	327,603	7,656,897	7,588,412
17	2013				68,485	68,485	7,329,294	330,879	7,660,173	7,591,688
18	2014				68,485	68,485	7,329,294	334,188	7,663,482	7,594,997
19	2015				68,485	68,485	7,329,294	337,530	7,666,823	7,598,338
20	2016				70,197	70,197	7,329,294	340,905	7,670,199	7,600,002
21	2017				70,197	70,197	7,329,294	344,314	7,673,608	7,603,411
22	2018				70,197	70,197	7,329,294	347,757	7,677,051	7,606,854
23	2019				70,197	70,197	7,329,294	351,235	7,680,528	7,610,331
24	2020				70,197	70,197	7,329,294	354,747	7,684,041	7,613,844
25	2021				71,952	71,952	7,329,294	358,295	7,687,588	7,615,636
26	2022				71,952	71,952	7,329,294	361,878	7,691,171	7,619,219
27	2023				71,952	71,952	7,329,294	365,496	7,694,790	7,622,838
28	2024				71,952	71,952	7,329,294	369,151	7,698,445	7,626,493
29	2025				71,952	71,952	7,329,294	372,843	7,702,136	7,630,184
									NPV @ 12% US\$	9,934,012
									EIRR =	20%

^a O&M of Civil Works rising 0.5% of total investment in every 5 years.

Table A8.6: Results of Economic Analysis and Sensitivity Tests

Assumptions	RRP 1996		PCR 2006	
	EIRR (%)	Sensitivity Indicator ^a	EIRR (%)	Sensitivity Indicator ^a
1. Base case	12.7		20.10	-
2. No growth in flow of goods	12.3		19.98	-
3. 10% reduction in production benefits	11.4	1.024	18.95	0.572
4. Combination of (2) and (3)	10.9	1.417	18.91	0.592
5. 10% reduction in transport cost savings	12.1	0.472	19.96	0.070

EIRR=economic internal rate of return, PCR=project completion report, RRP = report and recommendation of the President.

^a Sensitivity Indicator = % change in EIRR / % change in the variable.

^b For the base case, the annual increase in the inflow of goods in the Project area is assumed to be 1%.

Source: project completion review mission, ADB.