

ASIAN DEVELOPMENT BANK

PCR: NEP 19187

PROJECT COMPLETION REPORT

ON THE

UPPER SAGARMATHA AGRICULTURAL DEVELOPMENT PROJECT

(Loan 1114-NEP [SF])

IN

NEPAL

November 2004

CURRENCY EQUIVALENTS

Currency Unit – Nepalese rupee/s (NRe/NRs)

		At Appraisal	At Project Completion
		September 1991	June 2002
NRe1.00	=	\$0.0234	\$0.0133
\$1.00	=	NRs42.7	NRs75.0

ABBREVIATIONS

ADB	–	Asian Development Bank
ADBN	–	Agricultural Development Bank of Nepal
ASC	–	agriculture service center
CMP	–	community mobilization program
CRCMC	–	center road coordination and monitoring committee
DADO	–	District Agriculture Development Office
DDC	–	district development committee
DLSO	–	District Livestock Service Office
DOR	–	Department of Roads
DWD	–	Department of Women Development
DRCMC	–	district road coordination and monitoring committee
EFR	–	environment friendly road
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
FY	–	fiscal year
JDEFRR	–	Jayaramghat Diktel Environment Friendly Road
MLD	–	Ministry of Local Development
MOAC	–	Ministry of Agriculture and Cooperatives
NGO	–	nongovernment organization
OPEFR	–	Okhaldhunga Phaplu Environment Friendly Road
OWA	–	overall weighted average
PCO	–	project coordination office
PCR	–	project completion report
PFO	–	project field office
PIU	–	project implementation unit
PMO	–	project management office
SDR	–	special drawing rates
SIDS	–	surveying, investigating, designing, and supervising
TA	–	technical assistance
VDC	–	village development committee
VRMC	–	village road coordination and monitoring committee
WDS	–	Women Development Section

WEIGHTS AND MEASURES

t	–	metric ton
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NOTES

- (i) The fiscal year (FY) of the Government ends on 15 July. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2005 ends on 15 July 2005.
- (ii) In this report, "\$" refers to US dollars.

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- B. Details of Project Rating
- C. Achievements of Quantitative Targets.

BASIC DATA

A. Loan Identification

1.	Country	Nepal
2.	Loan Number	1114-NEP
3.	Project Title	Upper Sagarmatha Agricultural Development Project
4.	Borrower	Nepal
5.	Executing Agencies	Ministry of Agriculture and Cooperatives Ministry of Local Development Ministry of Works and Transport
6.	Amount of Loan	SDR9,774,000
7.	Project Completion Report Number	PCR: NEP799

B. Loan Data

1.	Appraisal – Date Started	March 1991
2.	Loan Negotiations – Date Started	30 September 1991
3.	Date of Board Approval	31 October 1991
4.	Date of Loan Agreement	14 January 1992
5.	Date of Loan Effectiveness – In Loan Agreement – Actual	14 May 1992 5 May 1992
6.	Closing Date – In Loan Agreement – Actual – Number of Extensions	30 June 2000 30 June 2002 1
7.	Terms of Loan – Interest Rate – Maturity (number of years) – Grace Period (number of years)	1% per annum 40 10

8. Disbursements a. Dates

Initial Disbursement	Final Disbursement	Time Interval
1 December 1993	20 December 2002	109 months
Effective Date	Original Closing Date	Time Interval
5 May 1992	30 June 2000	98 months

b. Amount (SDR '000)

Category	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
Production Support						
Crop Production Support						
Civil Works	275	577	302	577	433	144
Transport Equipment and Supplies	800	83	(717)	83	76	7
Fertilizer Distribution	3,702	997	(2,705)	997	712	285
Incremental Cost of Office Supplies	66	381	315	381	334	47
Incremental Cost of Salaries	53	0	(53)	0	0	0
Livestock Production Support						
Civil Works	160	436	276	436	375	62
Transport Equipment and Supplies	647	98	(549)	98	84	14
Incremental Cost of Office Supplies	26	344	318	344	308	36
Transportation of Fodder Seed	19	0	(19)	0	0	0
Incremental Cost of Salaries	15	0	(15)	0	0	0
Women In Development						
Transport Equipment and Supplies	209	277	68	277	249	28
Incremental Cost of Salaries	147	34	(113)	34	32	2
Hill Transport Infrastructure						
Civil Works	1,765	4,944	3,179	4,944	4,969	(25)
Transport Equipment and Supplies	207	144	(63)	144	106	38
Incremental Cost of Salaries	315	41	(274)	41	40	1
Project Management Support						
Transport Equipment and Supplies	142	262	120	262	301	(39)
Incremental Cost of Salaries	91	31	(60)	31	29	2
Service Charge During Construction	288	290	2	290	238	52
Unallocated	847	91	(756)	91	0	0
Total	9,774	9,030	(744)	9,030	8,284	745

9.	Local Costs (Financed)	
-	Amount (\$ '000)	7,218
-	Percent of Local Costs	58
-	Percent of Total Cost	44

C. Project Data

1. Project Cost (\$ '000)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	5,364	3,970
Local Currency Cost	12,826	12,387
Total	18,190	16,357

2. Financing Plan (\$ '000)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	1,100	752
ADB-Financed	12,870	10,873
Participating Banks ^a	3,470	4,015
Beneficiaries	360	401
Total	17,800	16,041
IDC Costs		
Borrower-Financed	0	0
ADB-Financed	390	316
Total	18,190	16,357

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

^a Agriculture Development Bank, Nepal Bank Limited, and Rastriya Banijaya Bank.

3. Cost Breakdown by Project Component (\$ '000)

Component	Appraisal Estimate	Actual
I. Production Support Component		
A. Crop Production Support	7,821	2,347
B. Livestock Production Support	1,513	1,132
C. Women's Development	703	358
D. Credit	3,828	4,417
Subtotal (I)	13,865	8,254
II. Improvement of Hill Transport Infrastructure		
A. Improvement of Trails	1,578	5,241
B. Construction of Bridges	1,022	1,735
C. Transport, Equipment, and Civil Works	375	156
D. Recurrent Expenditure	452	58
Subtotal (II)	3,427	7,190
III. Project Management Support		
A. Transport and Equipment	234	451
B. Incremental Salaries	272	146
Subtotal (III)	506	597
IV. Service Charge During Construction	390	316
Total	18,188	16,357

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants		
Survey, Design, Investigation, and Supervision for Okhaldhunga Phaplu Environment Friendly Road (OPEFR)		Sep 1998
Survey, Design, Investigation, and Supervision for Jayaramghat Diktel Environment Friendly Road (JDEFR)		Jan 1999
Construction Supervision for OPEFR and JDEFR		Oct 2001
Civil Works Contract		
Date of Award	Sep 1992	
Completion of Work	Jun 1999	Jun 2002
Equipment and Supplies		
First Procurement	Aug 1992	
Last Procurement	Jun 1994	
Other Milestones		
First Partial Cancellation		Feb 1999
First Loan Reallocation		
Second Loan Reallocation		Aug 2000
Extension of Loan Closing Date		Aug 2000
Final Cancellation of Undisbursed Loan Balance		Dec 2002

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 30 Jun 1998 to 30 Sep 1998	Satisfactory	Satisfactory
From 1 Oct 1998 to 31 Dec 1998	Unsatisfactory	Satisfactory
From 1 Jan 1999 to 31 May 1999	Unsatisfactory	Satisfactory
From 1 Jun 1999 to 31 Dec 1999	Partly Satisfactory	Partly Satisfactory
From 1 Jan 2000 to 30 Jun 2000	Partly Satisfactory	Partly Satisfactory
From 1 Jul 2000 to 31 Nov 2000	Partly Satisfactory	Partly Satisfactory
From 1 Dec 2000 to 31 Dec 2000 ^a	Satisfactory	Satisfactory
From 1 Mar 2001 to 31 Dec 2001	Satisfactory	Satisfactory
From 28 May 2002 to 30 Jun 2002	Satisfactory	Partly Satisfactory

^a Based on the new project performance rating.

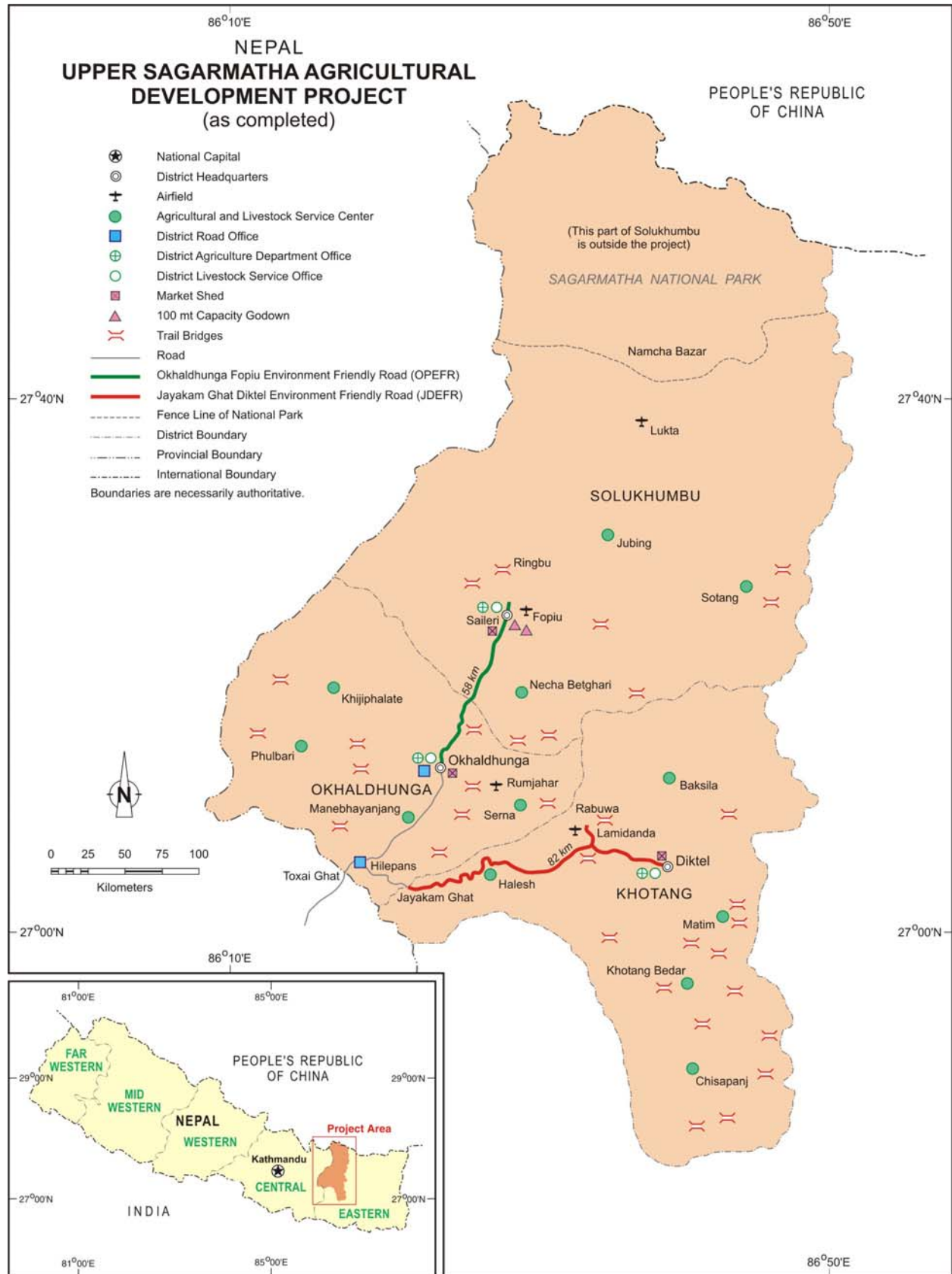
D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Project Inception	1–8 July 1992	1	7	a
Review 1	10–28 Feb 1993	2	36	a, b
Special Project Administration 1	27 May–9 Jun 1993	2	24	c, d
Review 2	5–15 Jan 1994	2	20	d, e
Review 3	19 Nov–2 Dec 1994	1	13	d
Special Project Administration 2	12–24 Mar 1995	2	3	d, f
Review 4	17–24 Nov 1995	2	14	g
Special Project Administration 3	4–8 Aug 1996	2	8	h, i

Midterm Review	1–12 Dec 1996	3	33	h, i, j
Special Project Administration 4	22 Apr–13 May 1997	3	61	k, h, i
Review 5	17 Dec 1997–8 Jan 1998	1	22	k
Review 6	4–19 May 1998	2	30	k, j
Review 7	7–9 Sep 1998	1	3	k
Review 8	11–25 Dec 1998	2	48	k, l
Review 9	6–9 Apr 1999	1	3	k
Review 10	28 Dec 1999–21 Jan 2000	2	46	k, i
Review 11	30 Mar–19 Apr 2000	2	40	k, i
Review 12	23 Feb–7 Mar 2001	2	24	k, i
Review 13	17–25 Dec 2001	2	16	k, m
Review 14	2–10 May 2002	1	8	m
Project Completion Review ^b	13–27 Feb 2004			m, n, o, p, q

^a a - senior project economist, b - senior project administrative clerk, c - project engineer, d - rural development specialist, e - project administrative assistant, f - loan administration assistant, g - senior project specialist, h - senior project engineer, i - project implementation officer, j - road engineer, k - project administration and/or implementation officer, l - environment friendly rural infrastructure consultant, m - project officer, n - project administration unit head, o - social and gender specialist, p - agroeconomist, q - hill transport engineer.

^b The project completion report was prepared by L. Sharma, project officer, and P. Logan, project administration unit head. The project completion report was prepared well after project closing because of the delay in fielding the Project Completion Review Mission, due to an adverse security situation in the project area.



I. PROJECT DESCRIPTION

1. At the time of project preparation (1990), about 93% of Nepal's population depended on agriculture as the main source of income. Agriculture accounted for about 54% of gross domestic product. Most of the value added contributed by the agriculture sector was mainly from crop production (49%), followed by livestock production (27%). The Government accorded top priority to the agriculture sector in the Sixth Five-Year Plan (FY1981–FY1985). Agriculture continued as a high-priority sector in the Seventh Five-Year Plan (FY1986–FY1990), and during this period the Government requested Asian Development Bank (ADB) technical assistance to prepare a development project for the three northern districts in the Sagarmatha zone. In response, ADB approved technical assistance,¹ and the consultants submitted their report in September 1989. Loan fact-finding was completed in February 1990. Based on feasibility study findings and discussions with the Government and consultations with development partners, a project was formulated. An appraisal mission was fielded in March 1991 to finalize the project scope and implementation arrangements.

2. ADB approved a loan of SDR9.77 million for the Upper Sagarmatha Agricultural Development Project on 31 October 1991. The Loan Agreement was signed on 14 January 1992 and became effective on 5 May 1992. Together with the loan, ADB approved two advisory technical assistance² undertakings to build and strengthen the institutional capabilities of the Government and local institutions. The Project's objectives were to (i) increase agricultural productivity, employment, and income of the rural population within the project area, (ii) improve hill ecology for sustainable agricultural development, and (iii) promote the local people's participation in sustainable development activities by actively involving them in the planning and implementation of the Project. The Project had three components:

- (i) **Production support component.** This was comprised of four subcomponents:
 - (a) **Crop production.** This included strengthening crop extension activities, implementing adaptive crop trials, demonstrating techniques, multiplying and distributing seeds, and storing and distributing fertilizer.
 - (b) **Livestock production.** This included strengthening livestock extension, animal breeding, and health care and augmenting fodder resources.
 - (c) **Women's development.** This included the establishment of a women development section³ (WDS) in each of the three districts and promoting community development through provision of small drinking water supply units, functional literacy classes, and basic nutrition and child care information.
 - (d) **Credit.** This included provision of credit for crop, livestock, and women's development enterprises.

¹ ADB. 1988. *Upper Sagarmatha Integrated Rural Development*. Manila.

² ADB. 1991. *Women Skills Development*. Manila.

ADB. 1991. *Training and Project Benefit Evaluation*. Manila.

³ WDSs are composed of field staff members of the Department of Women Development.

- (ii) **Hill transport component.**⁴ Originally, this included improvement and upgrading of 203 kilometers of trails, construction of 57 trail bridges, and construction of a district road office in Okhaldhunga. However, at the Government's request, the decision was made to not improve 203 kilometers of trails and instead construct 141 kilometers of environment friendly roads (EFRs) and install a vehicle-ready ferry at Jayaramghat.
- (iii) **Project management support component.** This covered operating costs, including those related to staff members and equipment of a project implementation unit (PIU) and engagement of district voluntary workers and community motivators.

3. The Ministry of Agriculture and Cooperatives (MOAC)⁵ was the lead executing agency responsible for planning and coordination, reviewing progress, and reporting on overall implementation of the Project. The Department of Agricultural Development, Department of Women Development (DWD),⁶ and participating banks were the implementing agencies for the Project. Responsibility for the hill transport component was originally with the Ministry of Works and Transport (as per appraisal), but this was transferred to the Ministry of Local Development (MLD) in 1993.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

4. The project's design and formulation were consistent with the Government's strategy enunciated in the Seventh (FY1986-FY1990) and Eight Plan (FY1992-FY1997), which accorded special priority to the hill development, with special emphasis on intensification of farming and preservation of the hill ecology. The Project was consistent with the ADB's operational strategy in Nepal at the time of approval.⁷ Although poverty reduction was a long-term development objective of the Project, the design did not incorporate adequate measures to achieve this. Emphasis was given to extension of regular government programs. No provision was made for roads that would improve the accessibility of project districts in conjunction with production support components. As a result, a lack of quick and easy market access was noticed. This caused poor people to continue with either traditional cereal or limited cash crop farming, which met local demand and discouraged crop diversification. In remote areas, where access is very difficult and food is scarce, farmers felt strongly compelled to produce and conserve annual cereal crops. Although the Project was designed based on the implementation experience of similar projects supported by ADB and other development partners in Nepal, the Project Completion Report (PCR) Mission noted that consultations at the field level were not adequate to capture local demands and needs during project preparation.

⁴ Referred to as the "Improvement of Hill Transport Infrastructure Component" in the original project document.

⁵ The Executing Agency at the beginning of the Project was the Ministry of Agriculture. In 2000, the ministry was renamed MOAC.

⁶ The Women Development Division, at the beginning of the Project, was under MLD. In 1999, the division was shifted from MLD to the Ministry of Women and Social Welfare. Later in 2000, the division and the Ministry of Women and Social Welfare were renamed DWD and the Ministry of Women, Children and Social Welfare, respectively.

⁷ Support for agriculture development was a prominent feature of the ADB's operational strategy. ADB's efforts in the agriculture sector were mainly directed at enhancing food production and diversification in cash crops, horticulture, and animal husbandry. This entailed intensification of agriculture in the terai and selected hill areas.

5. Agriculture and rural development remain priority sectors of ADB, given the vital need to reduce poverty in rural areas. However, a drop occurred in lending to the agriculture sector over recent years.⁸ Currently, the agriculture sector is second on the priority list in terms of the number of projects and third in terms of funding.

6. Project design did not provide criteria, procedures, or mechanisms to ensure the links among the activities of the various project components. The activities of crop production, livestock production, women's development, and hill transport were planned to be implemented independently, in widely scattered locations, without consideration for the mutual complementarities and difficult terrain of project districts.

7. The Project's institutional arrangements were not well defined during appraisal. The roles and responsibilities of regional directorates were not highlighted, and no provision was made for an engineering unit to implement civil works. Several trials and adjustments in project management occurred during project implementation (para. 27). To overcome implementation delays, the Midterm Review Mission elaborated the responsibilities of regional directorates and district level offices. While this improved the performance of project managers, further improvements were identified by the January 1998 Review Mission that made the project management office (PMO) more effective and allowed the PMO to interact continuously with project stakeholders. Consequently, the project management organizational structure (Appendix 1) was revised in 1998, with the PMO placed under MOAC and becoming responsible for implementation of the hill transport component. This was not consistent with the Government's policy for implementing rural roads, as these were normally under MLD. However, the revision favored community mobilization that was designed to increase people's participation.

8. As designed, the hill transport component was unambiguous and simple. However, during implementation, this component became controversial and politically sensitivity. At the time of appraisal, no plan existed to construct two EFRs. Immediately after the Project started, the Government requested ADB to reformulate this component, originally comprising only hill trails, to include the construction of a new district road linking the project area and the main road network (East-West Highway). In September 1993, ADB endorsed financing to construct tracks that were 1.5 to 2 meters wide, following the methodology adopted for EFRs (low-cost, fair-weather road construction), on the condition that the Government used its own resources to develop the tracks to fair-weather, vehicle-ready roads. ADB decided to proceed with the construction of the Okahldhunga-Phaplu EFR in 1997 and the Jayarmghat-Dikel EFR in 1998. This made the project design more relevant and consistent with the intended objectives of improving rural incomes and promoting people's participation. The PCR Mission was of the view that the Project would have been more beneficial had the roads been built first and then supported by supplementary component activities.

B. Project Outputs

9. The PCR Mission reviewed project outputs by component, assessed these against expectations, and evaluated their performance. Outputs under the production support component were broadly in line with what was envisaged at the time of appraisal. However, at

⁸ Lending to the agriculture sector from 2001 to 2003 was only 8% of total approved lending (\$249 million), compared with lending to the social sector (47%) and transport sector (18%). Only one project of \$20 million under the agriculture sector was approved in 2003. In 2003, 17% of the total lending portfolio was for the agriculture sector, compared with 24% in 2001.

the Government's request, substantial changes were made to the hill transport component from 1996 to 1998. Actual project outputs are compared with appraisal targets in Appendix 2.

1. Production Support Component

10. The Project constructed buildings in all three districts, including 12 agriculture and livestock service centers;⁹ 3 district agriculture development offices (DADOs); 3 district livestock service offices (DLSOs); and several duplex quarters for senior officers, junior technicians, and junior technical assistants. Most of the buildings were completed before 1999, and one DADO and one DLSO were constructed in each project district. The PCR Mission was informed that most of the agriculture and livestock service centers were of poor quality. Some of the centers were without water supply. Very limited numbers of staff members were present in their duty stations due to the adverse security situation and remoteness of the centers. Due to the adverse security situation, the PCR Mission was able to verify the quality of only some of the civil works.

11. The Project supported agriculture extension services (e.g., crop trials, technique demonstrations, miniature kit provision,¹⁰ and seed kit provision), which achieved the quantitative targets set at the beginning of the Project. These services were continued after the completion of the Project, but to a lesser extent due to disruption of services caused by the ongoing insurgency. The Project provided seed handling equipment¹¹ and promoted a program of private production and sale of improved seeds in project districts. The three DADOs covered a total area of 1,056 hectares under a seed multiplication program (mainly for paddy, wheat, maize, and potato), which has continued to some extent after the Project. This program highlighted the importance of better seeds in farming, and therefore was quite popular among project beneficiaries.

12. The procurement and distribution of fertilizer was a major activity under this component, with a total loan allocation of \$5.5 million (38% of the loan amount). However, procurement was delayed until the Project's fourth year, because of misunderstandings by the executing agencies regarding project requirements¹² and procurement procedures. However, a total of 9,214 metric tons (t) of fertilizer were eventually procured and distributed in the project districts, against a target of 8,630 t. To facilitate fertilizer distribution, the Project constructed the following storage facilities (godowns): 12 with capacities of 10–15 t and one with a 100 t capacity. Fertilizer was sold to the intended beneficiaries from these godowns, which allowed distribution to be monitored.¹⁴ Farmers purchased fertilizers through their accumulated savings. As a result of the Project, current fertilizer application rates are 2.40 kg/hectares in Solukhumbu, 5.02 kg/hectares in Khotang, and 10.73 kg/hectares in Okhaldhunga representing only a marginally increase of 5-10%. Fertilizer use is a supplement to farmyard manure, which led to a better nutrient balance ratio. The fertilizer yield response was quite encouraging; for each kg of fertilizer used per ropani (0.05 hectares) production increased by 3 kg for paddy, 2.5 kg for wheat, and 3 kg for maize.

⁹ Separate building for agriculture and livestock service.

¹⁰ A miniature kit consists of a packet of seeds and necessary inputs, including fertilizer and pesticides.

¹¹ Nine portable grain moisture meters, 15 hand maize shellers, and 15 seed drum treaters.

¹² The November 1995 ADB Project Review Mission noted that an executing agency expected that funds might be used for road construction instead of fertilizer.

¹³ Although the Government has a policy to subsidize transportation of fertilizers to districts without roads, the Government does not allocate sufficient funds to implement the policy.

¹⁴ Although the Government has a policy to subsidize transportation of fertilizers to districts without roads, the Government does not allocate sufficient funds to implement the policy.

13. A total of 2,181 livestock of various improved breeds (against an appraisal target of 367) were distributed in the project area.¹⁵ A total of 51 animals were subject to artificial insemination during the project period. Development of pastureland was observed to be one of the most important activities to improve livestock production and hill ecology. Despite this fact, the target was reduced from 7,000 hectares to 1,090 hectares, mainly because of unavailable seed resources of required species. Instead of curtailing this target, the PCR Mission believed that some of the local species available in high-altitude rangeland could have been explored for their multiplication. Support to improve pastures in limited areas was also instrumental in developing more organized livestock farming. Activities related to animal health care exceeded the Project's target.

14. Three WDSs were established. Apart from in-country training and site visits, staff members of a few WDSs participated in training and study tours outside the country. Community development activities were carried out in the 20 village development committees (VDCs). A total of about 520 women's groups were formed. As very few women have access to formal education, WDSs provided literacy courses to all women's groups as an entry point of the program. The Project supported water schemes and toilets construction, trail improvements, and milling facilities installation. However, the outreach of these subprojects is minor, considering the size of the district population.

15. The Project supported expansion of all three categories of fruits¹⁶ covering an area of 250 hectares with an annual production of 2,377 t, and vegetables covering an area of 426 hectares with an estimated annual production of 3,557 t.¹⁷ The project organized various skill training, workshops, and exposure visits, and the distribution of fruit saplings and vegetable seeds to expedite the promotion of vegetable and fruit farming in the project districts. About 5,680 households and 1,920 households benefited from the vegetable and fruit production support provided under the Project.

16. Eighteen branch offices of participating banks¹⁸ disbursed, under their program in the project area, about NRs278 million credits (against an appraisal target of NRs95 million) to local farmers and farmers' groups formed by agriculture and livestock services centers and women's groups formed by WDSs. Loan repayment rate was about 71% as of December 2003, which is quite low. Availability of credit was improved during the project period, but decreased after project completion due to increased insurgency. With the support of credit, individual farmers (including women) adopted practices promoted under the Project. About 35% of the farmers adopted the improved technologies during the implementation phase (1993-1999) of the project. Adopters have mixed responses on the improved technologies. Livestock (breed improvement, forage and fodder) and fruit farming technologies were more responsive because increased profitability was more evident than in the crop technologies. Although better initial capital utilization was evident, revolving of capital as well as mobilization was not effective due to closing of branch offices of participating banks due to ongoing insurgency.

¹⁵ The appraisal estimate of 367 proved to be an unrealistically low target vis-à-vis the project area.

¹⁶ Tropical fruits (mango, banana, guava, papaya, jackfruit, pineapple, and litchi) in valley areas, citrus (orange, sweet orange, lime, lemon, etc) in the mid hills, and temperate fruit (apple, pear, peach and plum) in high hills. Although this was not specifically included in the original project design, this was introduced at an early stage of the Project when the good potential due to favorable climatic condition were realized.

¹⁷ This is an additional achievement of the Project, which was not envisioned during appraisal.

¹⁸ Participating banks were three commercial banks: Agricultural Development Bank of Nepal, Nepal Bank Limited, and Ratriya Banijaya Bank.

2. Hill Transport Component

17. The revised hill transport component comprised the construction of the Jayaramghat-Diktel EFR (82 kilometers), the Okhaldhunga-Phaplu EFR (59 kilometers), truss and suspension trail bridges (55), and vehicle-ready bridges at Solu and Langoor Khola and a vehicular ferry at Jayaramghat. Except for the construction of two EFRs, all other activities under this component were completed, with the overall physical progress estimated at 95% of the target at completion.

18. The implementation progress of this component, however, was unsatisfactory, even during the early part of project implementation. This was because of a change in the local perception of this component and consequent demand for an Okhaldhunga–Solukhumbu vehicle-ready road instead of the improvement of selected trails. Uncertainty also existed regarding the scope of this component until the December 1996 Midterm Review Mission. Implementation of the EFRs did not start until December 1998.

19. Construction of trail bridges was delayed significantly. In fact, nothing commenced for about the first 5 years, until after the decision to construct EFRs in 1997. Trail bridges were built between December 1997 and June 2000, although quality was a concern during the construction period. However, bridge problems were corrected during construction, and most trail bridges are now in good condition and functioning satisfactorily. Their maintenance and sustainability, however, is a concern.

20. In August 2000, the loan closing date was extended by 2 years, to June 2002, to complete construction of the two EFRs. Because of their late inclusion, implementation was rushed. Even with the extended project period, both EFRs remain incomplete in a number of locations¹⁹ and are not operational. Implementation difficulties in most of the incomplete sections were related to difficult terrain and security issues. In November and December 2001 and March 2002, insurgents attacked and destroyed the key government offices in Solukhumbu, Okhaldhunga, and Khotang districts. Due to lack of communication and electricity in Solukhumbu and Okhaldhunga, and a dusk to dawn curfew in all three districts, project staff members, construction supervision consultants, and technical assistance consultants faced difficulty in implementing and monitoring project activities. The security situation adversely affected group formation and mobilization, consultant's mobilization, work hours, office operation, communication, transportation of goods, inspection of completed works, quality control, payment to labor groups, and report production. Without security problems, both EFRs may have been able to be finished.

21. Immediately after project closing, Khotang's district development committee (DDC) and the Government consulted with the Rural Access Programme²⁰ to find possible ways to continue construction of the uncompleted stretches in Jayaramghat-Diktel EFR. As a result, work resumed in June 2003. The PCR Mission was informed that the incomplete stretches are mostly

¹⁹ The major incomplete sections in the Okhaldhunga-Phaplu EFR include about 4 kilometers in the Barnnauli VDC of the Okhaldhunga district, about 1 kilometer in the Kerung VDC of the Solukhumbu district, and about 7 kilometers in the Tingla VDC of the Solukhumbu district. The major incomplete sections in the Jayaramghat-Diktel EFR are located in the Bahunidanda, Badhare, Dhitung, Dorchim, and Mahadevsthan VDCs, with approximate incomplete lengths of 9 kilometers, 2 kilometers, 1 kilometers, 2 kilometers, and 1 kilometer, respectively.

²⁰ Khotang district's rural access program, supported by the Department for International Development, United Kingdom, was working since 2002 to support preparation and implementation of a district master plan. One of the key elements in this program is the coordination with other programs working in targeted districts.

in difficult terrain, and construction through labor groups is not possible. Local contractors were therefore mobilized since January 2004. The Jayaramghat-Diktel EFR and the Hilepani-Jayramghat roads should be functional by July 2005.

3. Project Management Support Component

22. The Project operated in Khotang, Solukumbu, and Okhaldhunga districts through district level offices (Agriculture Inputs Corporation offices, commercial banks, DADOs, district livestock support offices, horticulture farms, and WDSs). The Project supported the establishment of a PIU and district level offices, including incremental staffing and equipment. The Project also supported the engagement of 87 community mobilizers (3 district resource people, 12 service facilitators, and 72 community motivators) for the Project's community mobilization program. The Project's implementation arrangements are described in paras. 26–30. The location of the PMO was frequently changed, in an effort to improve coordination and access to the project area. However, this affected the effectiveness of project management and intra-agency and interagency coordination. The project area's remoteness constrained the monitoring and supervision of activities by the PMO. Project management support in terms of equipment, facilities, and office supplies was adequate. However, the Project suffered from a lack of staff members in field offices and service centers and slow decision making.²¹

C. Project Costs

23. The Project's estimated cost at appraisal was \$18.19 million, including a foreign exchange component of \$5.36 million and a local cost component of \$12.83 million. The actual total project costs amounted to about \$16.36 million, including \$0.32 million for service charges during construction. Expenditure by component was about \$8.25 million for production support, about \$7.19 million for hill transport, and about \$0.60 million for project management. ADB financed the entire foreign exchange cost (\$3.97 million) and part of the local currency cost (\$7.22 million). About 68% of the total cost of the Project was financed by ADB, which is below the appraisal estimate of 73%. This was because of the cancellation of about \$2 million of the loan. The project costs and financing arrangement projected at appraisal and actually incurred at project completion are shown in Appendix 3.

D. Disbursements

24. The loan amount at appraisal was SDR9.77 million, of which a total of SDR8.29 million was disbursed and a total of SDR1.49 million was canceled.²² As provided in the Loan Agreement, imprest accounts were established for a total sum of NRs36.10 million, to ensure timely disbursement and efficient project implementation. The imprest advance was fully liquidated on 4 April 2000. The statement of expenditure procedure was also used under the loan. Because of the small amount of individual expenditures under the Project, the imprest accounts and statement of expenditure procedure were found to be very useful and provided significant support in ensuring smooth project implementation. The loan account was closed on 20 December 2002. Yearly, and quarterly loan disbursements are shown in Appendix 4.

²¹ ADB. 2000. *TA 1591-NEP: Training and Project Benefit Monitoring*. Manila.

²² The first partial cancellation was on 24 February 1999, for about \$0.54 million, and the remaining undisbursed balance of \$0.75 was cancelled on 20 December 2002.

E. Project Schedule

25. The Project was originally envisaged to be implemented over 7 years, with the estimated date of completion on 30 June 1999 and loan account closing on 30 June 2000. The major delay in the Project was in the hill transport component. Activities were delayed by about 5 years (from 1992 to 1997) because of slow decision making; inadequate numbers of staff members, inadequate budget and equipment; lack of project focus; weak project management; and significant political interference. An ADB mission in May 1997 resolved major issues regarding the hill transport component, and its progress was reasonable until January 2000, when ADB suspended payments to contractors and consultants due to poor quality of civil works. Those concerned were instructed to rectify the defective works at no additional cost to the Project. An ADB audit mission visited the Project in May 2000 to investigate the poor quality of civil works. As a result of the investigation, ADB's Anticorruption Unit sanctioned two lead domestic consulting firms for 1 year, from 15 June 2001. On 8 August 2000, ADB approved the Ministry of Finance's request to extend the loan closing date by 2 years, to 30 June 2002, to complete the EFRs. A comparison of scheduled and actual project implementation is in Appendix 5.

F. Implementation Arrangements

26. MOAC was the lead executing agency for the Project and was responsible for planning, coordinating, reviewing progress, and reporting on overall project implementation. The other two executing agencies were MLD and the Ministry of Works and Transport. The project appraisal envisaged that each component would be implemented by each of the executing agencies, according to their technical specialties, generally independent of each other. Commercial banks were to disburse credit; Department of Agriculture Development and Department of Livestock Services of MOAC were to implement the crop and livestock subcomponent of the production component; Department of Roads (DOR) of the Ministry of Works and Transport was to implement the hill transport component; and DWD of MLD was to implement the women's skills development subcomponent. However, actual implementation arrangements were changed after appraisal.

27. A project coordination committee was established at the national level to facilitate interagency coordination. A small PIU headed by a project manager, with support staff members, was envisaged during appraisal. In July 1992, a PIU was established in Okhaldhunga and a contact office at Kathamdu in 1994. The Kathmandu contact office gradually developed into a full-fledged PMO (later renamed the project coordinator's office [PCO]). A revised project management organizational structure was adopted from January 1998 (Appendix 1), and three PIUs (one in each district) were established. At the beginning of 1999, the PIU at Okhaldhunga was merged into the project field office (PFO) at Okhaldhunga. The PCO was relocated from Kathmandu to Okhaldhunga and the PFO from Okhaldhunga to Diktel in the second quarter of 2000. Frequent changes in the location of offices (PCO, PFOs, and PIUs), with an aim to improve effectiveness, led to delays in project implementation. As appraised, the production support component was implemented through district-level line agencies. The credit subcomponent was implemented through 18 branches of three participating banks operating in the project area.

28. The Project's appraisal report envisaged that the Community Mobilization Program (CMP) would be implemented through the involvement of local nongovernment organizations (NGOs), to strengthen the agriculture and livestock extension and training activities by availing of the services of district voluntary workers and a community motivator. Accordingly, to

implement the CMP, three local NGOs were engaged to provide and organize district voluntary workers at the beginning of the Project. However, due to objections by the Office of the Comptroller General of Nepal, they were discontinued in July 1995, and the program was not implemented during July 1995–May 1997. However, officials eventually realized that few of the Project’s intended beneficiaries had heard of it by the fifth year of its implementation. Accordingly, the April–May 1997 Special Project Administration Mission recommended the introduction of a three-tier CMP system to substitute the earlier approach of community mobilization through NGOs. The program was started from FY1997/98 with 3 district resource people, 12 service center facilitators, and 48 community motivators.

29. Although DOR was originally envisaged to implement the hill transport component, in June 1994²³ the Government requested that responsibility be given to MLD. However, this component was implemented by the PCO and a PIU, with the support of engineers deputed from DOR. An implementation arrangement was agreed in 1997 to implement the Okhaldhunga-Phaplu EFR. Two basic features of the EFR approach used by the Project for the construction of roads are (i) mobilization of local people and employment of local labor (the users group approach) and (ii) adoption of EFR practices. Implementation of the EFR was started without adequate preparation. For example, the preparation of the necessary documents and guidelines started simultaneously. In addition, although EFR methodology requires strict adherence to the 3-year phasing of works, the plan was to complete 140 kilometers of these roads in only 2 years. The detailed implementation arrangements for EFRs under the Project are described in Appendix 6.

30. All trail bridges were implemented through turnkey contracts, with design and construction done by the same contractor. The turnkey contractors involved were joint ventures of designers, manufacturers, and contractors with experience in trail bridges. Turnkey contractors were contracted separately for a first lot of 20 trail bridges and a second lot of 34 trail bridges. Contractors were also hired separately for trail bridge protection works. This arrangement proved effective.

G. Conditions and Covenants

31. The loan was declared effective following fulfillment of the conditions of loan effectiveness. Audited project accounts and the auditor’s report were submitted to ADB on time and in accordance with sound auditing standards.

32. Out of the 30 major loan covenants, 24 were complied with, 2 were complied with after a delay, 1 was partly complied with, 1 became nonapplicable, and 2 were not complied with (Appendix 7). The loan covenants that were not complied with were related to operation and maintenance of project facilities.

H. Related Technical Assistance

1. Women Skills Development

33. This technical assistance activity was approved for \$0.2 million, in conjunction with the Project, to provide skills training to women’s groups. DWD was the Executing Agency. An international consultant (2 person-months) and a domestic consultant (8 person-months) were

²³ Since June 1994, MLD was made responsible for all local infrastructure, including trails and trail bridge.

recruited to support this undertaking. The performance of both consultants was satisfactory, although the international consultant's recommendations were not accepted by the Executing Agency on the grounds of being impractical.²⁴

34. The technical assistance, through WDSs, supported women and women's groups for their skills development in income-generating activities as well as in nutrition, child care, sanitation, health, and family planning. The technical assistance also included nonformal education and training in skills and leadership development and institutional development of women's groups. WDSs also established links between women and women's groups and participating banks for credit. Ten assistant-level staff members of WDSs participated in an observation tour to Bangladesh. Training of WDS staff members was effective. From September 2001 to June 2002, the women's CMP was implemented, concentrating on farming vegetables, raising small animals, and supporting agroforestry women's groups belonging to VDCs along the corridor of the two EFRs. A total of 132 groups (1,989 women farmers) were formed and mobilized by community motivators. Although short in duration, the CMP under the technical assistance helped women farmers become exposed to a number of outside areas and activities. The CMP was an effective program for reaching intended beneficiaries, but it unfortunately did not commence until the last year of the Project. Although limited, all targeted outputs of the technical assistance were achieved. The technical assistance was relevant and its design was consistent with its objectives. Overall, the technical assistance was rated successful. The technical assistance completion report is attached (Appendix 8).

2. Training and Project Benefit Evaluation

35. This technical assistance activity was divided into two parts: Part A focused on training. Part B was the project benefit evaluation component. Part A's main objective was to train DLS and DOA staff members, key farmers, and local institution leaders in promoting sustainable agriculture development in the hill ecosystem. Part B's objective was to assist the monitoring and evaluation division of MOAC in developing its long-term project review, evaluation, and impact assessment capabilities. Three domestic consultants²⁵ were procured for 139.5 person-months during the technical assistance implementation period. The performances of all three consultants were rated satisfactory. TA consultants assisted DLS and DOA to collect information related to Project outreach and efforts were made to design a monitoring system.

36. The technical assistance design was adequate, and the terms of reference were clear and comprehensive at approval. But modifications were made during implementation, because of the inclusion of the implementation of two EFRs under the hill transport improvement component of the Project, helping the Project to meet its overall objectives. Farmers received training on vegetable cultivation, pasture management, and potato seed production. The training was reported to have increased family income by enabling families to grow more and better quality potato seeds and vegetables. About 700 beneficiaries of the three project districts received EFR training, and more than 7,000 local people received on-the-job training. The trained labors were employed in other similar construction jobs within and outside the project area. Overall, the technical assistance was rated successful. The technical assistance completion report is attached (Appendix 8).

²⁴ ADB. 1995. *Memorandum of Understanding, ADB Loan Review Mission*. Manila.

²⁵ Training and project implementation consultant (47 person-months), senior hill transport consultant (46 person-months), and hill transport consultant (46.5 person-months).

I. Consultant Recruitment and Procurement

37. The Executing Agency recruited and mobilized consultants for survey, investigation, design, and supervision of the EFRs, in accordance with ADB's *Guidelines of the Use of Consultants*. The Executing Agency took 11 months to hire the consultants, and they were mobilized in May 1998, with a contract agreement valid until July 2000. The Government and the consultants could not agree on the further extension of the services for the project extension period, and consequently the services were terminated in July 2000. This caused the fieldwork to halt at the beginning of the extension period. In March 2001, a process was initiated to hire new consultants to supervise the outstanding works for the EFRs, but they were not mobilized until 30 October 2001. About 14 months, which was crucial for the completion of the outstanding works, was lost in the process of deciding whether to continue with the original consultants or to hire new consultants for the extended project period. The new consultants' work was affected by the adverse security situation in project districts.

38. Civil works and construction materials and equipment and furniture were procured through local competitive bidding and direct purchase, in accordance with ADB guidelines. Two EFRs were constructed following the users group approach (mobilization of local people and employment of local labor). The Project's gabion wire was purchased in quantities estimated to be sufficient for the construction of the EFRs. Since these were not completed, a substantial amount of the gabion wire remains unused and is stored in open spaces in different places along the road alignments. As high demand exists for gabion wire among local people, government agencies, and security personnel, the remaining gabion wire may be used for nonproject purposes, lost, or stolen. Major procurement under the loan is shown in Appendix 9.

J. Performance of Consultants, Contractors, and Suppliers

39. ADB's Anticorruption Unit sanctioned the consultants engaged for survey, investigation, design, and supervision for 1 year from 16 June 2001, because of irregularities. The new consultants started their services from November 2001, with the partial resumption of construction works. Due to adverse security situations in all project districts, the consultants were unable to provide optimal inputs. After the loan closing date, the consultants were funded under the Rural Access Program. A number of consultants' staff members had little or no previous EFR experience, so the technical assistance supported the training of consultants' staff members.

40. The performance of new consultants, contractors, and suppliers was rated satisfactory.

K. Performance of the Borrower and the Executing Agencies

41. The performance of the Borrower and the executing agencies was rated partly satisfactory. Slow decision making, lack of project focus, inadequate staff and budget, and weak project management throughout the project implementation period contributed to project delays. Until the Midterm Review Mission, no incremental resources were made available to increase the extension, research, and demonstration activities under the crop and livestock production components or provide these activities with the additional equipment and supplies envisaged in loan documents. The Borrower did not take appropriate action to prevent delays during project implementation.

42. The Government lacked commitment in fulfilling the assurances provided to ADB with regard to completing the Katari-Okhaldhunga feeder road and the 10-kilometer Hilepani-

Jayaramghat road, both of which were needed to connect project districts to the national road network. The connectivity issue was flagged by the Government since 1995, but these roads were not given priority. However, the Royal Nepal Army started constructing the Katari-Ghurmi-Okhaldhunga feeder road in 1995. A gravel standard road to Ghurmi²⁶ was completed, and bus service is available to Ghurmi. No bridge spans the Sunkoshi River. A ferry was constructed for crossing vehicles. However, a flood washed the ferry away. An earthen rough road was opened between district headquarters and Toxelghat, at Toxel VDC, on the north bank of the Sunkoshi River. Recently, some entrepreneurs managed to move a few tractors and trucks across the Sunkoshi by boat. These vehicles now operate during the dry season on the rough earthen road between Toxelghat and Okhaldhunga Bazar, but with great difficulty. The Hilepani-Jayamghat road is important for linking Jayaramghat-Diktel EFR to the Katari-Okhaldhunga feeder road. The Government recently requested the World Bank to support the upgrading of the Katari-Gurmi (Sunkoshi) stretch during FY2005. MLD included the Hilepani-Jayaramghat road under the Rural Access Program, and the road was completed in May 2004. This implies that the Okhaldhunga-Phaplu and Jayaramghat-Diktel EFRs will be fully functional by 2005, provided that incomplete stretches of these EFRs and a bridge or ferry over the Sunkoshi River and the upgrading of the Katarai-Okhaldhunga road are completed.

L. Performance of the Asian Development Bank

43. ADB's performance was partly satisfactory. ADB was indecisive for about 4 years on the Government's request to change the scope of the hill transport component. Conflicting signals from ADB regarding this component caused confusion in the Government and also raised false expectations among the people. However, ADB's responsiveness was increased after the midterm review, when project administration was delegated to the Nepal Resident Mission,²⁷ which allowed closer consultation between the Government and ADB. ADB fielded 21 missions, including one project inception mission, one midterm review mission, four special loan administration missions, and one PCR mission. Although adequate staff member time was provided for missions, field supervision of project activities, given the remoteness and difficult terrain of the project district, was less than adequate.²⁸

III. EVALUATION OF PERFORMANCE

A. Relevance

44. The Project was fully consistent, at the time of approval, with the Government's and ADB's development strategy of increasing agriculture production. The Project aimed at increasing agriculture productivity with a view to reducing poverty. The Government's current development strategy supports agriculture and rural development, through commercializing, to increase agriculture productivity and employment and income generation. Agriculture and rural development remain priority sectors, given the vital need to reduce poverty in rural areas. However, the Project's design was only partly relevant to the Project's development objectives. Institutional and management arrangements were not realistically thought through at the time of appraisal. Project outputs were partly relevant to achieving project

²⁶ This forms part of the proposed Katari-Okhaldhunga road. Ghurmi is a place in Udayapur district, located south of the Sunkoshi River, across Toxelghat.

²⁷ The Project was delegated to the Nepal Resident Mission soon after the 1 January 1997 midterm review.

²⁸ Although frequent supervision missions were fielded (20 in total) only eight (about 60 staff days, including travel time) visited the project site during the project period of 9.5 years.

goals and purposes at the time of approval. At the Government's request, the scope of the hill transport component was changed from 1996 to 1998, which made the Project's design more relevant to the Project's overall objectives.

B. Efficacy in Achievement of Purpose

45. Except for the EFRs included in the revised scope of the hill transport component, all physical targets were achieved. The effective numbers of service centers were limited by factors such as poor construction quality, inappropriate location, frequent absence and transfers of staff members, lack of resources to undertake extension work, and adverse security situation. The Project's intangible outputs included institutional development, community strengthening, and social and economic empowerment. However, the effectiveness of these outputs was less than adequate. The appraisal estimated the Project's quantifiable benefits to be an incremental annual production of rice (3,270 t), wheat (1,484 t), maize (9,572 t), and potatoes (19,265 t) at full development in the year 2000. A comparison of these targets against the achievements shows that the performance was only about half the targets (Appendix 10). The targets may have been overly optimistic in view of the difficulties encountered in providing optimal inputs, due to difficult terrain and the remoteness of project sites.

46. The Project supported the expansion of three categories of fruit (tropical, citrus, and temperate) in a 250-hectare area that has an annual production of 2,377 t. Likewise, both summer and winter vegetables were promoted in a 426-hectare area that has an estimated annual production of 3,557 t. Various training, workshops, exposure visits, and distribution of fruit saplings and vegetable seeds were quite instrumental in achieving changes. This is an additional achievement under the production support component.

47. The Project provided unskilled and skilled employment to local poor people (more than 4,500 people per day during the peak construction period) through EFR activities. As employment was on a paid basis, laborers earned significant incomes by working in EFR construction, although the employment was temporary in nature. Only limited longer term employment for local people was created for planned and routine maintenance of trail bridges.

C. Efficiency in Achievement of Outputs and Purpose

48. Financial and economic analyses were carried out using the same methodology used at appraisal. Financial internal rates of return (FIRRs) for investments in livestock enterprises ranged between 24% and 48%, against appraisal estimates of 35% and 66%, respectively (Table A11.7, Appendix 11). This was mainly due to investment costs being higher than appraisal estimates and comparatively lower than assumed productivity levels from different livestock enterprises managed by farm households. However, in general, FIRRs are attractive across all activities, confirming that the investments in livestock enterprises are profitable to farmers.

49. The economic internal rate of return (EIRR) on the basis of cost and benefit streams for the Project was 11.9%, against the appraisal estimate of 29.0% (Appendix 11). Although the EIRR was considerably lower than the appraisal estimate, it should be noted that the analysis does not include nonquantifiable benefits, such as employment and increased production in food deficient areas, increased local people's participation, improved access to markets, improved skills, and secondary and tertiary benefits to farm inputs suppliers and traders resulting from increased inputs use and production.

D. Preliminary Assessment of Sustainability

50. The Project almost achieved its anticipated targets in terms of the amount of physical infrastructure built, except the revised scope of the hill infrastructure component.

51. The concerned agencies do not have a system for routine maintenance of service centers, and the Government does not allocate enough funds for this purpose. Some of the service centers were already in need of major repair and maintenance at the end of the Project. General maintenance needs mentioned by district-level officers during the PCR Mission's field visit were repair of leaking roofs, broken windows, fallen plaster, water supply, and other general maintenance activities.

52. Ongoing insurgency activities adversely affected the use and sustainability of agriculture and livestock service centers and staff quarters at service centers built under the production support component. Insurgents damaged the DADO at Okhaldhunga, and security personnel are using project buildings at Salleri.

53. Repair, maintenance, and sustainability of constructed trail bridges are a concern. Although the Project handed over these bridges to the concerned DDC in June 2002, this DDC was not trained for repair and maintenance. DDCs lack a defined policy and plan and budgetary allocations for the repair and maintenance of trail bridges. The PCR Mission noted that current maintenance needs are minor and simple. However, in the absence of a system to inspect the condition of and proactively maintain trail bridges, the situation will be aggravated, and the minor maintenance may become a major problem over time. Similarly, the PCR Mission observed that the lengths of the Okhaldhunga-Phaplu EFR that were completed have not been maintained.²⁹ Therefore, a maintenance plan for road sections, suspension and truss bridges, and service centers needs to be prepared, endorsed, and implemented by DDCs and district line agencies.

E. Environmental, Sociocultural, and Other Impacts

54. The Project's overall environmental impact, as observed by the PCR Mission, was not significant in either a positive or negative way. Some landslides and erosion were noticed along roads, but the impact at present is not very significant compared to the naturally prevailing instability, erosion, and landslides.

55. A more significant and lasting impact of the Project was imparting skills to local poor people. Many of the people who worked on EFRs acquired masonry skills (construction of dry-stone walls and gabion structures and construction of simple cross-drainage structures). These people are now being employed because of their skills and are earning reasonable incomes. The District Roads Support Program, for example, employed or gave small contracts to several of these individuals.

56. The PCR Mission noted that WDSs were successful in empowering the women of the project area. Women started to participate in the training activities organized by different agencies at district headquarters. They were reported to be bargaining for programs to reduce

²⁹ The ADB-financed Decentralized Rural Infrastructure and Livelihood Project is expected to complete the Okhaldhunga-Phaplu EFR. A maintenance plan for the Jayaramghat-Diktel EFR is being prepared with Rural Access Program support.

their drudgery and also that of those helping them raise their status in society. The income-generating enterprises promoted under the Project improved the economic and social status of 3,326 women. The women's development subcomponent was considered effective, despite the relatively small expenditure.

57. If the EFRs were completed and operational, they could have significantly improved the accessibility of at least project district headquarters by bringing the districts into the national road network. This could also have opened new opportunities for marketing agriculture and livestock products outside project districts. The PCR Mission was informed by DOR that high priority was given to these roads, and DOR asked development partners, including ADB, to become included in the road sector project.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

58. The Project was rated partly successful in accordance with the review of its relevance, efficacy, efficiency, sustainability, and impact on institutional development.³⁰ Appendix 12 includes the quantitative assessment of project performance by ADB's criteria to determine the Project's rating. The Project was implemented as conceived, although with changes in scope for the hill transport component and the extension of the project closing date by 2 years, to complete the revised scope. Except for the hill transport component, all other components were completed.³¹ The Project's impact on improving hill ecology for sustainable agriculture development was fairly small. Although crop and livestock production practices were changed in the form of the replacement of local farming practices through improved technologies,³² these changes were behind the appraisal estimates. The economic analysis of the Project at completion shows that the EIRR was less than anticipated.

B. Lessons Learned

59. Improved rural infrastructure is a key to agriculture development and income improvement in rural areas. Therefore, to achieve project benefits or ensure sustainability, the project area should be made accessible.

60. While designing the Project, people's demands and needs should be analyzed thoroughly, and their participation should be strengthened at all stages of the project cycle.

61. Frequent changes in the implementation arrangements and administration structure of the Project created confusion and caused delays. Should there be genuine need for modifications, these should not be carried out without careful analysis of all relevant aspects, in consultation with all stakeholders. When management issues are particularly problematic or

³⁰ From 2000 to 2002, development objectives of the Project were rated successful, based on the revised project performance report criteria. Immediate objectives, including employment generation due to the resumption of the construction of the two EFRs, were being met until June 2002.

³¹ The ADB-financed Decentralized Rural Infrastructure and Livelihood Project is expected to complete the Okhaldhunga-Phaplu EFR, and the Rural Access Programme, funded by Department for International Development, United Kingdom, is expected to complete the Jayaramghat-Diktel EFR.

³² Using chemical fertilizers, introducing improved cereal seeds and livestock breeds, shifting toward stall feeding from free grazing, and shifting from cereal-based farming to cash crop-based farming.

complex, briefly engaging an independent specialist to assist with analyses and make recommendations may be preferable.

62. Although the target-oriented approach may have worked well in delivering required outputs, overemphasizing accomplishments in terms of numbers might have affected the quality of outputs. Poor construction quality could have partly resulted from placing too much emphasis on completing lengths of EFRs while setting aside compliance with EFR guidelines and concerns related to the geological condition of the terrain.

63. Strong and reliable and relatively independent and timely monitoring systems, with appropriate procedures to provide feedback and ensure actions based on the monitoring findings, are necessary.

64. Delayed and often very late payments to workers and a lack of measurement transparency are the main reasons for distortion in the users group approach and the occurrence of hidden contracts. A simplified procedure for approval and payment must be put in place. This is frequently done through a system of partial advances to workers (at least fortnightly). Moreover, transparent measurement and full pay for workers must be ensured.

65. Implementation of EFRs should not be rushed. Implementation is needed for local laborers to become aware of the concept and gain some on-site experience and for all concerned to become accustomed to all systems and procedures. The initial stage of construction should emphasize building capacity, setting practical procedures, and doing things correctly, rather than achieving quantitative outputs. Road construction by mobilizing local labor and using EFR principles requires intensive social mobilization and information dissemination sufficiently in advance of implementation, to ensure effective participation by the genuine beneficiaries. In this way, the quality and speed of works will gradually improve.

66. Any support for the construction of infrastructure, including buildings and bridges, must address operation, maintenance, and sustainability aspects from the very start.

67. When recruiting consultants, careful consideration should be given to the background and suitability of the technical personnel fielded by the consulting firm. If the consulting industry lacks specific experience in particular technical applications, such as EFRs, training must be provided. Since EFR construction is a relatively new concept, training may be needed at all technical levels, down to labor groups.

C. Recommendations

68. About 12 kilometers of the Okhaldhunga-Phaplu EFR and 17 kilometers of the Jayaramghat-Diktel EFR remained incomplete in a number of sections. In addition, the whole road length of both roads requires surface finishing. The Department for International Development's grant-funded Rural Access Programme included the Jayaramghat-Diktel EFR in its scope, as an additional impact component, and is financing the completion of the outstanding works. The Government and concerned DDCs therefore need to mobilize funds for the completion of the outstanding works of the Okhaldhunga-Phaplu EFR or be committed to meeting the criteria to include this EFR under the Decentralized Rural Infrastructure and Livelihood Project.

69. The Katari-Okhaldunga feeder road has regional significance, as it connects Okhaldunga, Solukhumbu, and Khotang districts to the national road network. Completion of

this road will make the following roads functional and link the three project districts to the Terai: (i) Okhaldhunga-Phaplu and Jayaramghat-Diktel EFRs; (ii) Okhaldhunga district roads that are under construction, with support from the Swiss Agency for Development and Cooperation-funded District Roads Support Programme; and (iii) Solukhumbu and Okhaldhunga district roads that may be constructed in the future under the ADB-funded Decentralized Rural Infrastructure and Livelihood Project. Proper finishing of the Katari-Okhaldhunga road with a facility (bridge or ferry) to cross the Sunkoshi River is essential for making these roads operational. The Government should give top priority to ensuring that this road meets at least all-weather gravel standards.

70. The absence of local bodies in the area for about 1 year after project completion contributed to the misuse of the Project's gabion wire. DDCs need to initiate a plan to use the gabion wire to complete two EFRs.

71. Agriculture and livestock extension services remained poor, due to the insurgency. A strategy and/or mechanism must be designed to provide the necessary extension support services and technical backstopping to farmers. A community mobilization program needs to be implemented to improve the effectiveness of agriculture and livestock extension services in the project area.

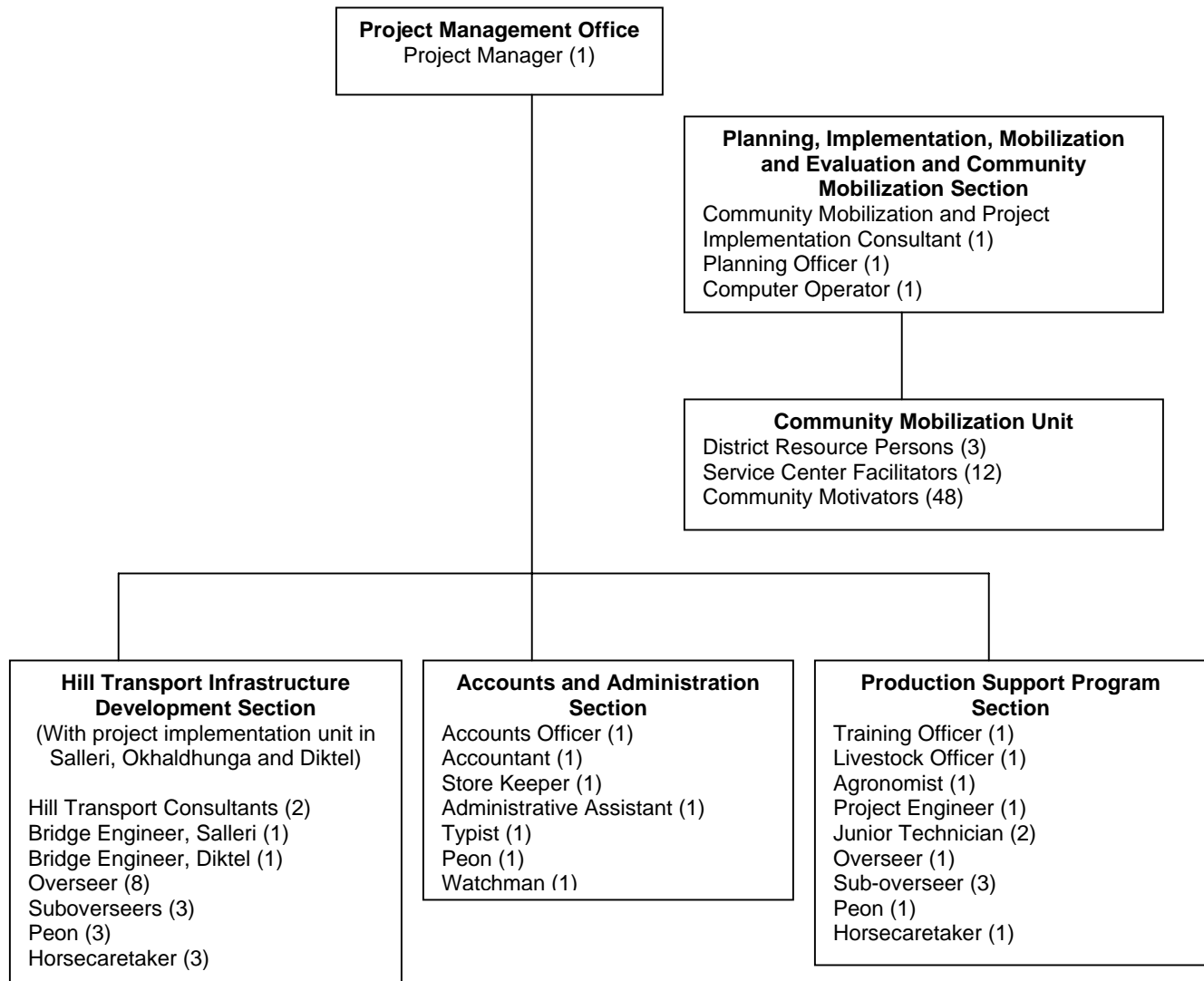
72. MOAC should take responsibility for the operation and maintenance of constructed agriculture and livestock service centers and facilities. Adequate funds also need to be allocated regularly for operation and maintenance of constructed service centers and facilities.

73. Service centers destroyed in the insurgency should be rehabilitated, and clear plans for their use should be prepared.

73. Local fodder species available in high altitude rangeland should be explored for their multiplication, and their uses should be expanded. Provisions to do this were incorporated in the Community Livestock Development Project.³³

³³ ADB. 2003. *Community Livestock Development Project*. Manila.

REVISED PROJECT MANAGEMENT OFFICE ORGANIZATIONAL STRUCTURE



Source: Asian Development Bank.

PROJECT OUTPUTS

Table A2.1: Planned and Actually Constructed Infrastructure

Items	Planned	Constructed
1. District Agriculture Development Office	One in Okhaldunga district headquarters	As planned
2. District Livestock Office (DLSO)	One in Solukhumbu district headquarters	One in Okhaldunga district headquarters
3. Duplex Quarter for DLSO Staff	One Khotang Headquarters	As planned
4. Agriculture Service Center (ASC)	Three in Okhaldunga Two in Solukhumbu Four in Khotang	ASC and livestock service center (LSC) combined and built agriculture and livestock service centers (four in Okhaldunga, three in Solukhumbu, and five in Khotang) ^a
5. LSC	Three in Okhaldunga Two in Solukhumbu Four in Khotang	
6. Godown (100 metric tons)	One in Okhaldunga headquarters One in Solukhumbu headquarters One in Khotang headquarters	One in Solukhumbu
7. District Road Office	One in Okhaldunga headquarters	As planned, but used as the project office and handed over to the district development committee at project completion
8. Duplex Quarters for District Agriculture Development Office (DADO)	—	One in Khotang
9. Duplex Quarters for Junior Technical or Junior Technical Assistant (DADO and DLSO)	—	One in Okaldunga, one in Solukhumbu, and one in Khotang
10. Single Quarters for DADO	—	One in Okhaldunga and one in Khotang headquarters
11. Market Shed	—	One in Okaldunga, one in Solukhumbu, and one in Khotang
12. Godown cum Training Hall (combined with agriculture and livestock service centers)	—	Four in Okhaldunga, three in Solukhumbu, and five in Khotang
13. Trail Improvements	Seventy-five kilometers in Okhaldunga, 65 kilometers in Solukhumbu, 63 kilometers in Khotang	Replaced by environment friendly roads that are 4-meters wide (17 kilometers in Okhaldunga, 30 kilometers in Solukhumbu, and 66 kilometers in Khotang)
14. Trail Bridge	57 trail bridges	55 ^b trail bridges
15. Vehicle-Ready Bridge	—	Solu Khola bridge (25-meter span) in Solukhumbu, at Salme, and Langur Khola bridge (15-meter span) in Khotang
16. Ferry	—	A ferry with a capacity of 15 metric tons on Dudhkoshi River, at Jayaramghat in Khotang

ASC=Agriculture Service Center; DADO=District Agriculture Development Office; DLSO=District Livestock Office; LSC=Livestock Service Center; — = not planned.

^a See Table A2.3 for location of buildings constructed.

^b See Table A2.3 for list of trail bridges.

Source: Project Completion Review Mission

Table A2.2: Location of Buildings Constructed

Item	Unit	District	Location	Construction Completed	Remarks
1. District Agriculture Office Buildings	2	Okhaldhunga	Okhaldhunga	14 Jan 1996	
		Khotang	Diktel		
2. District Livestock Service Office	1	Okhaldhunga	Okhaldhunga		
3. Agriculture and Livestock Service Centers and a Godown (10–15 metric tons)	5	Khotang	Chisapani	14 Jul 1995	
			Haleshi	14 Mar 1997	
			Kotang Bazar	12 Apr 1997	
			Matim	8 Mar 1999	
			Bakshila	12 Aug 1996	
	4	Okhaldhunga	Sena	29 Jun 1995	
			Manebhanjang	12 Apr 1997	
			Khihiphalaate	16 Nov 1995	
			Phulbari	8 Mar 1999	
	3	Solukhumbu	Kharikhola	28 Apr 1996	
			Nachabetghari	29 May 1997	
			Sotang	12 Apr 1996	
4. Duplex Staff Quarters	2	Khotang	Khotang Bazar	10 Jul 1999	
			Diktel	10 Jul 1999	
	1	Okhaldhunga	Okhaldhunga	14 Jan 1996	
	1	Solukhumbu	Salleri	1999	
5. Signal Quarters	1	Khotang	Diktel	29 Jun 1995	
	1	Okhaldhunga	Okhaldhunga	14 Jan 1996	
6. Junior Technical or Junior Technical Assistant Quarters	1	Solukhumbu	Salleri	1999	Used by security personnel
7. Duplex Quarters	1	Okhaldhunga	Okhaldhunga	1999	
	1	Khotang	Diktel	1999	
8. Godown (100 metric tons)	1	Solukhumbu	Salleri	13 Mar 1997	Used by security personnel
9. Market Shed	1	Khotang	Diktel	1999	Operational
	1	Okhaldhunga	Okhaldhunga	1999	Operational
	1	Solukhumbu	Salleri	1999	Operational

Source: Asian Development Bank.

Table A2.3: List of Trail Bridges and their Direct Influence on Village Development Committees

Item	Type/Span (m)	Village Development Committee Name	
		Left Bank	Right Bank
Solukhumbu District			
1. Barkhughat	Steel Truss/ 24.0	Deusa 9	Mukli 1
2. Junbesi	Steel Truss/20.0	Beni 3	Beni 3
3. Chisiple	Steel Truss/32.0	Salyan 2	Salyan 3
4. Paiyan Khola	Steel Truss/24.0	Jubing 7	Jubing 7
5. Handi Khola	Steel Truss/24.0	Chaurikharka 8	Chaurikharka 8
6. Loding Khola	Steel Truss/24.0	Tamakhani 5	Tamakhani 3
7. Hungeswor Ghat	Suspended/49.5	Dudai 5	Bung 1
8. khahare Khola	Suspended/34.0	Necha Batase 1	Salyan 4
9. Pekarnas	Steel Truss/ 24.0	Tingla	Tingla
10. Dyamde Upstream	Steel Truss/28.0	Salayan 9	Salayan 4
11. Ujeli Dovan	Steel Truss/24.0	Salayan 1	Necha Betghar Bimire
12. Salbesi Ghat	Steel Truss/24.0	Beni 6	Beni 2
13. Chiwang Ghat	Steel Truss/24.0	Salleri Chiwang	Salleri Phaplu
14. Khankhu Ghat	Suspended/50.0	Gundel 1	Gundel 1
15. Chanchalung Ghat	Suspended/60.0	Gundel 7	Gundel 6
16. Fulpate Khola	Suspended/50.0	Cheskam 7	Cheskam 7
17. Rahakhani Ghat	Suspended/130.5	Maheswori-2 Khotang District	Nachetghari 8
18. Kanku Ghat	Suspended/50.0	Kanku 2	Kanku 3
19. Koresi Ghat	Suspended/50.0	Goli	Chaula Kharka
20. Dibli ghat	Suspended/148.0		
Okhaldhung District			
21. Solung Khola	Suspended/131.8	Harkapur 3	Katunje
22. Kharte Khola	Suspended/129.4	Ratmate 8	Ratmate 5
23. Rungti Khola	Steel Truss/24.0	Barnalu 8	Okhaldhunga 3
24. Dumse Khola	Steel Truss/24.0	Phulbari 8	Bilandu 5
25. Juke Khola	Steel Truss/24.0	Yasam 4	Gamnamtar 2
26. Khoshi Dovan	Steel Truss/32.0	Moli 9	Waksa 9
27. Pankhu Kola	Suspended/80.0	Moli 3	Waksa 8
28. Andheri Dovan	Suspended/80.0	Beteni 7	Jaymire 8
29. Pokting Khola	Suspended/75.0	Bigutar 1	Bigutar 2
30. Dhungeni Dovan	Suspended/60.0	Rumjatar 3	Narayanstan 2
31. Charkhu Dovan	Suspended/48.0	Mamkha 4	Rumjatar 1
32. Chipling Khola	Suspended/45.0	Kalika Devi 8	Phulbari 6
33. Andheri Dovan	Steel Truss/28.0	Beteni 7	Jaymire 8
34. Dhungeswor	Steel Truss/28.0	Pokali 3	Pokali 2
35. Sisne Dovan	Steel Truss/28.0	Khiji Phalate 1	Khiji Phalate 4
36. Sepli Chhango	Steel Truss/24.0	Rangadeep 4	Patale 7
37. Pinapu	Steel Truss/24.0	Rajani 6	Ragani 5
Khotang District			
38. Tuwa Khola	Steel Truss/24.0	Chipring 7	Sapteswori
39. Pulling Phedi	Steel Truss/24.0	Bamrang	Buipa
40. Dhodre Khola	Steel Truss/24.0	Aiselukharka	Jaleswori
41. Tap Khola	Suspended/60.0	Patheka	Baspani
42. Sapsu Khola	Suspended/60.0	Chyandanda 7	Nirmali Danda 5

Item	Type/Span (m)	Village Development Committee Name	
		Left Bank	Right Bank
43. Chhepe Khola	Suspended/72.0	Nerpa 6	Diktel 4
44. Chiuri Bote	Steel Truss/20.0	Pauwasera 3	Pauwasera 5
45. Khapting Dovan	Steel Truss/24.0	Damarkhu Shivalaya 4	Likhuwa Pokhari 2
46. Kalleri Khola	Steel Truss/32.0	Kharpa 4	Kubinde
47. Langur Khola	Steel Truss/28.0	Lamidanda 3	Lamidanda 4
48. Makhuwa Khola	Steel Truss/20.0	Mattim 9	Ratanchha 8
49. Dhartung	Steel Truss/20.0	Chhitapokhari 9	Sapteswor 1
50. Sapsu I	Suspended/60.0	Chyandanda 1	Nirmali Danda 2
51. Tap Khola (Das Kathe)	Suspended/78.5	Kharmi 3	Baksila 8
52. Betuwa	Suspended/74.50	Pauwasera 5	Phaktang 7
53. Bayatar	Suspended/69.50	Maheswori 8	Jaleswori 3
54. Sapsu II	Suspended/ 70.0	Matim 7	Laphyang 4
55. Silauri Ghat		Jamire	Kuibir

m = meter.

Source: The end of assignment report of the senior hill transport consultant, in ADB. 2002. *Training and Project Benefit Evaluation*. Manila.

ACTUAL PROJECT COST
(\$'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Production Support Components			
1. Crop Production Support	849	1,498	2,347
2. Livestock Production Support	558	574	1,132
3. Women's Development	176	182	358
4. Credit	0	4,417	4,417
Subtotal (A)	1,583	6,671	8,254
B. Improvement of Hill Transport Infrastructure			
1. Construction of Environment Friendly Roads and Improvement of Trails ^a	1,288	3,953	5,241
2. Construction of Bridges	439	1,296	1,735
3. Transport, Equipment, and Civil Works	69	87	156
4. Recurrent Expenditure	2	56	58
Subtotal (B)	1,798	5,392	7,190
C. Project Management Support			
1. Transport and Equipment	267	184	451
2. Incremental Salaries	6	140	146
Subtotal (C)	273	324	597
D. Service Charge During Construction			
	316		316
Total	3,970	12,387	16,357

^a This line item was referred to as the "Improvement of Trails" in the original project documents; however, during implementation environment friendly roads were also covered under this item.
Source: Asian Development Bank.

YEARLY AND QUARTERLY LOAN DISBURSEMENTS

**Table A4.1: Yearly Loan Disbursements
(\$)**

Category	Year 1993	Year 1994	Year 1995	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000	Year 2001	Year 2002
01A Civil Works Part 1A		7,076	8,217	103,707	147,913	134,212	99,044	73,039		24,016
01B Civil Works Part 1B		7,109	17,015	128,465	122,199	109,443	78,574	38,067		20,341
01C Civil Works Part 2	197,832	430,314	126,818	32,641	10,580	51,012	1,377,939	2,047,054	595,849	1,757,433
02A Transport Part 1A		17,881	2,129	42,172	8,676	18,451	13,100	5,843		
02B Transport Part 1A (IV B)					642,839	160,743	166,013			
02C Transport Part 1B		19,015		29,988	19,796	20,963	17,120	10,200		
02D Transport Part 1C		53,090	9,037	44,044	73,800	41,458	66,848	55,361		
02E Transport Part 2		2,184	18,682	738		17,599	72,538	27,562	2,663	3,574
02F Transport Part 3		61,666	16,050	72,229	50,232	46,733	76,306	18,803	41,529	31,956
03A Incremental Cost Office Support (Part 1A)		75,710	19,909	33,316	81,368	95,419	100,099	55,451		
03B Incremental Cost Office Support (Part 1B)	6,888	76,025	22,879	22,879	73,212	79,432	70,230	73,513		
03C Incremental Cost (Part 2)		12,106	3,061			5,063	19,464	15,041		
04G Fooder Seed Part 1B (Local Exp.)										
04N Incremental Salaries (Part 1A)										
04O Incremental Salaries (Part 1B)										
04P Incremental Salaries (Part 1C)		15,283	5,898	10,908	10,717	3,243				
04Q Incremental Salaries (Part 3)		12,767	5,642	8,056	10,214	4,408				
05 Service charge during construction		2,399	12,450	15,288	21,753	33,515	43,637	65,339	77,956	43,403
Total	204,720	792,625	267,284	544,431	1,273,299	821,694	2,200,912	2,485,273	717,997	1,880,723

Part 1A=Crop Production Support; Part 1A (IVB) =Fertilizer procurement; Part 1B= Livestock Production Support; Part 1 C= Women in Development; Part 2= Hill Transport; Part 3=Project Management Support.
Source: Asian Development Bank.

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

Year	Quarter	Actual Disbursement	Actual Cumulative	Cumulative Percentage of Actual Disbursement
1993	I	—	—	
	II	—	—	
	III	0.000	0.000	0.000
	IV	0.205	0.205	1.763
1994	I	0.092	0.297	2.555
	II	0.001	0.298	2.563
	III	0.042	0.34	2.925
	IV	0.658	0.998	8.585
1995	I	0.000	0.998	8.585
	II	0.090	1.088	9.359
	III	0.170	1.258	10.822
	IV	0.008	1.266	10.890
1996	I	0.327	1.593	13.703
	II	0.005	1.598	13.746
	III	0.203	1.801	15.492
	IV	0.010	1.811	15.578
1997	I	0.194	2.005	17.247
	II	0.009	2.014	17.325
	III	0.651	2.665	22.925
	IV	0.420	3.085	26.538
1998	I	0.000	3.085	26.538
	II	0.166	3.251	27.966
	III	0.268	3.519	30.271
	IV	0.388	4.341	37.342
1999	I	0.037	4.378	37.660
	II	0.515	4.893	42.090
	III	0.796	5.689	48.938
	IV	0.852	6.541	56.267
2000	I	0.000	6.541	56.267
	II	0.945	7.486	64.396
	III	0.751	8.237	70.856
	IV	0.789	9.026	77.643
2001	I	0.000	9.026	77.643
	II	0.310	9.336	80.310
	III	0.231	9.567	82.297
	IV	0.177	9.744	83.819
2002	I	0.221	9.965	85.720
	II	0.310	10.275	88.387
	III	0.882	11.157	95.974
	IV	0.468	11.625	100.000
Total		11.191		

Note: A difference of \$0.003 million was noted between the actual loan amount (\$11.188 million) and the loan amount calculated based on quarterly disbursements (\$11.191 million). The difference is in the rounding of the quarterly amounts that may not exactly add up to 11.188 million.

Source: Asian Development Bank.

PROJECT SCHEDULE

Activity	Fiscal Year									
	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002
A Crop Production Support										
1. Civil Works										
2. Equipment and Furniture										
3. Staff Recruitment & Research										
4. On-Farm Extension and Research										
B Livestock Production Support										
1. Civil Works										
2. Equipment and Furniture										
3. Staff Recruitment										
4. Extension Services										
C Credit Provision										
1. Planning and Programing										
2. Credit Delivery										
D Hill Transportation										
1. Civil Works										
Office Buildings										
Enivornment Friendly Roads ^a										
Suspension and Suspended Bridges										
Steel Truss Bridges										
2. Equipment and Furniture										
E Project Implementation Unit										
1. Equipment										
2. Staff Recruitment										
3. Support Services										
F WOMEN'S DEVELOPMENT UNIT										
1. Equipment										
2. Staff Recruitment										
3. Support Services										

————— = Planned , - - - - - = Actual.

^a Originally, this was trail improvements. The December 1999 Review Mission suspended the construction works until April 2000. Survey, investigation, design, and supervision consultant contracts were terminated in June 2000. New construction supervision consultants were mobilized since November 2001.

Source: Asian Development Bank.

ENVIRONMENT FRIENDLY ROADS IMPLEMENTATION ARRANGEMENTS

1. The organizational setup used for environment friendly road (EFR) construction involved district road coordination and monitoring committees (DRCMCs), village road coordination and monitoring committees (VRCMCs), users committees and users groups. A central road coordination and monitoring committee (CRCMC), chaired by the agriculture minister, was also formed later. This was initiated by the members of Parliament from project districts. The project coordinator's office took the sole responsibility for implementing the EFRs and other activities. DRCMCs were formed in all three project districts, under district development committee (DDC) chairs. DDC vice chairs, DDC members, chief district officers, local development officers, national parties representatives, representative technicians of DDCs, and experienced and prominent people nominated by DDCs from among users were the members of the committees. The committees were responsible (at the district level) for coordinating and monitoring entire roads in each district during construction and, after construction was complete, operation and maintenance.
2. VRCMCs were formed under Chairs of village development committees (VDCs). VDC vice chairs, relevant ward members, local representatives of political parties, lady members and prominent people among users are the members of the committees. These committees were responsible (at the village level) for coordinating and monitoring the road stretches in VDCs.
3. Users committees formed VRCMCs through mass meetings of the road users, particularly working groups. Users committees were used for the actual construction works by mobilizing labor groups. Users groups were formed by the users committees from among the users, with priority set as (i) from the same VDCs, (ii) from neighboring VDCs where roads pass, (iii) from remaining VDCs within districts, (iv) from VDCs within the three project districts, and (v) from districts outside the project area. Group leaders headed groups of 15–20 laborers.
4. The Project hired two joint-venture consulting firms: one each for the Okhaldunga-Salleri-Phaplu EFR and Jayaramghat-Halesi-Diktel EFR. They were assigned the task of surveying, investigating, designing, and supervising construction (SIDS) as well as making measurements of the completed works. The SIDS consultants were responsible for day-to-day technical support, supervision, and instruction at site. The roles of the project engineers and subordinate personnel were to manage the SIDS consultants, monitor the works, and certify payments. After termination of the SIDS consultants' contracts, only one consulting firm was hired as construction supervision consultant to supervise the outstanding works of both EFRs.
5. SIDS consultants carried out all technical activities, including stage-related survey and design of EFRs. They also did rate analyses and quantity and cost estimates for the project implementation unit's (PIU) approval. The PIU had authority to approve the estimates on behalf of the Project. The consultants calculated cost estimated for small stretches. The users groups carried out the construction works. Upon the recommendation of VRCMCs, the users committees formally signed agreements with the Project for the construction of road sections. The users committees then engaged a number of users groups, as needed, for the construction activities. The users groups were given defined pieces of works. Payment was made on the basis of actual work carried out and measured, not on a daily wage basis. The consultants supervised the works, checked the quality, and made measurements. The project technician certified the payment against which the Project made payments to users committees. Payments were made to users committees after completion of a road section. The channel of payment was from the Project to users committees, from users committees to users group leaders, and from users group leaders to individual workers.

6. The Asian Development Bank recruited technical assistance consultants to assist Ministry of Agriculture and Cooperative in implementing the hill transport component. The consultants assisted in community mobilization, advised on all technical matters, and supervised and monitored implementation.

7. Technical guidelines and basic characteristics of EFRs are as follows:

- (i) Single lane road that is 4 meters wide, with bypasses every 200 meters, and designed for limited numbers of vehicles per day and trading capacity up to 6 tons maximum (mini trucks and minibuses), with no additional pavement layer.
- (ii) Earthen, fair-weather road that is open to traffic for 8–9 months and closed during the monsoon season;
- (iii) Stepwise construction by gradual widening, allowing natural compaction of soil by seasoning;
- (iv) Local materials, skills, people, tools, and contractors are used whenever possible;
- (v) Bioengineering methods are implemented for the entire road construction;
- (vi) Most construction costs (75–90%) go to labor payments;
- (vii) Heavy equipment or machinery is not used; and
- (viii) Explosives are not used, as far as possible.

8. Environmental guidelines of EFRs are as follows:

- (i) Minimize damage to local vegetation through selection of appropriate construction planning and practices.
- (ii) Introduce revegetation and bioengineering solutions to exposed earth surfaces and landslides.
- (iii) Implement mass balancing during construction, and retain the mass with dry stone and gabion walls.
- (iv) Ensure minimum disturbance of existing infrastructure, such as temples, resting planes, water taps, springs, etc., and integrate these with constructed roads, if possible.
- (v) Discourage settlements at roadside, and encourage the communities to settle at an appropriate distance from roads, to prevent dust pollution and misuse of roads.

9. Social guidelines of construction of EFRs are as follows:

- (i) Increase the self-help capabilities of the people and help overall development through awareness raising and mobilization of group savings.
- (ii) Encourage women to work for pay equal to that of men.
- (iii) Prohibit children under the age of 16 from working.
- (iv) Prohibit alcohol consumption at worksites and in workers' camps.
- (v) Provide first-aid treatment for workers injured while at work.

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference in Loan Agreement	Status of Compliance
1. The Ministry of Agriculture and Cooperative (MOAC) will be the lead project executing agency responsible for overall planning coordination and review of progress and reporting on overall implementation of the Project.	Schedule 5, para. 1	Complied with.
2. MOAC will cause the Department of Agriculture to carry out the physical implementation of Part I A (i) extension; Part I A (ii) adaptive trails and demonstrations; Part I A (iii) seed multiplication and distribution; and Part I A (iv) (a) and Part I A (iv) (c) fertilizer storage godowns and fertilizer promotion.	Schedule 5, para. 1 (a)	Complied with.
3. MOAC will cause the Agriculture Inputs Corporation to carry out the physical implementation of Part I A (iv) (b) fertilizer storage, procurement, and distribution.	Schedule 5, para. 1 (b)	Complied with.
4. MOAC will cause district livestock services office to carry out the physical implementation of Part I B livestock production.	Schedule 5, para. 1(c)	Complied with.
5. The Ministry of Local Development will carry out, through its Women Development Division (WDD), the physical implementation of Part I C women development.	Schedule 5, para. 1(d)	Complied with.
6. The Borrower will cause the Agricultural Development Bank of Nepal (ADBN) and Rastriya Banijiya Bank (RBB) to carry out Part I D of the Project, together with other participating banks, for provision of production credit.	Schedule 5, para. 1(e)	Complied with. Eighteen branch offices of ADBN, RBB, and Nepal Bank Limited provided credit services.
7. The Ministry of Works and Transport will carry out, through the Department of Roads (DOR), the physical implementation of Part II trails and suspension and suspended and steel truss bridges.	Schedule 5, para. 1(f)	Partly complied with. MOAC implemented the component with Department of Roads staff member support. In 1998, the Project Management Office (PMO) structure was revised and MOAC executed through Project Coordinator Office (PCO).

Continued on next page

Covenants	Reference in Loan Agreement	Status of Compliance
8. MOAC shall establish an adequately staffed project implementation unit (PIU) and appoint a qualified project manager acceptable to the ADB to head such PIU. The PIU will be responsible for facilitating planning, coordinating, reviewing progress, and reporting on overall project implementation.	Schedule 5, para. 2	Complied with. The PCO was established in Okhaldhunga. The Project Field Office was established in Khotang. The PIU was established in Solukhumbu.
9. A project coordination committee (PCC) will be established within 6 months from the effective date. Interagency coordination will be achieved at the national level through this PCC. The PCC shall meet as and when necessary but at least twice a year.	Schedule 5, para. 3	Complied with.
10. Field level interagency coordination at the district level in the project area will be achieved through the existing district agriculture production committees. This committees will meet whenever necessary but at least once every 2 months.	Schedule 5, para. 5(a)	Complied with. However, after the midterm review, district project implementation committees were formed.
11. The Borrower will provide joint short-term orientation training for users groups and the functionaries of the Borrower's line agencies, once in the beginning of project implementation and again at intervals during implementation.	Schedule 5, para. 6(a)	Complied with.
12. A duly constituted nongovernment organization (NGO) will be engaged to provide and organize District Voluntary Workers (DVW) to promote training.	Schedule 6, para. 6(b)	Complied with. Involvement of NGOs in project implementation was discontinued in 1995, after the financial comptroller general's office questioned the accountability of funds paid to NGOs for their services. In place of NGOs, the Project appointed community motivators to carry out the work.
13. MOAC will cause the PIU to ensure that DVWs, with the help of community motivators, will help in the formation of users groups, articulation and prioritization of people's needs, etc.	Schedule 5, para. 6(c)	Delayed compliance. After The Special Project Administration Mission, the PCO used district resource people, service center facilitators, and community motivators.

Continued on next page.

Covenants	Reference in Loan Agreement	Status of Compliance
14. MOAC will ensure that users groups are organized for livestock and pasture development and controlled grazing, construction and maintenance of tracks and trails, women development activities.	Schedule 5, para 6(d)	Complied with.
15. Women development units will specifically organize women into users or beneficiaries groups for activities under the Project.	Schedule 4, para. 6(e)	Complied with.
16. The concerned NGOs, under the overall responsibility of PIU, will be accountable for payment of remuneration and honorariums to DVWs and community motivators as well as their training and work output.	Schedule 5, para. 7(d)	Not applicable. Involvement of NGOs was discontinued after 1995, due to an audit objection.
17. The operation and maintenance of project facilities will be the responsibility of the respective line agencies, such as Department of Agriculture (DOA), Department of Livestock Services (DLS), DOR, and WDD, during project implementation. After project completion, the Borrower shall make available adequate funds and staff members necessary to operate the facilities in a timely manner.	Schedule 5, para. 8	Not complied with. Inadequate provision of funds to operate the facilities in a timely manner. Availability of staff members was constrained by the adverse security situation in the field.
18. The officers of concerned district level line agencies, namely the agricultural development officer, district livestock development officer, district women development officer, and district offices of the participating banks, shall forward quarterly progress reports to the project manager.	Schedule 5, para. 9(a)	Complied with.
19. The project manager will consolidate the reports of the three districts in the Project's area and send a consolidated report semiannually to the concerned line agencies at the regional level; planning chiefs of DOA, DLS, and WDD; project director-in-charge of Asian Development Bank (ADB) projects, DOR; and ADB.	Schedule 5, para 9(b)	Complied with.
20. Each of the implementing agencies shall prepare and furnish to MOAC a project completion report for consolidation and submission by MOAC to the ADB within 5 months after physical completion of their respective project components.	Schedule 5, para. 9(c)	Delayed compliance.

Continued on next page.

Covenants	Reference in Loan Agreement	Status of Compliance
21. Project benefit monitoring and evaluation will be undertaken by the PIU under the guidance of the monitoring and evaluation division (MED) of MOAC. MED shall organize an interim review of the implementation of the Project at the end of the second year of implementation.	Schedule 5, para. 10	Complied with.
22. The PIU shall cause the benefit to be evaluated at least once in midterm (i.e., about 4 years after the start of project implementation) and again within 6 months of project completion under ADB-financed technical assistance.	Schedule 5, para. 10(b)	Complied with. Consultants completed their work in December 1998.
23. The Borrower will ensure that the land and land rights required for the construction of project facilities shall be acquired or provided pursuant to the laws of the Borrower in a timely manner so that the Project is implemented in accordance with the agreed implementation schedule.	Schedule 5, para. 11.	Complied with.
24. The Borrower will ensure that no road, track, or trail will be constructed under the Project within Sagarmatha National Park. The crop and livestock production system under the Project will emphasize soil conservation, including grass planting against slopes, pasture development and rejuvenation, stall feeding, and controlled grazing practices.	Schedule 5, para. 12	Complied with.
25. The Borrower will 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; disclose the use thereof in the Project; record the progress of the Project; and 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 project facilities or any part thereof.	Article IV, Section 4.06 (a)	Complied with.

Continued on next page.

Covenants	Reference in Loan Agreement	Status of Compliance
26. The Borrower will cause each implementing agency to: (i) maintain separate accounts for their respective components of the Project; (ii) have such accounts audited annually; (iii) furnish to the ADB not later than 9 months after the end of each related fiscal year unaudited copies of such accounts and financial statements and, not later than 18 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements; 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 reasonably request.	Article IV, Section 4.06 (b)	Complied with.
27. In carrying out the Project, the Borrower will cause competent and qualified 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.	Article IV, Section 4.03 (a)	Complied with.
28. The Borrower will ensure that the project facilities are operated, maintained, and repaired in accordance with sound administrative, financial, engineering, environmental, and maintenance and operational practices.	Article IV Section 4.09	Not complied with. No maintenance plans exist and funds are inadequate to maintain project facilities.
29. The Borrower will ensure that (i) Ministry of Finance (MOF) will, in accordance with the budgeted amount, promptly allocate the required funds to the concerned implementing agencies, to enable them to carry out their respective components of the Project without unnecessary delay; (ii) comptroller general of accounts, upon authorization from MOF, will make available the funds to district treasury and accounts controllers' offices; (iii) district treasury and accounts controllers' offices shall disburse the necessary funds to district offices of concerned line agencies in advance of the ensuing trimester, subject to proper liquidation of earlier advances; (iv) district offices of concerned line agencies will submit the accounts of expenditure for reimbursement and/or adjustment to the comptroller general of accounts.	Schedule 3, para. 11 (a)	Complied with.

Continued on next page.

Covenants	Reference in Loan Agreement	Status of Compliance
30. The Borrower will adopt the statement of expenditures procedure (SOE) for certain disbursements. The imprest accounts will be established, operated, and maintained in accordance with, and the use of the SOE will be governed by, the ADB's guidelines on imprest fund and SOE procedures, dated November 1986, and on such other terms and conditions to be agreed between the Borrower and the ADB.	Schedule 3, para. 11 (b)	Complied with.

ADB=Asian Development Bank; DOA=Department of Agriculture; DLS=Department of Livestock Services; DOR=Department of Road; MOAC=Ministry of Agriculture and Cooperative; MED=monitoring and evaluation division; MOF=Ministry of Finance; PIU=project implementation unit; SOE=statement of expenditures; WDD=Women Development Division.

Source: Asian Development Bank.

TECHNICAL ASSISTANCE COMPLETION REPORTS

Division: Nepal Resident Mission

A. TA 1590-NEP: Women Skills Development

Number and Name TA 1590-NEP: Women Skills Development			Amount Approved \$212,000	
			Revised Amount \$212,000	
Executing Agency Department of Women Development ¹		Source of Funding Technical Assistance Special Fund		Amount Undisbursed \$51,446
				Amount Utilized \$160,553
Approval Date	Signing Date	Fielding of First Consultant(s)	Completion Date	
31 October 1991	14 January 1992	January 1995	Original 29 April 2000 Actual 30 June 2002	
			Account Closing Date	
			Original 29 April 2000 Actual 31 March 2003	
Description				
<p>Women in the Upper Sagarmatha Agricultural Development Project's area suffer from illiteracy, poor sanitation and health, lack of proper child care and education, and lack of skills. Rural women spend a disproportionate share of their time in fetching water, collecting fuel and fodder, and doing arduous tasks. As a result, they are left with little time for income-generating activities. The Government of Nepal requested Asian Development Bank technical assistance to develop and foster entrepreneurial skills of women in the Project's area and facilitate income-generating activities. Accordingly, the technical assistance was formulated concurrently with the Project to support the women development component of the Project through skills training to women and provision of local trainers as well training coordinators. Preparation of the technical assistance completion report took a long time after the technical assistance closed because of the delay in fielding of the Project Completion Review Mission, due to an adverse security situation in the Project's area.</p>				
Objectives and Scope				
<p>The objective of the technical assistance was to provide skills training to the women's groups in income-generating small enterprises as well as in nutrition, child care, sanitation, health, family planning, etc. The scope of the technical assistance was (i) provision of nonformal education and training in skills, leadership, and management development to women's groups; (ii) provision of local trainers, equipment, and teaching materials; and (iii) financing of an international consultant-training coordinator (for 2 person-months) and overseas training fellowships for selected women development section staff members. The technical assistance closing date was extended in conjunction with the Project by 2 years, to 30 June 2002, to maximize the development impacts of the activities under the production support component of the Project by resuming the community mobilization program with the focus on engaging and training women motivators to provide agriculture extension services, especially along corridors of the two environment friendly roads. The technical assistance objective was relevant to the needs of the Government.</p>				
Inputs Evaluation				
<p>The technical assistance was relevant in enhancing women's skills to increase their participation in the Project, and the assistance contributed to the effectiveness of the implementation of the women development component of the Project. Thus the technical assistance design was consistent with its objectives. However, the technical assistance outputs are not clear in the design. An international consultant (training coordinator) was hired for 2 person-months to review training needs of women and women leaders in the project area and identify priority skills improvement training programs. However, the consultant's recommendations were not accepted by the Executing Agency on the grounds of being impractical. Therefore, inputs of a domestic consultant (training coordinator) hired under TA 1591-NEP: <i>Training and Project Benefit Evaluation</i> was used to implement the technical assistance. A domestic consultant with expertise in agriculture and community mobilization was later recruited for 8 person-months to implement the women community mobilization program and training and conduct an impact assessment of the Project's production support component. Both consultants completed their services in line with their respective terms of reference and achieved technical assistance objectives. The performance of both consultants was satisfactory. The technical assistance supported fees for local trainers, equipment, and teaching materials necessary to carry out the women development activities. The technical assistance inputs were constrained by an adverse security situation during the extended period of the technical assistance.</p>				

¹ The EA at the beginning of the technical assistance was the Women Development Division. In 2000, the Executing Agency was renamed the Department of Women Development.

² In May 2001, the Government requested the resumption of the community mobilization program under the technical assistance.

³ ADB. 1995. *Memorandum of Understanding, ADB Loan Review Mission*. Manila.

⁴ ADB. 2002. *Consultant Performance Evaluation Report*. Manila.

A community mobilization program for women was implemented from September 2001 to June 2002, concentrating on vegetable farming, small animal raising, and agroforestry women groups of the village development committees reached by the two environment friendly roads.⁵ A total of 44 women community motivators from 22 village development committees, 5 community facilitators, and 1 program assistant were recruited and worked under the domestic consultant's supervision. Community motivators were given orientation training to acquaint them with the envisaged community mobilization program and their roles and responsibilities. They were also taught about the process and skills to train and mobilize women into groups. Although constrained by the adverse security situation in the field, most of the community motivators and community facilitators worked effectively to fulfill the responsibilities given to them.⁶ Technical assistance activities were closely monitored by the Asian Development Bank through review missions and tripartite meetings attended by the consultants and project manager. The performance of the Asian Development Bank and the Executing Agency was satisfactory.

Outputs Evaluation

The major outputs of the technical assistance included (i) detailed training programs for women of the Project's area, (ii) international training to women development section staff members, (iii) eventual formation of 132 women-led groups in 22 village development committees, (iv) detailed training to women beneficiaries, and (v) adequate preparation of the consultant's end of an assignment report. Overall, the outputs of the technical assistance were in line with the technical assistance objectives.

A total of 37 staff members of the women development section took community mobilization and related training, and 63 line agency staff members participated in workshops on institutional development, microenterprise development and the role of stakeholders for successful implementation of a women development program. Ten assistant level staff members of the women development section⁷ participated in an observation tour to Bangladesh. Three women development officers participated in the Planning and Implementation of Rural Development Project training course in the Philippines. As the participants were mainly field staff members and mostly belonged to the Project's districts, training to the women development section's staff was effective and useful.

During the later part of the technical assistance, the community mobilization program emphasized beneficiary-led institution building. A total of 132 groups (1,989 women farmers) were formed and mobilized by community motivators. This helped women understand the importance of working in groups. Many expressed their determination to continue after the Project. As group formation and training of women farmers were started after the completion of the production support components, the training and group formation under the technical assistance become stand-alone activities. The technical assistance created links between groups and village development committees in the project area. Training to community motivators was too dependent on technical assistance consultants, who were not available after technical assistance completion. Nonetheless, although limited, all targeted outputs of the community mobilization program were achieved.

Overall Assessment and Rating

The technical assistance was rated successful. Training to women development section staff members was effective. Although short in duration, the community mobilization program under the technical assistance helped women farmers become exposed to a number of outside areas and activities. The technical assistance promoted the participation of women in the women development component and hill transport component of the Project effectively.

Major Lessons Learned

Major lessons learned are that (i) training should be an integral part of a learning process of the program, (ii) inputs from the competent international consultant should only be considered if the competent domestic consultants are not available, (iii) observation tours for field-level staff members are effective and useful, and (iv) group formation and training (institutional development) should not be stand alone activities.

Follow-Up Actions and Recommendations

The Executing Agency should build on the existing strength at the group level by strengthening intergroup and district level links. Special attention should be paid to the women development section to address district level links. Intergroup links should be encouraged through increased study tours and intergroup visits.

Prepared by L. Sharma

Designation: Project Officer, Nepal Resident Mission

⁵ Okahldhunga-Phaplu Environment Friendly Road and Jayaramghat-Diktel Environment Friendly Road.

⁶ ADB. 2002. Assignment Completion Report of Community Mobilization Consultant. Manila

⁷ The women development section comprises the field staff members of the Department of Women Development.

B. TA 1591-NEP: Training and Project Benefit Evaluation

Division: Nepal Resident Mission

Number and Name TA 1591-NEP: Training and Project Benefit Evaluation		Amount Approved \$404,000	
		Revised Amount \$404,000	
Executing Agency Ministry of Agriculture and Cooperatives ¹ (MOAC)	Source of Funding Technical Assistance Special Fund	Amount Undisbursed \$14,778	Amount Utilized \$389,222
Approval Date: 31 October 1991	Signing Date: 14 January 1992	Fielding of First Consultant (s) January 1995	Completion Date Original 29 June 2000 Actual 30 June 2002 Account Closing Date Original 29 June 2000 Actual 30 June 2003
Description Building and strengthening the institutional capability of the Government and local institutions through training were considered essential while designing Loan 1114-NEP: Upper Sagarmatha Agricultural Development Project. ² Therefore, technical assistance was approved in conjunction with the Project to assist MOAC in training and developing its long-term project review, evaluation, and impact assessment capabilities. Preparation of the technical assistance completion report took a long time after the technical assistance closed because of the delay in fielding the Project Completion Review Mission, due to an adverse security situation in the Project's area.			
Objectives and Scope The technical assistance was in two parts: training and project benefit evaluation. The main objective of the first part was to train staff members of the Department of Agriculture and the Department of Livestock Services, key farmers, and leaders of local institutions in promoting sustainable agriculture development in the hill ecosystem. The scope included (i) short-term domestic training of key farmers and users groups, village leaders, and project staff members at the central, regional, and district agricultural and livestock training centers and (ii) short-term overseas training for selected staff members of the Department of Agriculture and the Department of Livestock Services. The objective of the second part was to assist the monitoring and evaluation division in developing its long-term project review, evaluation, and impact assessment capabilities. The scope included (i) an in-house review of the Project by the monitoring and evaluation division and (ii) a midterm evaluation and an end-of-term project impact assessment by domestic consultants.			
Inputs Evaluation The technical assistance was designed in conjunction with the Project. Although the technical assistance design was adequate and the terms of reference were clear and comprehensive at approval, significant modifications were made during implementation. For example, the original project design did not include environment friendly roads (EFRs), so no provision was made for related training activities under the technical assistance. After agreeing to include the EFRs in the Project, the technical assistance supported implementation of two ³ EFRs through conducting training in the construction of EFRs and supervision and monitoring of the works of the supervision consultant. While the revised scopes were not directly relevant to the original objectives of the technical assistance, they were consistent with the Project's objectives. Three domestic consultants were procured for 139.5 person-months during the technical assistance implementation period. ⁴ The consultants provided inputs in accordance with their terms of reference and work plans. The performances of all three consultants were rated satisfactory. ⁵ The project management team appreciated the technical assistance consultants' support. Three planning workshops were organized to assess the training needs of government staff members, whereas farmer leader and village development committee official training needs were identified by the application of the participatory rural appraisal method. Institutions for overseas training were identified. The technical assistance consultants prepared a comprehensive training program that included a number of training programs in crop raising and livestock rearing to support the production support components of the Project. Later, in 1998, the scope of the comprehensive training program was expanded and included training to support the hill transport component of the Project, mainly the environment friendly roads. Training focused on skills development of beneficiaries, including the Project's engineering staff members.			

¹ The Executing Agency at the beginning of the technical assistance was the Ministry of Agriculture. In 2000, the Executing Agency was renamed MOAC.

² ADB. 1991. *Upper Sagarmatha Agricultural Development Project*. Manila.

³ Okahldhunga-Phaplu Environment Friendly Road and Jayaramghat-Diktel Environment Friendly Road.

⁴ Training and project implementation consultant (47.0 person-months), senior hill transport consultant (46.0 person-months), and hill transport consultant (46.5 person-months).

⁵ ADB. 2002. Consultant Performance Evaluation Report. Manila.

Technical assistance consultants' inputs were also used to supervise and monitor activities of project consultants hired for survey, investigation, design, and construction supervision. The Executing Agency performed satisfactorily. MOAC appointed a full-time project manager and provided adequate counterpart funding. Technical assistance activities were closely monitored by the ADB through review missions and tripartite meetings attended by the consultants and project manager. Technical assistance administration was carried out adequately by the ADB. The performance of the ADB was satisfactory.

Outputs Evaluation

The technical assistance generated the following reports, and the quality of these reports was satisfactory: reports on quarterly progress; reports on needs assessments, by area and target group; reports on training programs for farmers and nongovernment organization staff members, based on rapid rural appraisals; reports on a comprehensive training program for women's skill development; and reports on guidelines to construct EFRs. Individual consultants submitted their assignment completion reports. These reports contained useful data and chronologies of major project activities but lacked detailed qualitative analysis of technical assistance outcomes and impacts. However, during the implementation of the technical assistance, significant information was reported to the ADB, which was useful for periodic monitoring by the ADB. The Ministry of Finance felt that during the extension period the technical assistance would have been more beneficial if the follow-up support was also provided to beneficiaries.

A benchmark survey of the Project's area was conducted under the technical assistance. To support the production support component of the Project, a total of 16 training programs and 31 workshops and seminars were organized for about 250 government staff members at all levels (including senior officers, junior technicians, and junior technical assistants) and 1,500 farmers. Five line agencies officers were trained in project planning and management in the Philippines and Thailand, one officer was trained in geographical information systems in Thailand, eight officers participated in an observation tour to Bangladesh, and five officers were trained in effective communication for development workers in Thailand. Most of the trained staff members are still with the Executing Agency.

Farmers received training in vegetable cultivation, pasture management, and potato seed production. The participating farmers were reported to have increased family income by growing more and better quality potato seeds and vegetables. Farmers were informed about district agriculture development office and district livestock office programs and the modality of implementing those programs. About 700 beneficiaries of the three project districts received EFR training and more than 7,000 local people (labor) received on-the-job training. Thirteen project staff members received training related to EFRs and trail bridges. Local people acquired knowledge related to alignment selection, mass balance maintenance and its importance, environment friendly applications and their importance, dry wall and gabion wall construction, slope of road embankment and side slope of walls maintenance, surface drainage, cross drainage construction, EFR operation and maintenance, and community participation in construction. On-the-job training produced skilled laborers, particularly in construction of dry-stone and gabion walls. Observations indicate that the trained laborers were employed in other similar construction within and outside the project area.

The Monitoring and Evaluation Division of MOAC undertook the interim review of the project implementation in April 1995 and submitted a report in June of the same year. The Agricultural Projects Services Center undertook a midterm evaluation, and the report was finalized in December 1998. The technical assistance supported preparation of a format for the collection of monitoring information from the line agencies and forwarded the information to the project manager and the Monitoring and Evaluation Division of MOAC. However, this was discontinued when the Project's priority shifted to completion of the two EFRs.

Overall Assessment and Rating

The technical assistance was rated successful. The technical assistance imparted knowledge and skills to beneficiaries at the grassroots level as well as many government staff members. The Asian Development Bank's responsiveness enabled the technical assistance to be reshaped according to the evolving needs of the Project, particularly at the field level.

Major Lessons Learned

Major lessons learned are that (i) on-the-job training is effective in developing skills, (ii) adaptive management should be adopted as an approach during technical assistance implementation, and (iii) technical assistance consultant reports should focus on the impacts of technical assistance outputs.

Follow-Up Actions and Recommendations

No direct follow-up is required by the ADB. However, the Government is expected to continue to effectively use technical assistance outputs for implementing the agricultural development project. The Government could also use the EFR approaches and methodologies when implementing other environment friendly road projects.

Prepared by L. Sharma

Designation: Project Officer, Nepal Resident Mission

MAJOR PROCUREMENTS UNDER THE PROJECT

Item	Type of Contract	No. of Contracts Quantity (Package)	Type of Procurement	Contract Amount (NRs '000)	Actual Paid Amount (NRs '000)
1. Trail Bridge in Solukhumbu District	Turnkey for design, manufacture, and construction	2	LCB	32,922	32,488
2. Trail Bridge in Khotang District	Turnkey for design, manufacture, and construction	2	LCB	26,985	32,140
3. Trail Bridge in Okhaldhunga District	Turnkey for design, manufacture, and construction	2	LCB	36,216	42,174
4. Silaurighat Suspended Bridge	Turnkey for manufacture, and construction	1	LCB	9,197	9,160
5. Dibiligha Suspended Bridge	Turnkey for manufacture, and construction	1	LCB	3,608	3,818
6. Solu Vehicle-Ready Bridge	Civil Works	1	LCB	10,197	11,971
7. Jayaramghat Ferry	Turnkey for design, manufacture, and construction	1	LCB	6,503	6,678
8. Lamidanda-Bijule Road (Ch 8 + 200–Ch 8 + 600)	Civil Works	1	LCB	3,240	7,035
9. Lamidanda-Bijule Road (Ch 8+ 600–Ch 9+660)	Civil Works	1	LCB	3,091	6,067
10. Tools for EFRs	Goods	3	LCB	4,121	4,078
11. High-Density Pipes	Goods	1	LCB	1,950	1,950
12. Gabion Wires for OPEFR (291 metric tons)	Goods	4	LCB	21,196	19,782
13. Gabion Wires for JDEFR (521 metric tons)	Goods	4	LCB	34,044	33,166

Ch=Channage; EFR=environment friendly road; JDEFR=Jayaramghat-Diktel environment friendly road; LCB=local competitive bidding; OPEFR=Okhaldhunga-phaplu environment friendly road.

Source: Final Assignment Report, December 2002, Senior Hill Transport Consultant.

PROJECT BENEFITS

Table A10.1: Summary of Number of Beneficiaries and Area Benefiting from the Project at Full Development

Items	Appraisal Target	Achievement
Total Area Benefiting (hectares)	31,000	22,379
Number of Households Benefiting from		
Crop Production Activities	41,000	31,030
Livestock Production Activities	20,000	17,198
Income-Generating Activities by Women Entrepreneurs	4,500	3,326
Vegetable Production		5,680
Fruit Production		1,920

Note: Similarly, the women entrepreneurs undertaking income-generating activities may also come largely from farming families. Therefore, the total number of families benefiting from the Project, whether from crop, livestock, or women's development, is not less than 31,030.

^a In most cases, the families benefiting from crop production may also benefit from livestock production, as the two activities form part of an integral farm system. Similarly, the women entrepreneurs undertaking income-generating activities may also come largely from farming families. Therefore, the total number of families benefiting from the Project, whether from crop, livestock, or women's development, is not less than 31,030.

Source: Asian Development Bank.

Table A10.2: Foodcrop Production

Items	Incremental Production (metric tons)	
	Target	Achievement
1. Rice	3,270	1,234
2. Wheat	1,484	739
3. Maize	9,572	4,617
4. Millet		597
5. Potato	19,265	9,040
Total Food Crop Production	32,600	16,227

Source: Asian Development Bank.

Table A10.3: Fruits and Vegetable Production

Item	Annual Production (metric tons)	
	Target	Achievement
1. Tropical Fruits		397
2. Citrus		1,261
3. Temperate Fruits		772
4. Summer Vegetable		1,334
5. Winter Vegetable		2,174

Source: Asian Development Bank.

Table A10.4: Distribution of Breeding Stock

Items	Appraisal Target	Achievement
1. Buffalo Bulls	50	238
2. Bulls	25	85
2. Rams	59	156
3. Bucks	63	673
4. Piglets	170	715
5. Cows		20
6. Yak and Nak		112
6. Rabbit		182
Total Improved Breeds	367	2,181

Source: Asian Development Bank.

FINANCIAL AND ECONOMIC ANALYSIS

A. Financial Analysis

1. General

1. The methodology used for the financial analysis follows as closely as possible the one used for project appraisal. Financial analyses were undertaken of both the farm and nonfarm activities, to assess the financial viability of the activities supported under the Project.

2. The Project promoted investment in crop (cereal, fruit, and vegetable) and livestock (cattle, buffalo, goat, pig, and poultry) production. Financial income and returns of project-promoted income-generating activities are computed adopting similar techniques to those used in the appraisal document. For instance, farm income is calculated for all the three types of farm models (valley, midhills, and high hills) adopting the same size criteria as in appraisal and financial analysis. This is done for all types of livestock assisted under the Project, using similar assumptions and techniques. Such analysis was done to review whether the returns were attractive enough for farmers.

2. Input and Output Prices

3. Financial prices of all inputs and outputs are based on published data as well as farm-level data on actual farm gate prices gathered during field studies conducted under the Project. All cash flows are based on June 2002 constant prices, assuming inflation affects costs and returns equally. Interest and loan repayments are fixed in monetary terms at the time loans are made, and the burden of debt service therefore declines in real terms over subsequent repayment cycles. During field studies, the farm gate prices of inputs and outputs is gathered. This was supplemented by the world price of the commodities that are traded internationally. Table A11.1 presents the financial farm gate prices of inputs and outputs used in these analyses.

Table A11.1 Prices Used in Financial Evaluation
(NRs per unit)

Description	Unit	Financial Price
Outputs		
Cereals		
Paddy	metric ton	16,000
Wheat	metric ton	16,000
Maize	metric ton	15,000
Millet	metric ton	17,000
Potato	metric ton	10,000
Vegetables		
Summer	metric ton	8,000
Winter	metric ton	8,500
Fruits		
Tropical Fruits	metric ton	6,000
Citrus	metric ton	5,000
Temperate	metric ton	5,000

Continued on next page.

Description	Unit	Financial Price
Livestock Products		
Milk	liter	30
Meat (live weight)	kilogram	150
Egg	piece	6
Inputs		
Seed and Planning Materials		
Paddy	kilogram	20
Wheat	kilogram	25
Maize	kilogram	18
Millet	kilogram	18
Potato	kilogram	12
Fertilizer		
Urea	kilogram	17
Di-ammonia Phosphate	kilogram	28
Potash	kilogram	16
Pesticide	kilogram or liter	50
Labor	person-day	53
Draft Animal	day	100

Source: Field Survey, Project Completion Review Mission, Asian Development Bank.

3. Agricultural Labor

4. Labor is the one of the most important inputs used by people in the project area for managing agricultural activities. The cost of hired labor was determined as a weighted average of peak and off-peak season wages prevailing in the project area. The use of hired labor varies according to farm size and cropping pattern. To be consistent with appraisal assumptions and in conformity with the field-level situation, 25% of total labor is assumed to be hired and the remaining 75% is assumed to be met through family labor.

5. Agricultural wage rates in the project area vary significantly over cropping months. Reliable data on farm-level wage rates are not available. Hence, the information on farm-level wages was based on the information collected during field studies conducted. In view of the widespread underemployment and unemployment prevalent in the areas, the market wage rates, in general, are assumed to overstate true opportunity cost of labor in the project area. Survey findings revealed that the financial wage rates in the project area vary across districts. However, the rates converge at NRs80 per day in the peak months (March, April, June, and July) and NRs40 per day during lean months (January, February, May, August, September, October, November, and December). To determine the weighted average wage rate, the seasonal variations were averaged out to derive a weighted average financial wage using the length of different seasons, i.e., 4 months as the peak season and 8 months as the lean season (Table A11.2). The weighted average financial wage rate is estimated to be NRs53 per day.

Table A11.2: Deviation of Weighted Average Wage Rate

Season	Wage Rate (NRs per person-day)	Length of Season (months)	Weight
Peak	80.0	4.0	0.33
Lean	40.0	8.0	0.67
Average Weight	53.0	12.0	100.0

NRs = Nepalese Rupees.

Source: Project Completion Review Mission, Asian Development Bank.

4. Cost of Seed and Manure

6. In the project area, with some exceptions, farmers use their own produce for seed. Hence, no cash outlay is necessary for farmers for using these seeds. In view of this, an imputed value of seed was used while creating the financial analysis, because a financial opportunity cost to farmers exists in retaining their own seed. In some case, many of small farmers have to purchase or borrow their seed requirements, and this is true for all, mainly in the case of improved varieties used for crop production. Seed costs were estimated as the farm gate price of crops plus a premium of 25%, to allow for quality, storage, waste, and transport, and this is expected to reflect the reality. Farmyard manure is used quite extensively on all crops, but little is actually traded. Although the appraisal did not consider the cost of manure when performing the financial analysis, an imputed value of manure (NRs20–45 per quintal) was assumed in the financial analysis to reflect that local people add some value for manure in the local economy.

5. Cropping Patterns and Inputs Use

7. The appraisal document assumed three sets of cropping patterns to represent the major agricultural zones, and no increase in the cropping intensity will occur due to project intervention, rather the Project will contribute to ensuring a shift from low-yield local varieties to high-yield varieties and in some cases from low-to-high return crops. The appraisal assumption related to cropping pattern and intensity was quite realistic. Considering the climatic conditions and other biophysical factors, no changes occurred in the cropping intensity in the area, and some changes in the cropping pattern, in the form of the replacement of local varieties with improved ones, was observed. The general shift in crop varieties occurred due to diffusion and extension of the knowledge of new varieties and demonstrations of their benefits.

8. As done in the appraisal document, the impact of the Project on farm incomes was analyzed using the concept of representative farm models. These models reflected the assumption of with and without project situations and model cropping patterns for the three agroecological zones, based on the elevation of valleys (<1200 meters), midhills (12,000–2,400 meters), and high hills (>2,400 meters) in the project area.

9. As done in the appraisal document, three typical farm models were used in this report to make a firm budget analysis (Model I represented valleys with a farm size of 0.45 hectares, Model II represented midhills with a farm size of 1.30 hectares, and Model III represented high hills with a farm size of 3.90 hectares).

10. Human labor, bullock labor, pesticides, and fertilizers are the inputs used by farm households in the project area for promoting production. During field studies, an estimate was

made of current levels of input use for the production of different crops produced in the area under different farm model conditions. The information collected during field studies was used to calculate the cost of production per hectare per crop.

6. Farm Budgets for Cereal Farming

11. Field studies provided evidence of the increased agricultural productivity of the agricultural system in the project area. This increase resulted in an increase in farm income of the families. However, the increase is not highly significant and attractive.

12. Farm income estimates in all three farm models indicate that some increase in the value of production per farm was evident. The appraisal report estimates that the net return will increase almost 100% in the with project situation, compared to the without project situation. The impact of the Project's support designed to increase farm household income was lower than the one estimated during appraisal. Detailed analysis is provided in Supplementary Appendix A. Increase in net farm income in the valley, midhills, and high hills models is 93%, 77%, and 66%, respectively, of the appraisal targets (Table A11.3). A summary of details regarding the farm model analysis is presented in Table A11.4

Table A11.3: Increase in Farm Income

Farm Model	Unit	Net Income in 2002		Achievements (%)
		Target	Actual	
Model 1: Valley	NRs	6,093	5,655	93
Model 2: Midhills	NRs	10,589	8,182	77
Model 3: High hills	NRs	16,743	11,102	66

NRs = Nepalese Rupees.

Source: Project Completion Review Mission, Asian Development Bank.

7. Vegetable Farming

13. Vegetable farming showed an increasing trend in the project area. During project appraisal, vegetable farming was not included in financial and economic evaluation. However, the Project supported the promotion of vegetable farming. Production pockets in and around district headquarters and along tourist routes are visible and quite impressive and encouraging. Vegetables produced in the area are being marketed from periodic markets in the district headquarters. A summary of financial analysis is presented in Table A11.5.

8. Fruit Farming

14. The project area possesses agroclimatic conditions suitable for commercial fruit production, and some production pockets are famous for specific types of fruit crops. Progress achieved on fruit farming during the project period was quite impressive and encouraging. The Project supported the promotion of tropical fruits (mango, banana, guava, papaya, jackfruit, pineapple, and litchi) in the valley; citrus (orange, sweet orange, lime, lemon, etc.) in the midhills; and temperate fruit (apple, pear, peach, and plum) in the high hills. The appraisal document does not include the financial analysis of fruit farming. Financial analysis of fruit farming in the project area (0.05 hectares) was done using firsthand information collected during the field studies. The financial analysis is summarized in Table A11.6. The rate of return is attractive for tropical fruits in the valley. This is followed by citrus farming in the midhills and temperate fruit in the high hills. Details on the financial analysis of fruit farming in the project area are presented in Supplementary Appendix A.

Table A11.4: Summary of Farm Model Analysis for Cereal Crops

Description	Farm Model I			Farm Model II			Farm Model III		
	Without Project	With Project	Increment	Without Project	With Project	Increment	Without Project	With Project	Increment
Farm Size (hectare)	0.45	0.45	0.0	1.30	1.30	0.0	3.9	3.90	0.0
Cropping Intensity (%)	169	169	0.0	146	146	0.0	100	100	0.0
Gross Value of Production (NRs)	8,519	22,871	14,352	17,041	45,208	28,167	29,402	75,240	45,838
Production Cost (NRs)	4,904	17,216	12,312	11,658	3,7026	25,368	21,182	64,138	42,956
Net Value of Production (NRs)	3,615	5,655	2,040	5,383	8,182	2,799	8,220	11,102	2,882

NRs=Nepalese rupees; %=percentage.

Source: Staff estimates.

Table A11.5: Summary of Financial Analysis of Vegetable Farming in the Project Area (NRs per 0.05 hectares)

Production Zone	Crop Categories	Gross Revenue	Production Cost	Net Return
Valley	Summer vegetable	3,500	2,149	1,351
	Winter vegetable	3,400	2,230	1,170
Midhills	Summer vegetable	3,800	2,279	1,521
	Winter vegetable	3,600	2,293	1,307
High Hill	Vegetable	4,050	2,288	1,762

Source: Staff estimates.

Table A11.6: Summary of Financial Analysis of Fruit Farming Enterprise in the Project Area (per 0.05 hectares)

Type of Fruit	Fixed Investment (NRs)	NPV (NRs at 15% discount rate)	BCR	IRR (%)
Tropical Fruit	67,250	281,067	1.54	31
Citrus	69,750	196,588	1.38	27
Temperate Fruit	67,250	104,372	1.18	21

BCR=benefit cost ratio; IRR=internal rate of return; NPV=Net present value; NRs=Nepalese rupees; %=percentage.

Source: Staff estimates, Asian Development Bank.

9. Livestock Activities

15. The project appraisal considered all commercial livestock activities as new enterprises. Appraisal also assumed that the most of the animals would be raised under control grazing or stall-feeding conditions that were partly achieved. The system of raising livestock under a free grazing system is still prevalent in the area. The cost of raising livestock was been determined considering the moderate management capacity of the farmers in the Project's area. Project-supported livestock activities were milch buffalo, milch cow, goat, pig, poultry, buffalo heifer, and cattle heifer. Similar to the appraisal framework and assumptions, various aspects of benefits and costs of the livestock model were assessed to the extent to which the investment in livestock enterprise is profitable in the local context, and a financial viability assessment report was prepared. Details are presented in Supplementary Appendix A. The rate of return on investment in different livestock activities in 2002 and its comparison with the appraisal estimate is presented in Table A11.7. Financial returns were attractive across all activities, confirming that the investments in livestock enterprises were profitable to farmers. Possibilities to increase livestock activities exist in the project area, and they will multiply after the completion of the two environment friendly roads under the Project.

Table A11.7 : Financial Analysis of Livestock Enterprise

Enterprises	Appraisal Estimates		Estimates in 2002	
	Total Investment (NRs)	FIRR (%)	Total Investment (NRs)	FIRR (%)
Milch Buffalo	12,400	36.2	25,200	29.0
Milch Cow	10,000	35.4	19,400	31.0
Buffalo Heifer			13,000	26.0
Cattle Heifer			10,200	24.0
Goat	2,500	46.5	15,960	30.0
Pig	7,100	48.4	13,240	40.0
Poultry	4,000	66.0	12,000	48.0

FIRR=financial internal rate of return; NRs=Nepalese rupees; %=percentage.

Source: Staff estimates, Asian Development Bank.

B. Economic Analysis

16. The economic analysis was carried out for the Project as a whole as well as at the project activities level. The methodology and principal assumptions used in economic analysis are as follows:

1. Prices

17. All inputs and outputs were valued at constant 2002 economic prices. The economic farm gate price of all traded agricultural inputs and outputs are based on 2000–2001 world market prices taken from the World Bank Commodity Forecasts of January 2001. These were adjusted to a 2002 constant level using past inflation trends. Economic farm gate prices were derived by making appropriate adjustments to bring world market prices to the border value,

accounting for the quality differential, and to include border to farm gate costs associated with handling, transportation, processing, and distribution. Other goods and services for which international price projections are not available were also valued at 2002 constant prices, using financial price in 2002. A standard conversion factor of 0.90 was applied to all local costs (materials and draft power) except human labor. In the case of farm labor, a standard conversion factor of 0.53 (consistent with other recent Asian Development Bank project preparatory technical assistance activities in Nepal) was used. Table A11.8 presents the economic price of outputs and inputs used in these analyses.

Table A11.8: Price used for Economic Analysis
(NRs per unit)

Description	Unit	Economic Price
Outputs		
Cereals		
Paddy	metric ton	12,358
Wheat	metric ton	20,602
Maize	metric ton	18,060
Millet	metric ton	15,300
Potato	metric ton	9,000
Vegetables		
Summer	metric ton	7,200
Winter	metric ton	7,650
Fruits		
Tropical fruits	metric ton	5,400
Citrus	metric ton	4,500
Temperate	metric ton	4,500
Livestock Products		
Milk	litre	27
Meat (live weight)	kilogram	135
Egg	piece	6
Inputs		
Seed/planning materials		
Paddy	kilogram	15
Wheat	kilogram	32
Maize	kilogram	22
Millet	kilogram	16
Potato	kilogram	11
Fertilizer		
Urea	kilogram	12
DAP	kilogram	21
Potash	kilogram	24
Pesticide	kilogram	65
	litre	
Labour	person day	28
Draft animals	day	90

Source: Staff estimates. Asian Development Bank.

2. Foreign Exchange Value

18. Considering the prevailing exchange rate of Nepalese rupees to United States dollars, conversion to border prices was made at the rate of NRs75.50 to \$1.00, which was the average exchange rate in 2002.

3. Unskilled Labor Wage Rate

19. Agricultural wage rates vary significantly over the months and across different regions in the project area. Reliable data on farm labor wage rates are not available. Widespread underemployment and unemployment indicates that market wage rates in general overstate the true opportunity cost of labor in the project area. Thus, the seasonal variance was averaged out by using the length of the different seasons as weight in the calculation of wage rates, as done in Table A11.8, and adjusted by a standard conversion factor of 0.53. This is consistent with other recent Asian Development Bank project preparatory technical assistance activities and the appraisal analysis.

4. Investment and Operational Costs

20. All costs associated with the project implementation except production credit, price contingencies, taxes and duties are included in computing investment and opportunity costs. Local costs are expressed in border NRs after applying the SCF of 0.90. All incremental operating costs including additional staff travel and vehicle operations have been included, and the service charges during construction are excluded.

5. Base Year for Analysis

21. Fiscal year 2002 was used as a base year assuming that the project area acquired full development for agriculture and livestock activities in this year.

6. Project Costs

22. Actual project cost was estimated at \$16,357,000. Incremental operating costs to deliver required services and maintain project-generated benefits were estimated at 7% of the Project's total investment cost. This cost is expected for operation and maintenance of project facilities built during the project period.

7. Project Benefits

23. The quantified benefits resulting from the Project's implementation are as follows:

- (i) Cereal crop growth will increase incrementally. Fruit and vegetable production benefits will result from a change in cropping patterns and crop varieties. Higher yields will be caused by the increased application of improved inputs and better cultural practices.
- (ii) Livestock production and increases in the value per head of livestock production will result from improved feeding and breeding and better health care.
- (iii) Environment friendly road and suspension bridge component-related benefits will not be included in the benefit stream, to make the analysis consistent with the appraisal evaluation. The roads are yet to be completed, and bridge benefits tied

to reduced transportation costs were implicit in the assumed farm gate prices of production inputs and outputs.

- (iv) Agriculture and livestock activities are mainly the enterprises promoted under women development components, and these are already included under the agriculture and livestock development component. Therefore, no separate assessment of women development components was made.
- (v) Other indirect project benefits, though substantial and considered most important by the people in the project area, were not included in the analysis because of estimation-related difficulties.

8. Life of the Project

24. The overall remaining economic life of the Project was assumed at 10 years, starting in 2002, considering the expected life as well as the durability of fixed assets and the technical performance of the durables used by the Project.

9. Results of Economic Analysis

25. Economic prices for cereal crops were calculated from farm gate financial prices for outputs and market prices for fertilizer by using standard conversion factors of 0.53 for farm labor and 0.90 for nontraded items. Table A11.9. presents the increase in farm income. As the project area is food deficient as far as agriculture production is concerned, the economic value of incremental production is high in view of the contribution of increased production for ensuring local food security.

Table A11.9: Increase in Farm Income

Farm Model	Unit	Economic Value of Incremental Production
Model 1: Valley	NRs	5,600
Model 2: Midhills	NRs	11,381
Model 3: High Hills	NRs	16,284

NRs = Nepalese rupees.

Source: Staff estimates. Asian Development Bank.

26. The economics of vegetable farming are quite attractive in high hills, followed by midhills and valley (Table A11.10).

Table A11.10: Economics of Vegetable Farming in the Project Area
(NRs per 0.05 hectares)

Production Zone	Crop Categories	Gross Revenue	Production Cost	Net Return
Valley	Summer vegetable	3,000	1,783	1,217
	Winter vegetable	2,975	1,797	1,178
Midhills	Summer vegetable	3,325	1,825	1,500
	Winter vegetable	3,200	1,814	1,386
High Hills	Vegetable	3,600	1,842	1,758

NRs = Nepalese rupees.

Source: Staff estimates, Asian Development Bank.

27. The economic analysis of representative fruit farming in the project area (per 0.05 hectares) was done by adopting approaches similar to the financial analysis but changing all financial prices to economic prices. The result of the economic analysis is summarized in Table A11.11.

Table A11.11: Summary of Economic Analysis Results of Fruit Farming Enterprises in the Project Area

Type of Fruit	Fixed Investment	NPV	BCR	EIRR (%)
	(NRs)	(NRs at a 12% discount rate)		
Tropical Fruit	65,025	312,382	1.88	37
Citrus	65,275	249,923	1.71	35
Temperate Fruit	65,025	187,277	1.49	29

BCR=benefit cost ratio; EIRR=economic internal rate of return; NRs=Nepalese rupees; NPV=net present value.
Source: Staff estimates, Asian Development Bank.

28. The economic internal rate of return (EIRR) and net present value are calculated for the representative livestock model and presented in Table A11.12. The cash flow profiles for all the activities show that the ratio of EIRR to all resources used in livestock promotion in the project area is quite high and economically justifiable. Returns to society related to promoting investment in livestock enterprises is quite attractive in the project area and is economically justifiable in the case of small animals, such as goats, pigs, poultry, and heifers (buffalo and cattle).

Table A11.12: Economics Analysis of Livestock Activities

Livestock Activities	Economic Indicators		
	EIRR (%)	BCR	NPV (NRs at a 12% discount rate)
Milch Buffalo	34	1.1	8,095
Milch Cow	30	1.1	5,209
Buffalo Heifer	45	1.2	11,956
Cattle Heifer	42	1.2	7,475
Goat	62	1.2	12,083
Pig	112	1.2	17,088
Poultry	78	1.4	14,137

BCR=benefit cost ratio; EIRR=economic internal rate of return; NPV=net present value; %=percentage.
Source: Staff estimates.

29. On the basis of the cost and benefit streams, the EIRR for the Project is estimated at 11.9% (Table A11.13). This rate of return can be considered reasonable when the remoteness of the project area and its difficult terrain are taken into consideration. Nonquantifiable but tangible benefits exist in the form of poverty reduction, regional and gender equity promotion, production increases in food deficient areas, and ecological improvements.

30. Sensitivity tests were undertaken to analyze likely impacts on the economic viability of the Project under adverse changes in key variables, such as a reduction in benefits, an increase in capital costs, and a combination of the two. The results of the sensitivity analysis are summarized in Table A11.14.

Table A11.13: Economic Analyses at the Project Level

Descriptions	Year									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Inflow										
Cereal Crops	218,747	218,747	218,747	218,747	218,747	218,747	218,747	218,747	218,747	218,747
Vegetable Farming	12,014	12,014	12,014	12,014	12,014	12,014	12,014	12,014	12,014	12,014
Fruit Farming	(17,433)	(14,189)	(14,034)	(3,933)	13,025	31,857	50,166	65,601	76,418	76,418
Livestock Benefits	(153,685)	53,668	104,008	45,992	64,160	95,689	56,310	56,310	56,310	105,009
Total	59,643	270,239	320,735	272,820	307,945	358,307	337,236	352,671	363,488	412,187
Outflow										
Investment Cost	1,234,954	0	0	0	0	0	0	0	0	0
Incremental Operating Cost	86,447	86,447	86,447	86,447	86,447	86,447	86,447	86,447	86,447	86,447
Total	1,321,400	86,447	86,447	86,447	86,447	86,447	86,447	86,447	86,447	86,447
Net Flow										
Base Case	(1,261,758)	183,793	234,288	186,373	221,498	271,860	250,789	266,224	277,041	325,741
Decline in Benefit 10%	(1,267,722)	156,769	202,214	159,091	190,704	236,029	217,065	230,957	240,693	284,522
Increase in Capital Cost 10%	(1,385,253)	183,793	234,288	186,373	221,498	271,860	250,789	266,224	277,041	325,741
Combination of Declining Benefits and Increasing Costs	(1,391,217)	156,769	202,214	159,091	190,704	236,029	217,065	230,957	240,693	284,522
Base-Case EIRR	11.9%									
Net Present Value	(5,678)									
Net Benefit-Investment Ratio (at a 12% discount)	0.99									
Sensitivity Analysis		EIRR (%)	Sensitivity Indicator							
Decrease in Benefit	0.1	8.4	0.42							
Increase in Capital Cost	0.1	9.7	0.23							
Combination of Decreased Benefits and Increased Costs		6.4	0.87							

EIRR=economic internal rate of return.

Source: Staff estimates, Asian Development Bank.

Table A11.14: Results of Sensitivity Analysis of Economic Results

Assumption	Change in Variable	EIRR (%)	Sensitivity Indicator
Base Case		11.9	
Decrease in Benefit	10%	8.4	0.42
Increase in Capital Cost	10%	9.7	0.23
Combination of Decreased Benefits and Increased Capital Costs		6.4	0.87

EIRR=economic internal rate of return; %=percentage.

Source: Staff estimates, Asian Development Bank.

OVERALL ASSESSMENT

Criteria used in the determination of the overall assessment are relevance, efficacy, efficiency, sustainability, and institutional development and other impacts.

Table A12.1: Quantitative Assessment of Project Performance

Criterion	Assessments	Rating (0–3)	Weight (%)	Weighted Rating
A. Outcome Assessment				
1. Relevance	Relevant	2	20	0.4
2. Efficacy	Partly Efficacious	1	25	0.3
3. Efficiency	Less Efficient	1	20	0.2
B. Sustainability	Less Likely	1	20	0.2
C. Institutional Development and Other Impact	Moderate	1	15	0.1
D. Overall Assessment	Partly Successful		100	1.2

Note: To be classified as highly successful, the overall weighted average (OWA) must be >2.5 , and none of the five criterion can have a score of less than 2. Otherwise, the rating would be downgraded by one level. To be classified as successful, the OWA must be between $1.6 \leq$ and ≤ 2.5 , and no criterion can have a score of less than 1. Otherwise, the rating would be downgraded by one level. To be classified as partly successful, the OWA must be between $0.6 \leq$ and <1.6 , and the number of criteria receiving ratings of less than 1 should not exceed two. Otherwise, the lowest rating would be given. To be classified as unsuccessful, the OWA must be <0.6 .

Source: Project Completion Review Mission, Asian Development Bank