



## Completion Report

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Project Number: 29210  
Loan Number: 1688  
September 2007

### Lao People's Democratic Republic: Shifting Cultivation Stabilization Pilot Project

Asian Development Bank

## CURRENCY EQUIVALENTS

	Currency Unit	–	kip (KN)																
			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 10%; text-align: center;"><b>At Appraisal</b></td> <td style="width: 10%;"></td> <td style="width: 50%; text-align: center;"><b>At Project Completion</b></td> </tr> <tr> <td></td> <td style="text-align: center;">22 July 1998</td> <td></td> <td style="text-align: center;">31 December 2006</td> </tr> <tr> <td style="text-align: right;">KN1,000</td> <td style="text-align: center;">=</td> <td style="text-align: center;">\$0.23</td> <td style="text-align: center;">\$0.103</td> </tr> <tr> <td style="text-align: right;">\$1.00</td> <td style="text-align: center;">=</td> <td style="text-align: center;">KN4,300</td> <td style="text-align: center;">KN9,672</td> </tr> </table>		<b>At Appraisal</b>		<b>At Project Completion</b>		22 July 1998		31 December 2006	KN1,000	=	\$0.23	\$0.103	\$1.00	=	KN4,300	KN9,672
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## ABBREVIATIONS

ADB	–	Asian Development Bank
BME	–	benefit monitoring and evaluation
EIRR	–	economic internal rate of return
ha	–	hectare
km	–	kilometer
Lao PDR	–	Lao People's Democratic Republic
LRM	–	Lao People's Democratic Republic Resident Mission
NR6	–	national route no. 6
O&M	–	operation and maintenance
PCR	–	project completion report
PGH	–	provincial government of Houaphan
PIO	–	project implementation office
PSC	–	project steering committee
TLUC	–	temporary land use certificate
UNODC	–	United Nations Office of Drugs and Crime (formerly United Nations Office of Drug Control)
VDC	–	village development committee

## NOTES

- (i) The fiscal year (FY) of the Government ends on 30 September.
- (ii) In this report, "\$" refers to US dollars.

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## BASIC DATA

### A. Loan Identification

1.	Country	Lao People's Democratic Republic
2.	Loan Number	1688-LAO(SF)
3.	Project Title	Shifting Cultivation Stabilization Pilot Project
4.	Borrower	Government of the Lao People's Democratic Republic
5.	Executing Agency	Provincial government of Houaphanh
6.	Amount of Loan	SDR4,101,000
7.	Project Completion Report Number	PCR:LAO 992

### B. Loan Data

1.	Appraisal	
	– Date Started	7 July 1998
	– Date Completed	22 July 1998
2.	Loan Negotiations	
	– Date Started	15 March 1999
	– Date Completed	16 March 1999
3.	Date of Board Approval	11 May 1999
4.	Date of Loan Agreement	15 July 1999
5.	Date of Loan Effectiveness	
	– In Loan Agreement	13 October 1999
	– Actual	15 October 1999
	– Number of Extensions	0
6.	Closing Date	
	– In Loan Agreement	31 December 2005
	– Actual	4 May 2007
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	1.5%
	– Maturity	32 years
	– Grace Period	8 years

#### 8. Disbursements

##### a. Dates

Initial Disbursement	Final Disbursement	Time Interval
24 Jan 2000	3 April 2007	86 months
Effective Date	Original Closing Date	Time Interval
11 November 1999	31 December 2005	73 months

b. Amount (\$'000)<sup>a</sup>

Category or Subloan	Original Allocation	Last Revised Allocation <sup>b</sup>	Amount Disbursed	Undisbursed Balance
01A Civil Works	1,900.0	1,685.9	1,719.4	(33.4)
02 Vehicles, Equipment, Materials	672.0	549.4	550.1	(0.7)
03 Consulting Services	1,676.0	2,360.5	2,258.4	101.2
04 Training and Study Tours	441.0	298.6	325.1	(26.6)
05 Government Field Travel, Allowances	192.0	152.5	137.8	14.7
06 Vehicles and Equipment O&M	259.0	389.0	441.1	(52.1)
07 Interest Charges	242.0	196.8	205.1	(8.4)
08 Unallocated	218.0	10.0	0.0	10.0
<b>Total</b>	<b>5,600.0</b>	<b>5,642.8</b>	<b>5,637.1</b>	<b>4.7</b>

( ) = negative, O&M = operation and maintenance.

<sup>a</sup> The conversion rate of SDR to US dollar was 1.366 for the original allocation and 1.376 as of 28 February 2007.

<sup>b</sup> The most recent reallocation was December 2005.

9. Local Costs (Financed)	
- Amount (\$ million)	2.6
- Percent of Local Costs	57
- Percent of Total Cost	62

**C. Project Data**

## 1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	3.7	4.6
Local Currency Cost	5.1	4.6
<b>Total</b>	<b>8.8</b>	<b>9.2</b>

## 2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
<b>Implementation Costs</b>		
Asian Development Bank Financed	5.4	5.4
United Nation Office of Drugs and Crime Financed	1.3	2.1
Borrower Financed	1.8	1.4
Beneficiary Financed	0.1	0.1
<b>Total</b>	<b>8.6</b>	<b>9.0</b>
<b>Interest during Implementation Costs</b>		
Borrower Financed	0.0	
Asian Development Bank Financed	0.2	0.2
<b>Total</b>	<b>8.8</b>	<b>9.2</b>

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

Component	Appraisal Estimate	Actual
Capacity Strengthening		
Land Use Planning and Land Allocation	170.8	582.3
Agriculture and Forestry Services	60.1	1,182.2
Diversified Sedentary Farming Systems Development	1,292.6	1,965.2
Village-Based Development	859.8	493.1
Rural Infrastructure	471.0	2,983.7
Project Management	313.9	1,613.5
Interest during Implementation	241.7	333.2
<b>Total</b>	<b>8,821.1</b>	<b>9,153.2</b>

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with PIO Consultants	December 1999	28 June 2000
Date of Contract with M&E Consultants	—	13 Aug 2002
<b>Works Contracts</b>		
Civil Works Contract: Nam Ven Market		
Date of Award		February 2002
Completion of Work		August 2002
Civil Works Contract: Nam Ham Market		
Date of Award		February 2002
Completion of Work		August 2002
Civil Works Contract: Ban Saleuy Market		
Date of Award		October 2002
Completion of Work		January 2003
Civil Works Contract: LDCs		
Date of Award		April–May 2000
Completion of Work		September 2000
Civil Works Contract: Nam Ham Road		
Date of Award		January 2003
Completion of Work		July 2004
Civil Works Contract: Nam Ven Road		
Date of Award		January 2003
Completion of Work		July 2004
Civil Works Contract: Hoaitang School		
Date of Award		15 July 2006
Completion of Work		22 August 2006
Civil Works Contract: PIO Building		
Date of Award		May 2000
Completion of Work		August 2000
Civil Works Contract: National Agriculture and Forestry Research Institute		

Date of Award	April 2001
Completion of Work	June 2001
Civil Works Contract: LDC Nam Ham	
Date of Award	May 2000
Completion of Work	September 2000
Civil Works Contract: LDC Nam Ven	
Date of Award	May 2000
Completion of Work	November 2000
Civil Works Contract: Vet Lab	
Date of Award	September 2001
Completion of Work	May 2002
Procurement of Equipment and Supplies	
First Procurement	19 April 2000
Last Procurement	21 November 2003

LDC = local development center , M&E = monitoring and evaluation, PIO = project implementation office  
 — not available .

#### 5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From January 2000 to December 2000	Satisfactory	Satisfactory
From January 2001 to December 2001	Satisfactory	Satisfactory
From January 2002 to March 2002	Partly satisfactory	Satisfactory
From April 2002 to June 2002	Partly satisfactory	Partly satisfactory
From July 2002 to September 2002	Satisfactory	Satisfactory
From October 2002 to December 2002	Satisfactory	Satisfactory
From January 2003 to December 2003	Satisfactory	Satisfactory
From January 2004 to December 2004	Satisfactory	Satisfactory
From January 2005 to December 2005	Satisfactory	Satisfactory
From January 2006 to December 2006	Satisfactory	Satisfactory

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

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
Inception	28 Aug–6 Sep 1999	2	20	b, d
Review Mission No. 1	23 Jan–2 Feb 2001	3	33	b, h, i
Review Mission No. 2	21–25 May 2001	3	15	b, h, i
Review Mission No. 3	14–18 Oct 2001	2	10	b, d, i
Review Mission No. 4	25–29 Nov 2001	3	15	b, d, i
Review Mission No. 5	25–28 Feb 2002	3	12	b, h
Review Mission No. 6	17–25 Jun 2002	3	27	b, h, i
Midterm Review Mission	25 Nov–6 Dec 2002	3	39	b, h, i
Review Mission No. 7	26–29 Mar 2003	2	8	b, h, i
Review Mission No. 8	19–23 Apr 2004	2	10	b, i, j
Review No. 9 - Handover	10–12 Oct 2005	3	9	a, b, h, i
Review Mission No. 10	19–24 Mar 2006	3	18	a, b, h, i
Review Mission No. 11	30 Oct–3 Nov 2006	3	15	a, b, h, i
<b>Total</b>		<b>35</b>	<b>231</b>	
Project Completion Review <sup>a</sup>	16–28 Feb 2007	2	24	a, b, h, i,

a - engineer, b - financial analyst, c - counsel, d - economist, e - procurement specialist, f - control officer, g - programs officer, h - project officer, i - project implementation officer, j - natural resource specialist.

<sup>a</sup> The project completion report was prepared by Sisavanh Phanouvong, Project Implementation Officer, Lao Resident Mission. Consultation with United Nations Office of Drugs and Crime was conducted during the project completion report Mission.



## I. PROJECT DESCRIPTION

1. Shifting cultivation is the traditional agricultural practice used by upland rural inhabitants in northern Lao People's Democratic Republic (Lao PDR) to achieve rice sufficiency. With increasing population density, traditional rotations have been shortened resulting in the loss of soil fertility, increased weed infestation (with associated increased labor requirements), and loss of secondary forest. The consequence has been declining yields and farmer incomes (increased poverty), and a loss of biodiversity. Shifting cultivators also suffer isolation because of their limited access to markets, health and education services, and clean water supplies. Consequently, they are among the poorest groups in the country. The Government has adopted a policy of reducing shifting cultivation in favor of more sedentary farming systems. To achieve this, smallholders need to find alternate livelihood sources from their traditional upland production systems. The Project piloted different agricultural production technologies to support the sedentarization<sup>1</sup> of upland rural inhabitants to diversify household incomes and improve overall socioeconomic conditions.

2. Project objectives in the 52 target villages (increased from 49 during implementation) were to (i) establish diversified sedentary farming systems as alternatives to shifting cultivation, (ii) provide basic rural infrastructure in an environmentally sound manner, (iii) implement village planning and land allocation, and (iv) eliminate opium production.

3. To achieve these, five components were developed: (i) institutional strengthening and capacity building, (ii) promotion of diversified sedentary farming systems, (iii) village-based development, (iv) provision of rural infrastructure, and (v) project management. The first component targeted land use planning and allocation, (i) developing and piloting more appropriate procedures for land allocation, (ii) establishing provincial and district land use planning teams, and (iii) strengthening the capacity of the Ministry of Agriculture and Forestry for natural resource data management through training and combining policy implementation with planning for natural resource management using geographic information systems. Under this component, the Project also developed training facilities, provided equipment and materials, supported domestic and international training for government staff in agricultural extension and agricultural and fisheries production.

4. The second component, diversified sedentary farming systems, comprised mainly consulting services to provide technical support for project initiatives in diversified sedentary farming systems and to interpret results from on-farm trials to evaluate promising varieties/species, technologies, and improved farming systems. The consultants also provided general support for project implementation given the relative inexperience of the Executing Agency, the provincial government of Houaphanh (PGH), with internationally funded development projects. The third component, village-based development, focused on establishing and supporting mechanisms and developing village capacity to enable smallholders to assume responsibility for land use management; and providing small-scale infrastructure to improve socioeconomic conditions, including irrigation, water supplies, sanitation, village tracks, and village saving and credit schemes based on villager-identified needs as expressed in village development plans.

5. The fourth component, rural infrastructure, involved rehabilitation of an existing alignment and construction of a new road, together with associated markets to improve access

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<sup>1</sup> Sedentarization in this context refers to the process of local residents settling in all year habitats and practicing permanent agriculture, as opposed to shifting cultivation.

to district markets, and health and education services within and outside the target area. The final component, project management, established and resourced the management structure to implement the Project including an office complex, vehicles and equipment, and incremental staff, together with the necessary travel and per diems for local government staff to assist in implementing the Project.

## II. EVALUATION OF DESIGN AND IMPLEMENTATION

### A. Relevance of Design and Formulation

6. The design was highly relevant as it attempted to address the key concerns of the national Government as expressed in its national development plan for reducing poverty and improving access to public services (health and education), while providing economic opportunities to remote upland communities. The main thrust of the design was to improve access while simultaneously promoting more sedentary farming systems that could generate increased household incomes and provide for the management of communal resources from which extractive activities could be sustained. The design was therefore highly relevant and timely as the Government was eager to pilot alternative farming systems to allow more sedentary upland farming systems.

7. The design was consistent with the Government's New Economic Mechanism initiated in 1986 with the main goals of economic stability and increased market orientation. The mechanism achieved considerable success from increased foreign investment and export expansion. The country's rural development policy targeted equitable growth for all citizens, while maintaining the integrity of its natural resource base. The development of the country's rural population was seen as the means to reduce poverty, partly by improving access to commercial opportunities and other public services. Since 1976, the Government addressed the challenge of shifting cultivation, its initial solution leading to the resettlement of upland villages in new, more accessible locations. More recently, its policy developed to incorporate in-situ initiatives aimed at sedentarization, and this Project provided the opportunity to pilot a new approach through natural resource management.

8. When the Project was designed, the country strategy and program of the Asian Development Bank (ADB) for the Lao PDR targeted (i) sustainable economic growth through infrastructure development connecting feeder roads to the main road network, markets, and other commercial opportunities, thereby impacting the domestic economy; and (ii) policy and institutional development necessary to convert aggregate income growth into balanced, shared, and sustained growth.<sup>2</sup> ADB was also eager to support private sector participation in overall economic activity, but more specifically to promote the inclusion of ethnic groups in mainstream economic activity. Consequently, ADB's country strategy and program was directed at rural inhabitants in an attempt to increase their participation in the market economy and to stabilize cultivation systems that were then recognized as unsustainable. Given the common objectives of the Government and ADB, the design components were highly relevant and provided an opportunity to study the impact of land allocation and community empowerment on sustained management of natural resources; previously this was not considered a means for reducing shifting cultivation farming practices.

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<sup>2</sup> ADB. 2001. *Country Strategy and Program (2002-2004)*. Manila.

## **B. Project Outputs**

9. Project outputs were monitored against a baseline survey (after 2004) and other data collected before project start-up (Appendix 1). They were subsequently monitored on an annual basis. Components have either directly or indirectly contributed to a very positive impact on the livelihoods of the inhabitants of the 52 target villages. The roads have provided opportunities to diversify income sources and increased prices for agricultural goods, quite apart from allowing improved access to health and education services. A critical part of the assistance was the provision of seed capital to diversify income-generating alternatives (usually livestock and weaving). This has generated additional income to allow the purchase of rice from local markets (reducing the need for shifting cultivation). The impact is confirmed by a 140% increase in household gross domestic product, a 58% reduction in poor households, a 55% reduction in households with rice shortages even though the area of swidden cultivation decreased from 1,200 hectares (ha) shifting cultivation to 507 ha permanent cultivation in designated areas, plus 12 ha outside the designated areas (irrigated paddy areas have increased from 54 ha to 319 ha). Income from weaving and handicrafts increased by 400%; and the number of large ruminant livestock increased by 100%, poultry by 88%, pigs by 66% and goats by 188%. In addition the area of opium cultivation has been reduced from 724 ha to zero, and the number of addicts reduced from 230 to 36. The project framework presents the target outputs and outcomes as intended in the original design (Appendix 2).

### **1. Institutional Strengthening and Capacity Building**

10. The Project established an office for integrated management of land and natural resources, which has been renamed the National Agriculture and Forestry Research Institute, where the country's land use database is maintained, and training in geographic information systems is provided. The Project undertook land use planning and land allocation using participatory techniques in 52 villages. This involved delineating village boundaries, identifying zones for the various types of land use,<sup>3</sup> and allocating land parcels to individual households. Some 495 households (of the target number of 2,259) received temporary land use certificates (TLUCs)<sup>4</sup> covering 221 ha in 30 villages. The capacity building involved the training of land allocation teams in techniques used in boundary identification, village participatory land use planning to identify land use zones, and preparation and processing of land use applications and plans including forestland agreements and the rights and responsibilities of villagers.

11. The Project provided more than 250 training courses, workshops, and study tours; about 25% were directed at provincial and district government staff and the balance at village-based personnel. Both technical and communication skills were developed among participating agency staff who were able to test their new skills within the project area. Veterinary diagnostic facilities were established in Houaphanh to provide identification of parasitic infestations and basic diseases of livestock.

### **2. Diversified Sedentary Farming Systems Development**

12. On-farm demonstrations of sustainable technologies were conducted by the Project covering animal health and nutrition; fruit tree establishment and management; and cropping

<sup>3</sup> Zones included production forest, protected forest, upland agricultural areas, and paddy areas.

<sup>4</sup> TLUCs were issued for 3 years to individual farmers to undertake specified agricultural production activities and remained valid throughout the 3-year period while the agreed land use was practiced. Failure to observe the specified use resulted in cancellation of the TLUC. The Project was responsible for introducing options to extend the user rights beyond 3 years.

techniques in upland and paddy areas covering land preparation, fertilizer application, and pesticide use. Trials were conducted on 192 ha of cropping land, 25 small livestock groups (mainly pigs, chickens, and goats), 16 fish ponds (34.4 ha), fish raising in rice fields (69.8 ha), 20 pasture demonstrations covering 8.3 ha for animal feed, and 16 demonstrations for nontimber forest products.

### **3. Village-Based Development**

13. The Project established and equipped two local development centers. It provided support for the establishment and training of village development committees (VDCs), which identified and coordinated village development initiatives. It established or rehabilitated 11 permanent irrigation schemes (118 ha) and 20 semipermanent schemes (91 ha) by project completion. It established or rehabilitated 52 gravity-fed water supply schemes; 1,457 pit latrines in target villages; and 76.9 kilometers (km) of rural tracks (average cost of approximately \$4,270/km), including four suspension bridges to connect 37 remote villages to the road network. The Project also established 56 village savings and credit groups targeting the poor and provided training in their establishment and operation providing seed capital of KN1,631 million.

### **4. Rural Infrastructure Development**

14. The Project established two rural access roads to provide access from national route no. 6 (NR6) into both Nam Ven and Nam Ham project areas, including three concrete bridges. The total length of 55.8 km<sup>5</sup> was constructed at an average cost of \$24,700/km. The Project either established or rehabilitated 15 schools (primary grades 1–4) and three market structures, one in each target project area and one along NR6 at Baan Saleuy. A list of the main civil works completed under the Project is presented in Appendix 3.

### **5. Project Management**

15. A project implementation office (PIO) was established in Xam Neua, equipped and staffed to coordinate the Project under the direction of the national project director and project steering committee (PSC). Training for local staff in project management was provided by consultants engaged under the Project. A summary of capacity building initiatives undertaken by the Project is presented in Appendix 4.

## **C. Project Costs**

16. Costs at appraisal were estimated at \$8.8 million: \$3.7 million in foreign exchange (42%) and \$5.1 (58%) local currency. ADB provided a loan of \$5.6 million to cover the entire foreign exchange cost, excluding the foreign exchange costs financed by United Nations Office of Drugs and Crime (UNODC), including the service charge on the loan of \$0.2 million and local currency costs of \$2.5 million equivalent. The Government was to provide counterpart funding of \$1.8 million equivalent to cover taxes waived on imported vehicles and equipment (estimated at \$0.3 million), and government staff travel allowance and salaries representing 21% of total costs. Cofinancing by UNODC was estimated at \$1.3 million, 15% of total costs; the beneficiaries were to finance \$0.1 million as labor associated with village infrastructure development. The actual cost at loan closure (Appendix 5) was \$9.2 million comprising about \$4.6 million in foreign exchange and \$4.6 million equivalent of local currency. ADB funded

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<sup>5</sup> The total length at original design was 55.4 km

\$5.6 million or 61.6% of the total costs; UNODC funded \$2.1 million for credit-related initiatives and village development support amounting to 22.9% of the total project costs; the Government contributed \$1.3 million (14.3% of total costs); and the beneficiaries \$0.1 million (1.2%).

#### **D. Disbursements**

17. Disbursements were slower than anticipated due to lack of familiarity with ADB procurement procedures and limited project management experience in Houaphan (Appendix 6). The consultants were recruited about 12 months after loan effectiveness; this delay resulted in the slower disbursements, given the relative inexperience of PGH. It was also due in part to ambitious implementation targets for Nam Ven and Nam Ham roads that were to have been completed by the end of 2002. The initial design and tendering processes were complicated by environmental concerns that took time to resolve and the main access roads were not completed until the latter part of 2004. Consequently, the larger contracts (accounting for 20% of the total cost) extended later into implementation than anticipated, significantly delaying disbursements. The intended cumulative disbursement rate was for annual drawdowns from 2000 to 2006 of 47%, 55%, 61%, 89%, 95%, and 100% compared to the achieved disbursement rate of 14%, 32%, 42%, 61%, 87%, and 100%. While the imprest account system was adopted for most of the smaller items, payment of major contracts used direct payment from the loan account.

#### **E. Project Schedule**

18. The delay in appointing the implementation consultants and those associated with the road design were the main influences that affected the implementation schedule. The roads were the key factor in opening the area to commercial opportunity and also in accessing public services (aided by village tracks); little could be achieved in stabilizing cultivation systems until road access was secured. Initial road design work exceeded the standards intended by ADB and this had both cost and environmental repercussions, delaying tendering and construction while environmental and resettlement concerns were resolved. The demonstrations of stabilized cropping systems were delayed significantly and the full impact from new production technologies and introduced diversified crops are considered to be still forthcoming. Secondly, the delayed appointment of the UNODC consultants resulted in a significant delay in the appointment and training of VDCs, which then impacted community capacity building and social development initiatives such as village development plans. These were only completed by the end of 2003 instead of 2001 after the appointment of the UNODC consultants in 2001. The early delays could only be rectified by extending the closing date by 12 months to December 2006.<sup>6</sup> The other influence on the implementation schedule was the response time for various approvals needed for funding. Seven different ADB officers were involved during the 6 years of implementation; these frequent changes resulted in understandable delays in issuing approvals.

#### **F. Implementation Arrangements**

19. The Lao PDR Government, represented by the Ministry of Finance, was the Borrower, and PGH was the Executing Agency. The Project was implemented through the Provincial Committee for Rural Development, which also acted as the PSC (Appendix 7). One of the innovative features of implementation was the adoption of decentralized management with funds being transferred directly from the ADB loan account to an imprest account under the name of the Ministry of Finance at the Bank of the Lao PDR, which then channeled the funds to a project subaccount in Xam Neua, without going through any national technical line agency.

<sup>6</sup> The extension of 1 year was granted by ADB in December 2005. It required the reallocation of available funds between categories and the financing of a greater amount of local costs than was previously intended.

This was intended to reduce cumbersome administrative arrangements for transferring loan funds to the province, as the Project was to be implemented only in Xam Neua District. With regard to the overall structure of implementation arrangements, no direct links were established with any national agency such as the Ministry of Agriculture and Forestry and its National Office for Forest Inventory and Planning, or its Soil Survey and Land Classification Centre under the Department of Agriculture and Extension. For this reason, the communication linkages and technical support from national institutions were tenuous at best, even though PIO staff were seconded from the provincial agriculture and forestry office. Project staff worked hard to develop and maintain national–provincial communications and involved national government representatives in all major reviews.

### **G. Project Management and Coordination Arrangements**

20. PGH established the PIO in Xam Neua under the Provincial Committee for Rural Development with responsibility for day-to-day implementation of the Project; coordination with the relevant provincial services and agencies; supervision of the consultants; accounts, administration, and finance of the Project; reporting of physical implementation progress; procurement of civil works, vehicles, and equipment; and overall monitoring and evaluation of the Project. The PIO was managed by a national project director; two deputy directors; administration and accounts personnel; and 10 technical specialists with expertise in the preparation of tender documents, bid evaluation, contract supervision, technical advice for on-farm demonstrations, and coordination of government training programs. Secretarial staff for the PIO were provided by the Office of the Governor on a contractual basis.

21. Much of the technical inputs were provided by the consulting services in view of the limited capacities in the provincial technical line agencies. While counterpart staff were encouraged to work with the consultants for on-the-job training and to gain from technology transfer, much of this impact was not realized because of local capacity, lack of per diems from the provincial government, and the need to complete the work in the quickest possible time given the early delays.

22. The PSC comprised representatives of the main provincial departments including agriculture and forestry; communication, post, transport, and construction; health; education; and finance as well as the Xam Neua district governor. The provincial commission for drug control was also represented on the PSC to assist in coordinating other drug control initiatives. The PSC was chaired by the vice governor and met at regular intervals during project implementation. With the new horizontal lines of responsibility in the Lao PDR, provincial technical agencies were under the control of the provincial governor's office, although agency staff still receive technical support from their equivalent national ministry. Without direct involvement of any national line agency, this support was tenuous, particularly when the piloted technologies were intended to have nation-wide application for future policy development. As a consequence of the implementation structure, national agencies were not always informed of what strategies the Project was piloting and were not directly involved in evaluating their application and impact. As such, the national policy-making institutions and technical implementation agencies were not always familiar with project outcomes. The project management structure is presented in Appendix 7.

### **H. Conditions and Covenants**

23. The loan was declared effective in November 1999, 1 month later than scheduled because of the requirement for confirmation of the UNODC grant. The Government complied fully with most loan covenants apart from two partial compliances in respect of maintenance of

infrastructure and the requirement for a baseline survey (Appendix 8). Schedule 6, para. 8 of the Loan Agreement required that PGH ensure proper operation and maintenance (O&M) of rural access roads by allocating the necessary funds in its annual budget. Given the financial resources of the province, O&M expenditure receives low priority when allocating scarce budget resources. Attempts were made to mobilize village resources to maintain sections of the road for which they clearly have an interest in sustaining as a functioning access route. Inspection of the road during the Project Completion Review Mission revealed a number of obvious areas where immediate maintenance was needed: failing shoulders, poor drainage resulting in surface failure, and one isolated incidence where the axle-load of timber trucks exceeded the designed capacity (para. 27). Landslides also threaten to isolate villages in areas with steep topography. Ongoing routine maintenance that has not fully been met by villager contributions is needed, yet the province has only partially attended to its obligation under the Loan Agreement. The second partial nonconformity concerns the benchmark survey. This was intended to provide the basis for comparison of the socioeconomic conditions among beneficiaries to assess overall project impact. The survey was not undertaken until 2004 and district statistics were used to assess the overall project impact. In view of the fact that the road was only completed in 2003, this delay was not considered critical in assessing project benefits, since few benefits had accrued by the time of the survey other than labor savings associated with water supply establishment.

## **I. Consultant Recruitment and Procurement**

### **1. Implementation Consultant Recruitment**

24. Three groups of consulting were recruited under the Project; two were funded by ADB (the implementation consultants, and monitoring and evaluation consultants), and the third by UNODC (focusing on drug-related issues and grassroots implementation). The implementation consultants were recruited by the PIO in accordance with ADB procedures using two-stage procedures: a technical proposal followed by negotiations with the highest scoring proponent. Recruitment was delayed 12 months after loan effectiveness. The consultants were mobilized in August 2000. The contract provided for 72 person-months of international specialists and 115 of national specialists; the actual inputs were 79 person-months of international and 115 of national after two contract variations. The monitoring and evaluation consultants and UNODC-funded consultants were also recruited in accordance with required procedures. The chief technical adviser and other specialists funded by UNODC were recruited by UNODC in a timely manner and worked alongside the implementation consultants in the PIO. The intended UNODC funded inputs were 324 person-months (international) while the actual inputs were 414 person months (156 international and 258 national). Consultant inputs are presented in Appendix 9.

### **2. Civil Works, Vehicles, and Equipment**

25. Civil works contracts were awarded for two local development centers in 2000, three markets in 2002, and the roads in 2003, using local competitive bidding procedures in accordance with ADB requirements. The construction of intervillage tracks was completed using mobilized local labor, which UNODC had demonstrated to be cost-effective in previous development work; as such, no contracts were issued. The equipment (Appendix 10) was procured using competitive bidding procedures that were open and fully accountable with the exception of procurement of the veterinary laboratory, which had irregularities in bidding procedures whereby bidders were selectively requested to revise their proposals. After this experience and the increased familiarity with ADB requirements, full compliance followed.

## **J. Performance of Consultants, Contractors, and Suppliers**

26. The performance of the implementation consultants was considered satisfactory. After an initial period of poor coordination with the UNODC-funded consultants, the implementation consultant team leader was changed and implementation performance improved. Other international specialists were experienced in the Lao PDR and those with basic language skills were more effective in technology transfer. The performance of national specialists was more varied but they were able to provide the necessary linkage between the international specialists and provincial counterpart staff. The performance of the chief technical advisor and other national staff engaged under UNODC were considered satisfactory and contributed in a positive manner to the outcome of the village development initiatives undertaken by the Project.

27. The contractors for the construction of the two roads demonstrated some reluctance to attend to the environmental safeguards, but eventually proceeded in accordance with the contract under the supervision of the environment specialist. The quality of road construction is considered adequate, although the steep terrain has resulted in landslides that threaten to close the road each rainy season. Surface compaction was adequate for the axle-loads intended, although logging trucks have damaged the surface in certain locations. These are not considered issues for construction and do not reflect on the quality of works completed by the contractors. PGH is assisting by introducing provincial regulations requiring logging companies to undertake proper road maintenance.

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

28. In accordance with Schedule 3 of the Loan Agreement, PGH was to finance 12% of buildings, roads, and markets; 5% of village infrastructure; and 20% of government staff field travel and allowances. While taxes and duties constituted a significant proportion of the first two items, staff field allowances were real cash costs and were to have been allocated from the provincial budget. During the early stages of implementation, the Project encountered significant difficulties in counterpart contributions. This meant no field allowances for local staff, so they were reluctant to accompany consultants to the field or to travel on project-related matters. The situation improved after the midterm review when PGH more clearly appreciated the need for counterpart funding.

29. PGH's lack of familiarity with ADB procedures for operating imprest accounts, progress reporting, and general financial management was also problematic. The limited capacity in English language made for difficult communications between technical specialists and during the review missions. The situation with language difficulties improved noticeably in 2002 when ADB's resident mission staff became more involved. Provincial appreciation of the designed components was limited. Only after a major stakeholder familiarization workshop in 2002 did provincial and district staff understand how they could participate and what was expected of them. In all aspects, PGH performance improved throughout implementation and was considered satisfactory by project completion. Some of the earlier difficulties managing consultants could have been more efficiently addressed if PGH had greater experience in internationally funded development projects.

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

30. The main concern about ADB's performance came from the frequent change of project officers and the impact this had on granting approvals for project activities. Review missions were not always undertaken in a timely manner, nor did they coincide with the seasonal conditions that would allow a more comprehensive review process. No ADB review missions

were fielded during three periods of 12 or more months. Communications between ADB, the PIO, and implementation consultants were cumbersome initially as new officers imparted different understanding in approving work plans. The situation improved after the Midterm Review Mission in December 2002 and continued to improve dramatically after October 2005, when project administration was handed over to the resident mission where the difficulties created through language were less a problem. Overall, however, ADB's performance is considered to be only partially satisfactory in spite of the recent improvement from the change in project administration after October 2005.

### **III. EVALUATION OF PERFORMANCE**

#### **A. Relevance**

31. The Project is rated as "relevant." Given its focus on livelihood improvement for poverty reduction through a broad range of interventions, ranging from rural access roads to village water supplies, sanitation, and village saving and credit scheme, the Project was highly relevant to the current policies of the Government and ADB. Furthermore, the capacity building initiatives empowered customary landowners to manage their resources in a more sustained manner, while the introduction of pilot technologies to support the sedentarization of farming systems proved highly relevant. Project interventions resulted in a significant improvement of overall livelihoods and demonstrated that shifting cultivation practices could be replaced with sedentary farming activities, including irrigated paddy production where feasible. More significantly, it provided the means to diversify income-earning activities away from the extraction of natural resources (non-timber forest products) and shifting cultivation; and to adopt market-oriented activities, some agriculture-based but others responding to opportunities made possible through improved access. This is consistent with previous ADB studies that suggest that investments to reduce poverty do not always need to be in traditional livelihood activities but should consider wider opportunities outside the immediate geographic area.

32. The relevant rating is confirmed by the reduced poverty within the target area, reduced number of opium addicts, sustained harvesting of nontimber forest products to generate household incomes, and changes in attitudes of government personnel in respect of land allocation and natural resource management. Of institutional relevance was the change of approach to land allocation procedures in that (i) land allocation has become an ongoing activity rather than a one-time event in a village; (ii) land types allocated are now restricted to permanent agricultural areas (improved areas) rather than rotational fallow land; (iii) land claim procedures are handled in a more consultative and timely manner; (iv) land use contracts (for cash cropping) are no longer issued as an incentive to bring about changing cropping patterns; (v) agricultural land mapping uses global positioning system coordinates for boundary delineation rather than tape and compass field measurement; (vi) temporary land use certificates (TLUCs) can be renewed after 3 years; (vii) land tax exemptions are applied at different rates for different crops rather than on a plot by plot basis; (viii) both husband and wife are registered owners of the TLUC, whereas previously only the husband was registered; and (ix) a TLUC registry is maintained in the village with each certificate having a unique identification number, whereas previously loss of records of land ownership was common. The pilot was therefore considered relevant to the immediate problems faced by upland shifting cultivators in Xam Neua District.

#### **B. Effectiveness in Achieving Outcome**

33. The Project is rated as "effective." In discussing the effectiveness in achieving outcomes, an assessment must not only be made of the performance against stated outcomes, but also of

the manner in which this pilot project has influenced higher level policy making in modifying approaches to increasing sedentarization. The five main desired outcomes were to (i) develop capacity of agency staff in the area of land use planning and allocation, and technical aspects of diversified agricultural and forestry production; (ii) promote diversified sedentary farming systems; (iii) initiate village-based development of irrigation, water supplies, village tracks, and village saving and credit schemes; (iv) establish rural infrastructure — roads and markets; and (v) improve project management skills for externally funded projects.

34. Given the early difficulties with appointing counterpart staff to work alongside consultants, opportunities were missed in the early stages for transferring technical skills and approaches associated with sedentary agriculture. Achievement of the intended outcome in this area improved markedly after the midterm review when additional counterparts were appointed. Capacity building initiatives were also constrained by their technical understanding and interpretive skills in detecting subtle changes in farming systems and recognizing benefits that might accrue from introduced technologies. Capacity building among the village communities was more effective as evident by the preparation of village development plans and land use zoning initiatives. Local communities have clearly demonstrated they can assume greater responsibility in the management of natural resources, even though in a few instances, provincial decisions to allow timber extraction were issued for village land. They have assimilated the process of land use planning and understand the benefit from sustainable management of the natural resources under their control.

35. The promotion of sedentary agricultural farming systems was an effective means of reducing dependence on shifting cultivation for immediate food requirements. The technologies promoted, which included increasing irrigated production, diversifying crops into upland annual crops and perennials, and substituting livestock production for shifting cultivation, all proved appropriate as income and food producing alternatives through on-farm trials and demonstrations. These changes of farming systems were only made possible through the provision of technical production information, market access, and credit. The package of support is considered essential in generating project outcomes. With this support, income from diversified crops increased on average by KN0.4 million/household, income from livestock increased by over KN1 million/household. The single largest impact was the dramatic increase in nonagriculture production: average per household sales of handicrafts and woven goods increased by KN1.8 million from project start to completion.

36. The main contributing factor to increasing household incomes and food security was probably the village-based identification and development of small-scale irrigation.<sup>7</sup> This provided the added security to allow farmers to undertake other productive activities in the knowledge that their basic food requirements (for rice) were assured. The added security provided through the provision of irrigation water had a very positive influence upon farmer attitudes to risk and the adoption of alternate production technologies. Similarly, the added cash incomes from weaving and livestock production made possible by the provision of credit and gaining access to external markets along the rehabilitated road alignment<sup>8</sup> and village tracks were effective interventions. The initial disbursement for village credit was KN1.6 billion, which increased through interest charges and additional savings to KN2.3 billion by project completion through the 56 credit groups, most of which was applied for weaving and livestock purposes. In addition to income-producing impacts, the water supply and sanitation interventions effectively

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<sup>7</sup> Thirty-one schemes covering 209 ha were constructed (average size of about 7 ha).

<sup>8</sup> Transport costs decreased by KN3,000 per person per journey from Ban Ven to Ban Don, while freight rates decreased by KN1,000 per 50 kilogram bag of goods along the same route.

reduced the incidence of disease, thus improving labor productivity. Women in particular benefited from the reduced time spent collecting water. The time saved from the drudgery of water collection was applied to commercial opportunities, mainly weaving, that significantly boosted household incomes. The improved sanitation (latrines) also impacted the incidence of water-borne disease with the number of cases of malaria decreasing from 15 to 9 per 1,000 and infant mortality under 1 year decreased from 34 to 26 per 1,000 (also a reflection of improved access to health services along the rehabilitated roads).

37. As indicated, a necessary prerequisite for the package of project initiatives was the rehabilitation/establishment of the two access roads that passed from NR6 into the project areas. Without access to the more remote upland villages from the national highway, impacts from interventions would have been significantly less. Trade increased; particularly for weaving products and livestock, where the majority of the larger animals were traded outside the region (a significant number of cattle and buffalo were exported to Viet Nam across the very porous international boundary). The rehabilitated roads also reduced transport costs, freight rates, vehicle operating costs, and travel times making better equipped and better qualified health and education services more accessible to the local population. Children traveled easily along the rehabilitated alignments to schools in neighboring villages, travel that previously was not possible. Rehabilitation of the access roads and village tracks is therefore considered a necessary and very effective means of achieving the project outcomes. Efforts to improve management were effective for PIO staff. While initial difficulties were experienced due to limited familiarity with management principles, by project completion a resident capacity for internationally funded project implementation had been achieved.

38. Finally, the Project was considered effective in introducing new approaches to land allocation, land use planning, and long-term user rights. Furthermore, the Government has a greater appreciation of the need to involve communities in the management of natural resources where the Government clearly does not have the resources to maintain a local presence and administer and police land use zoning. New technologies have been demonstrated and the results are sufficiently encouraging as long as access to markets can be achieved, along with access to technical extension services and credit that will allow farmers to participate in the new technologies.

### **C. Efficiency in Achieving Outcome and Outputs**

39. The Project is rated as “less efficient.” In assessing the efficiency in achieving outcomes and outputs, the isolation and topographic conditions found in the project area must be acknowledged. Even though Xam Neua is the central district of the province and NR6 passes through the area, at project commencement the area was considered isolated. Furthermore, the rugged topography makes for challenging road and intervillage track design. The intent of the Project was to stabilize farming systems and improve livelihoods that could only be achieved by providing access to these remote villages. The cost of access in such environs is high. But access is a necessary prerequisite to other interventions that followed under the Project. To assess the efficiency of the investment in terms of unit cost per beneficiary is therefore misleading, as the single largest budget item was for rural roads.<sup>9</sup> Construction of the road might better be considered as a sunk cost to provide access to both commercial and social

<sup>9</sup> The two access roads cost about \$1.378 million for the 55.8 km or about \$24,700 per km. Given that one road comprised a new alignment and the other rehabilitation of an existing alignment, the average unit cost is still high. Efficiency of road investment in sparsely populated areas (4.6 persons/ha) is low. The average cost of road per beneficiary is estimated at about \$90 per person.

benefits throughout the area. In this way, the efficiency of the investment achieving the stated outcomes is significantly higher.

40. Institutional capacity building in land use planning was efficiently executed with new procedures developed under the Project and adopted by the province. The land survey teams proved to be a relatively low-cost means of undertaking the field survey work to confirm boundaries and prepare for TLUCs. The mechanism for registering new certificates is a significant improvement on the previous recording system. Capacity building for agriculture and forestry technical and extension staff was also handled efficiently, although the impact of such training was less obvious. Village-based development initiatives were efficiently handled with the UNODC-appointed consultant bringing good experience in community mobilization and participatory planning. While more time was required than anticipated to establish and train the VDCs, the process proved relatively efficient and could not have been expected to be any faster. Expectations of VDC establishment in the original design were considered ambitious. The irrigation, water supply, latrines, rural tracks, and village savings and credit schemes were identified through participatory processes in the villages and were implemented efficiently given the additional transport cost for delivering goods to these locations.

41. One area where the efficiency of achieving the outcome could be challenged was the access road. The original detailed engineering design submitted for consideration proposed a more significant (higher cost) access road (also with greater negative environmental impact). After downsizing the design, ADB approval was granted; but, even so, the cost was about \$24,700/km. Accepting the arguments in para. 40, this still represents a relatively inefficient investment. One must question if the access roads could be better located to serve village clusters linked by cheaper tracks thereby lowering the capital cost per beneficiary. The revised analysis of the economic internal rate of return (EIRR) shows it is dominated by the high cost of the roads and consulting services. The other area where inefficiencies are evident is consulting services. While much of the technical inputs were delivered through the consulting services contracts, the higher unit cost for international expertise compared with regional consultants (such as from Myanmar or Thailand with fewer language barriers) made for inefficiencies. This was confounded by untimely international inputs that were provided before gaining access to the target population for introducing sedentary production technologies. The land allocation specialist input was timely as it was a necessary first step in the process, while the farming systems specialists would have been more efficient if they delivered inputs after completion of the access road. Thus, the overall efficiency in achieving the outcomes must be assessed as less efficient.

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

42. The sustainability of the Project is rated as “likely.” Recognizing the importance of O&M to sustain benefits from infrastructure establishment and rehabilitation, the Project developed a system for beneficiary contributions to O&M costs for access roads, village tracks, and water supply and irrigation facilities. To sustain the delivery of technical support, it trained village volunteers in livestock development, agriculture, and the functioning of user groups for irrigation facilities and water supply systems. It also focused on developing the capacity of the savings and credit group managers as well as the VDCs to develop plans for priority investments. These initiatives were undertaken in recognition of the limited capacity within the district administration to assume similar support roles and because of the limited resources available for maintenance of the province’s infrastructure.

43. Responsibility for road maintenance of the two access roads and village tracks was organized based on a joint contribution from beneficiaries along the road through village regulations amounting to \$100/km, while PGH has accepted responsibility for the larger maintenance activities such as landslides during the rainy season estimated at \$400/km. The purchase of two backhoes proved invaluable in keeping roads open as unstable slopes through the mountainous terrain frequently collapsed. Considerable maintenance was undertaken under force account—essential to maintain access to the 52 villages during implementation. Inspection of the roads revealed a need for routine maintenance along most of the length of the roads, in particular of steeper inclines where runoff has eroded surfaces. If these are not repaired with some urgency, longer term benefits will be threatened. Logging trucks with overloaded axle weights (exceeding the design standards of the two access roads) caused significant damage. PGH was instrumental in insisting the logging company repair the road when extraction was complete. However, this raises the issue of appropriate design for specific purposes and that nonconforming use should not be allowed.

44. For other items of infrastructure, the linkage with the beneficiary is more direct, i.e., for markets, water supply and sanitation, and irrigation; the Project has developed the capacities of beneficiaries to understand the need for O&M. For water supply and irrigation, the prospect of sustainable benefits is considered likely. In the case of the markets, sustainability is very much a function of utilization. Two of the three market structures established are being used regularly and market administrators are able to collect fees from stall operators, both casual and permanent. Under these circumstances, funds are expected to be available to maintain the structures. For the less utilized market, the province may have to subsidize funds for its O&M until utilization increases. The fact that one market is currently underutilized reinforces the notion that markets should be left to “grow” before investing substantially in infrastructure in that location. Also an upgraded alignment changes traffic dynamics; what was previously considered a desirable location for a market may not be after the road is rehabilitated as it allows access to other more significant districts or provincial markets.

45. While maintenance of infrastructure is possibly the most important consideration in sustaining benefits, one must also consider other elements of the Project responsible for achieving its impact. Technical support played an important role in the change to more sedentary farming systems under the guidance of the consultants. Capacity building of local technical and extension staff was attempted but was not as effective as it might have been. Given this situation and the limited resources available for district extension officers and provincially based technical subject matter specialists to support remote communities, the Project’s solution of training village specialists in a wide range of technical areas was laudable. Whether they have the knowledge to sustain technical support in the future is questionable without ongoing support from the district and provincial extension services. The achievements in stabilizing production systems are likely to be sustained but further innovations are unlikely to continue at the rate observed during implementation. The operations of village saving and credit schemes appear to be well understood; they are operating satisfactorily with substantial increases in capital resources. As these are administered by villagers, their operations should be sustained and benefits from this initiative therefore likely to continue.

## **E. Impact**

46. Regardless of the high average cost per beneficiary that resulted from two significant access roads and technical assistance, this pilot project developed approaches for upland villagers in recognized opium-growing areas to stabilize their cropping activities and diversify sources of livelihoods while maintaining the integrity of the natural resources in the areas where

they reside. It achieved its stated objectives, reducing the number of poor households from 1,241 before the Project to 522 at completion. Not only did the Project achieve a positive result in terms of distribution of benefits, but the average per capita income increased from KN0.89 million to KN2.13 million. Incremental gains were generated from agricultural activities, e.g., diversification of incomes made possible by the access road, and technical support and credit facilities provided under the Project, while off-farm opportunities were the major contributor to improved livelihoods. In addition, the less quantifiable benefits from the improved village water supplies, pit latrines, network of rural tracks, and improved access to health and education services has resulted in improved socioeconomic conditions of these upland inhabitants. The outcome provides the Government with a workable alternative for facilitating the transition from shifting cultivation to stabilized production systems without forcing beneficiaries further into poverty. However, the cost of such transition is high. By adopting the longer term perspective, the investment may well prove small in relation to the benefit from sustained natural resource use. At appraisal, the estimated EIRR was 13% with the main benefits being derived from incremental crop production, while water supplies showed an EIRR of 20%. Analysis of the actual benefit achieved (Appendix 11), which estimates an EIRR of 13.8%, reflects the incremental crop yields and the time that was made available for off-farm activities through the village water supplies and the reduced labor involved in water collection.

#### **IV. OVERALL ASSESSMENT AND RECOMMENDATIONS**

##### **A. Overall Assessment**

47. The overall assessment of the Project (Appendix 12) is “successful.” The multifaceted approach to diversifying incomes away from shifting cultivation and opium production proved successful. The important role assumed by local communities in managing natural resources was demonstrated in situations where appropriate authority was assigned to the village committees (after capacity building), and provincial institutions can support their development plans. One must be realistic as to the cost of such an approach as the difficult topography and low population densities result in high cost interventions per beneficiary. The cost of access roads under these conditions suggests that greater efficiency of investment might be achieved by developing focal access roads with feeder tracks targeting village clusters. Furthermore, the phased input of technical assistance that supports established institutional implementation mechanisms should be coordinated with a realistic implementation schedule.

##### **B. Lessons**

48. Lessons include the following:

- (i) Implementation schedules must be realistic and recognize the capacity of local agency staff. Where a new approach is proposed, institutional rigidity (the ability to adopt change), which is common with top-down management systems, means considerably more time is needed to effect change.
- (ii) Project designs should be flexible to allow changes as more appropriate methods for undertaking the same project interventions are recognized, e.g., the approach used to establish irrigation and water supply systems was changed from the original design to adopt approaches used by UNODC where labor is viewed as a beneficiary contribution rather than being paid for by loan funds.
- (iii) Project start-up workshops are needed to improve the efficiency of PIO staff in areas of financial and progress reporting, procurement, reimbursement of imprest accounts, and other implementation management matters.

- (iv) The timely recruitment of consultants to support implementation can improve overall efficiency. Where two financiers are involved, recruitment for the two packages should be closely coordinated. Considerable effort can be saved by harmonizing reporting requirements to donors/financiers.
- (v) The appointment of counterpart staff to assist with project implementation should be made immediately upon loan effectiveness and their responsibilities under the project clarified to ensure their full commitment to project activities.
- (vi) Regular reviews should be undertaken in a timely manner so that remedial action can be taken should the need arise.
- (vii) Project designs in the Lao PDR should seek early commitment for essential project activities, such as the participation of counterparts during implementation. Provincial budgetary resources are still dependent upon national government allocations and are both scarce and in great demand by line agencies. Counterpart allocations are more readily made where local administrations appreciate the requirement for counterpart funds in advance.
- (viii) To gain better access to the technical support services of national institutions, closer links need to be incorporated into the project management structure.
- (ix) Access is a necessary prerequisite to other livelihood initiatives.
- (x) Where English language skills are limited among PIO and executing agency staff, administering a project from the country resident mission as early as possible after inception can provide efficiencies.

### C. Recommendations

49. The recommendations (Table 1) are based on the performance evaluation and lessons identified from implementation of the Project.

**Table 1: Project-Related and General Recommendations**

Suggested Action	Institution Responsible	Suggested Timing	Monitoring Responsible
<b>A. Project Related Recommendations</b>			
<b>Land Allocation Policy.</b> In view of the impact from designed interventions, the Government should review the approaches adopted for land allocation and utilization management with the view to modifying existing policies for allocating land used in shifting cultivation regimes.	National Land Management Authority	Second half of 2007	LRM
<b>O&amp;M of Public Infrastructure.</b> The Government should rationalize the allocation of scarce budgets, prioritizing the maintenance of its capital stock rather than extending it. The return on maintenance is significantly higher than for high unit cost infrastructure with low utilization.	PGH and its Department of Transport	Second half of 2007	LRM
<b>Rural Access Road.</b> Future access roads to promote increased livelihood options and poverty reduction should explore more cost-effective ways to achieve a similar impact but at a lower unit cost (different mix of design standards).	Design teams	Immediate	LRM
<b>Sustainability Plan.</b> PGH should provide the necessary funding so this plan, prepared under the Project, can be fully implemented.	PGH	Immediate	LRM
<b>B. General Recommendations</b>			
When preparing projects, counterpart contributions should be realistically assessed and set at levels that will avoid or minimize implementation constraints.	Design teams	Immediate	LRM and PGH

Project design teams should be realistic in scheduling project activities, particularly for participatory processes with ethnic communities and relatively unfamiliar agency staff.	Design teams and private consultants	Immediate	LRM and provinces
Wherever possible, national ministries and institutions should be involved in the steering committees of development projects being implemented by provincial administrations.	Design teams and private consultants	Immediate	National agencies, financiers, donors
Capacity building of provincial and district staff will continue to be a major challenge for implementers of similar development initiatives and should be financed, where possible, by grants.	Design teams and private consultants	Immediate	Aid coordination meetings

LRM= Lao Resident Mission, O&M= operation and maintenance, PGH= provincial Government of Houaphanh

50. **Timing of the Project Performance Evaluation Report.** In view of the time needed for the adoption of alternate income-generating options from agriculture, the project performance evaluation report should be undertaken 4 years following project completion.

## SOCIOECONOMIC INDICATORS OF TARGET PROVINCES

Item	Before Project (1999)	2006 Equivalent
<b>A Population</b>		
1. No. of people (% females)	14,717	15,146
2. No. of households	2,160	2,259
3. No. of villages	52	52
4. Government poverty indicator (KN/person/month)	15,000	
5. Poverty distribution		
Better off (No. of households)	216 (10%)	370 (16%)
Average (No. of households)	703 (33%)	1,367 (61%)
Poor (No. of households)	1,241 (57%)	522 (23%)
<b>B. Rice Sufficiency</b>		
1. Less than 2 months shortage (No. of households)	216	366
2. Two to 6 months shortage (No. of households)	703	1,332
3. Greater than 6 months shortage (No. of households)	1,241	561
4. Average months of rice shortage (No. of households)	7.3	—
<b>C. Livelihood Indicators</b>		
<b>Agriculture</b>		
1. Paddy area (ha)	703	1,003
2. Upland cultivated area (ha)	1,200	736
3. Area of nonrice crops (ha)	0	0
4. Households with paddy land	1,004	1,068
5. Households with upland cultivation	1,156	910
6. Households with nonrice crops	—	648
7. Irrigated paddy area (ha)	54	319
8. Households with irrigated paddy	77	400
9. Households using improved rice varieties	—	13
<b>Livestock</b>		
1. Households with livestock	1,890	2,203
2. Livestock numbers		
a. Cattle	3,976	7,970
b. Buffalo	—	—
c. Pigs	4,056	6,823
d. Goats	297	1,725
e. Poultry	20,498	38,511
3. Area of fishponds (ha)	18	61
<b>Household Income</b>		
1. Per capita income (KN/person/yr ['000])	889	2,131
2. a. From upland farming (KN/person/yr ['000])	1,246	1,600
b. From nontimber forest product (KN/person/yr ['000])	356	151
c. From weaving and handicrafts (KN/person/yr ['000])	546	2,707
d. From off-farm labor (KN/person/yr ['000])	2,735	988
<b>D. Opium Cultivation</b>		
1. Households growing opium	1,600	0

Item	Before Project (1999)	2006 Equivalent
2. Area planted to opium poppy (ha)	724	0
3. No. of addicts		
Males	250	24
Females	70	13
4. Addicts rehabilitated		
Inside project area	—	247
Outside project area	—	561
5. Farm-gate price of opium (KN'000/kilogram)	6,500	7,800
<b>E. Shifting Cultivation</b>		
1. Area of shifting cultivation (ha)	1,200	507
2. No. of households involved	1,156	906
3. Average fallow period (years)	5	5
<b>F. Land Use Planning and Allocation</b>		
1. Households with land use certificates	224	495
2. Villages with land use plans	23	52
3. Village land use maps registered	23	52
4. Land area with certificates (ha)	37	221
5. VDCs formed	23	52
6. Villages with regulations on conservation	23	52
<b>G. Village Infrastructure</b>		
1. Villages with road access	20	49
2. Households with access to clean water	600	2,259
3. Villages with water supplies	16	52
4. Households with pit latrines	—	44
<b>H. Health and Sanitation</b>		
1. Villages with health facilities	38	52
2. Villages with health volunteers	13	52
3. No. of trained midwives	28	58
4. No. of trained health volunteers	26	96
<b>I. Access to Credit</b>		
1. Credit disbursed to groups (KN million)	—	1,632
2. Value of savings in credit groups (KN million)	11.1	366
3. Accumulated assets of credit groups (KN million)	29.9	2,259
4. No. of credit groups	10	56
5. Households accessing credit	423	2,671
6. Credit applied to		
Weaving (%)	60	21
Livestock (%)	5	55
Agriculture (%)	2	3
Nontimber forest products (%)	1	0
Others (%)	32	21

ha = hectare, KN= Lao currency unit (Kip), VDC= village development committee, yr= year, — not available.

Sources: Project benefit monitoring and evaluation Report and ADB Project Completion Report Mission, February 2007.

## PROJECT FRAMEWORK

Design Summary	Targets	Project Monitoring Mechanisms	Risks/Assumptions
<p><b>Sector/Area Goals</b></p> <p>1.1 Reduce poverty in the project area</p> <p>1.2 Increase food production</p> <p>1.3 Reduce the production and consumption of opium</p> <p>1.4 Protect natural resources from soil erosion, forest fires, and deforestation</p>	<p>The number of poor people reduced by about 40% by 2009</p> <p>Food deficiency resolved by 2005</p> <p>Opium production and consumption reduced to negligible levels by 2005</p> <p>Soil erosion, forest fires, and forest product extraction reduced significantly as shifting cultivators adopt more diversified, market-oriented, sedentary farming systems</p>	<p>- Benefit monitoring and evaluation (BME) reports and participatory rural appraisals</p> <p>- Ministry of Agriculture and Forestry and ministry statistics</p> <p>- Project completion report</p> <p>- Department of Forestry statistics</p>	<p>- A major change in the vision and knowledge of local people to adopt market-oriented, diversified, sedentary farming systems will be based on land ownership, sound land use planning, good market opportunities, improved infrastructure, improved social conditions, and adequate credit backstopped by effective government support services</p>
<p><b>Purpose (Immediate Objectives)</b></p> <p>2.1 Improve incomes of project beneficiaries through the adoption of market-oriented, diversified, sedentary farming systems</p> <p>2.2 Conserve natural resources</p>	<p>Household incomes increased by 50% by 2009</p> <p>Area under shifting cultivation reduced by about 600 ha by 2005 as farmers adopt more efficient productive and profitable sedentary farming systems</p> <p>Land use certificates issued by 2004 Soil erosion, forest fires, and removal of forest products reduced</p>	<p>- Project progress reports - BME surveys - Farmer surveys - Market surveys - Village and household surveys</p> <p>- Project progress reports Project review missions BME surveys</p>	<p>- Farmers adopt new technologies to replace traditional shifting cultivation systems</p> <p>- Adequate land is allocated to develop sedentary systems</p> <p>- The allocation of land to villagers to develop sedentary farming systems is equitable and sufficient</p> <p>- Villagers, including the poor, have equitable access to project benefits</p>

Design Summary	Targets	Project Monitoring Mechanisms	Risks/Assumptions
			- Residents are interested in participating in project initiatives including natural resource management
<p><b>Outputs</b></p> <p>3.1 Institutional strengthening and capacity building</p> <p>a. Capacity strengthening for land use planning and allocation</p> <p>b. Strengthening of provincial agriculture and forestry services</p> <p>3.2 Diversified farming systems</p> <p>a. Technical assistance</p> <p>b. On-farm trials and demonstrations</p> <p>3.3 Village-based development</p> <p>a. Village and community capacity building</p>	<p>Integrated management of land and natural resources office established by Dec 2000</p> <p>Ten additional land allocation teams operating by 2000</p> <p>Equipment installed in upgraded training facilities by 2000</p> <p>Subject matter specialists from PAFO and extension staff from DAFEO trained by 2001</p> <p>Extension training material prepared in local languages by 2001</p> <p>Veterinary diagnostic laboratory constructed by 2001</p> <p>Consultants fielded by October 1999</p> <p>On-farm trials and demonstrations established in 48 villages promoting economically and financially viable agriculture (192 ha), small livestock (24 demos), aquaculture (2 demos), pasture (20 demos), and forestry systems (16 schemes) by 2005</p> <p>Two LDCs established by 2000</p> <p>VDCs established in each village by Dec 1999 and development plans prepared by Dec 2000</p>	<p>- Project progress reports Review missions</p> <p>- Project progress reports Review missions Internal evaluation and analysis of staff training programs, field activities, and support services</p> <p>- Project progress reports Review missions</p> <p>- Project progress reports Review missions Community surveys</p> <p>- Project progress reports Review missions Community surveys</p>	<p>-The Government supports the amalgamation of NOFIP, CPAWN, and SSLCC into an office for integrated management of land and natural resources with adequate resources</p> <p>-The Government supports the allocation of all village land to households and village communities following the project procedures</p> <p>-The Government supports training programs and trainees are capable of understanding new technologies</p> <p>- The consultants are competent</p> <p>- SUNV provides adequate support for village capacity building</p>

Design Summary	Targets	Project Monitoring Mechanisms	Risks/Assumptions
	Selected villagers trained in village development planning, land use planning, agricultural technologies, and livelihood development		
b. Irrigation development	Seven small-scale village irrigation schemes for an area of 160 ha rehabilitated by 2004	- Project progress reports Review missions	- WUAs are well established - No serious floods and drought occur in the project area
c. Water supply and sanitation	Clean drinking water facilities renovated or constructed in 30 villages by 2004	- Project progress reports Review missions	- WUAs carry out proper maintenance of irrigation and water supply systems
d. Rural tracks	1,400 latrines constructed in 30 villages by 2004 50 km of tracks constructed to access 37 villages by 2002	- Project progress reports Review missions	- Community commits to making labor available for maintenance
e. Village revolving funds for income generation	Revolving funds established in each village providing credit to 630 farmers for income generating activities by 2004	- Project progress reports Review missions	- Communities are able to maintain and utilize the revolving fund
3.4 Rural infrastructure development			
a. Rural access road	About 35 km and 20 km of rural access road rehabilitated in Nam Ven and Nam Ham by 2002	- Project progress reports Review missions	- The Government provides adequate budget for maintenance of rural access roads
b. Rural markets	Three rural markets constructed by 2002	- Project progress reports Review missions	- Appropriate management, use, and maintenance procedures for efficient operations
3.5 Project management			
a. Village development committees	VDCs established in all villages in project area by December 1999	- Project progress reports Review missions	- Sufficient flow of funds from the central Government to the provincial government to ensure efficient implementation of the Project.
b. Project implementation office	PIO established by March 1999	- Project progress reports Review missions	

BME = benefit monitoring and evaluation, DAFEO = district agriculture and forestry extension officer, LDC = local development center, PAFO = provincial agricultural and forestry office, PIO = project implementation office, SUNV = a joint program of the Government of the Netherlands and United Nations Volunteers, VDC = village development committee, WUA = water user associations.

## LIST OF SIGNIFICANT INFRASTRUCTURE

Description	Design Capacity	Cost Estimate (\$)			Actual Cost (\$)		
		Design <sup>a</sup>	Construction	Total	Design	Construction	Total
<b>A. Rural Roads</b>							
1. Ban Hamtai Sangkham	21 km	2,870	551,524	554,394	400	600,487	600,887
2. Ban Don Ban Pieng	34.8 km	4,000	796,483	800,483	450	778,051	778,501
<b>B. Village Tracks</b>							
1. Improvement–Nam Oun, Ban Yard	3.0 km	143	6,303				10,239
2. Improvement–Nam Oun, Ham Tai	3.4 km	153	7,974				4,429
3. Construction–Ban Houai Sone	3.1 km	175	9,921				9,957
4. Construction–Ban Houai Sard	6.1 km	410	13,404				11,941
5. Construction–Ban Houai Peik	4.3 km	207	18,084				19,391
6. Construction–Ban Bang	3.3 km	310	8,938				7,268
7. Improvement–Van-Khoun VDC, Ban Na Pai	7.1 km	472	14,928				15,872
8. Improvement–Pieng, Ban Khong	3.5 km	290	11,028				12,453
9. Construction–Xangkham, Ban Napieng	6.0 km	495	20,895				29,931
10. Construction–Ban Houai San	4.2 km	400	23,228				28,718
11. Construction–Ban Tabong	5.0 km	485	25,710				26,172
12. Construction–Ban Khong, Ban Na	3.2 km	351	28,965				19,585
13. Construction–Na, Ban Houai Tang	4.2 km	351	27,848				16,887
14. Construction–Ban Keo Kuang	4.0 km	300	14,184				9,033
15. Construction–Ban Houai Tang-Keo Euad	2.3 km	250	14,851				5,800
16. Construction–Ban Houai Han (Japan)	3.3 km	400	9,785				11,162
17. Construction–Ban Sombong (Japan)	2.1 km	250	6,954				9,404
18. Construction–Ban Teuam (Japan)	8.5 km	756	64,980				80,223
<b>Total</b>	<b>76.9 km</b>						

Description	Design Capacity	Cost Estimate (\$)			Actual Cost (\$)		
		Design <sup>a</sup>	Construction	Total	Design	Construction	Total
<b>C. Irrigation Establishment and Rehabilitation</b>							
1. Ban Saleui 1	12 ha	200	2,800	3,000	200	2,064	2,264
2. Ban Saleui 2	6 ha	200	1,800	2,000	150	1,613	1,763
3. Ban Saleui 3	8 ha	200	2,300	2,500	200	2,198	2,398
4. Ban Saleui 4	11 ha	300	3,700	4,000	300	3,416	3,716
5. Ban Na Meuang	5 ha	50	950	1,000	50	604	654
6. Ban Na Meuang	5 ha	50	950	1,000	50	604	654
7. Ban Na Jong	5 ha	200	2,800	3,000	200	2,648	2,848
8. Ban Na Houai	4 ha	100	2,700	2,800	100	2,151	2,251
9. Ban Phonexai 1	12 ha	400	5,600	6,000	300	4,813	5,113
10. Ban Phonexai 1	7 ha	100	1,400	1,500	60	1,006	1,066
11. Ban Na Kham	15 ha	400	11,600	12,000	400	11,139	11,539
<b>D. Market Structures</b>							
1. Ban Ham Tai	210 m <sup>2</sup>						17,570
2. Ban Meuang Ven	179 m <sup>2</sup>						16,350
3. Ban Saleui	210 m <sup>2</sup>						16,461
<b>E. Schools</b>							
1. Ban Pou Peid	2 rooms						3,769
2. Ban Nakham	2 rooms						437
3. Ban Sang Kham	5 rooms						1,673
4. Ban Keo Kuang	2 rooms						4,294
5. Ban Hadkok	2 rooms						3,510
6. Ban Don	2 rooms						640
7. Ban Bang	2 rooms						564
8. Ban Meuang Ven	2 rooms						667
9. Ban Na Loui	2 rooms						3,505
10. Ban Khong	5 rooms						1,706

Description	Design Capacity	Cost Estimate (\$)			Actual Cost (\$)		
		Design <sup>a</sup>	Construction	Total	Design	Construction	Total
11. Ban Houai Tang	5 rooms						20,274
12. Ban Houai Sam	2 rooms						5,025
13. Ban Tabong	5 rooms						20,807
14. Ban Houai Na	2 rooms						5,769
15. Ban Houai Yab	2 rooms						1,007
<b>F. Other Buildings</b>							
1. VDC Office–Ham	180 m <sup>2</sup>						15,760
2. VDC Warehouse–Ham	96 m <sup>2</sup>						13,057
3. VDC Office–Ven	180 m <sup>2</sup>						17,502
4. VDC Warehouse–Ven	96 m <sup>2</sup>						16,691
5. PIO Office	250 m <sup>2</sup>						53,323
6. Ham Bridge–Ban Nakham	20 m						54,049
7. Ham Bridge–Ban Nakham	20 m						56,070
8. Ven Bridge	30 m						85,893
9. Cable Bridge: Nam Xam–Ban Na Tang	86 m						26,016

PIO = project implementation office, VDC = village development committee.

<sup>a</sup> Design costs include the feasibility and detailed engineering designs.

Source: ADB Project Completion Report Mission, February 2007.

### TRAINING SUMMARY

Training Subject	Trainees	Nos. (fem./total)	Duration (days)	No. of Courses	Location
<b>A. Community Facilitation and Training</b>					
1. Community development	Village leaders	398/1,342	168	28	Various
2. Drug detoxification	Identified addicts	123/611	72	15	Various
3. Gender awareness	Village representatives	185/316	34	5	LDCs
4. Health services	Village health-workers	277/859	81	15	Various
5. Rural infrastructure	District staff and villagers	8/326	35	8	LDCs
6. Water supply and sanitation	District staff and villagers	19/200	16	4	LDCs
<b>B. Agricultural Training</b>					
1. Agroforestry	Villagers	359/1,406	189	21	Various
2. Crop improvement	Villagers	524/2,727	308	55	Various
3. Environmental impact management	District and village heads	1/6	60	1	Vientiane
4. Fodder crop development	Villagers	34/118	8	3	LDCs
5. Land use planning and land allocation	Village leaders	17/231	61	7	LDCs
6. Livestock and fisheries	Villagers	38/802	120	25	Various
<b>C. Project Administration Training</b>					
1. Project administration	Project staff	17/56	38 days	11	Houaphanh
2. Monitoring and evaluation	Project, district, villagers	22/181	17	2	LDCs
<b>D. Income Diversification Training</b>					
1. Income generation	Villagers	160/422	135	20	Various
2. Marketing	Villagers	34/125	8	4	LDCs
3. Village savings and credit	Village credit committees	330/1,134	233	29	Villages
<b>Total</b>		<b>2,555/10,862</b>	<b>1,583</b>	<b>253</b>	

LDCs = local development centers.

Sources: Executing Agency's project completion report and ADB Project Completion Report Mission, February 2007.

**PROJECT COST SUMMARY**  
(\$ million)

Cat.	Category Name	Initial Allocation	Latest Revision	Committed Funds	Amount Disbursed	Undisbursed Balance	Unutilized Balance	FE	Local	Total Cost
		<b>ADB Loan Funds</b>								
01	Civil Works									
01A	Buildings, Roads, and Markets	1,638.0	1,686.0	1,719.4	1,719.4	0.0	-33.4	586.2	1,367.7	1,953.9
01B	Village Tracks, Irrigation, Water Supply	163.0	0.0	0.0	0.0	0.0	0.0			
01C	Farm Labor	99.0	0.0	0.0	0.0	0.0	0.0			
02	Vehicles, Equipment, and Materials	672.0	549.4	550.1	550.1	0.0	-0.7	550.1	0.0	550.1
03	Consulting Service	1,676.0	2,360.6	2,259.4	2,258.4	1.0	101.2	1,752.6	505.8	2,258.4
04	Training and Study Tours	441.0	298.6	325.2	325.1	0.0	-26.6	42.8	282.4	325.2
05	Government Field/Travel Allowance	192.0	152.5	137.8	137.8	0.0	14.7	0.0	172.2	172.2
06	Vehicles and Equipment O&M/Rent	259.0	389.0	441.1	441.1	0.0	-52.1	162.2	278.9	441.1
07	Interest Charges	242.0	196.8	205.2	205.2	0.0	-8.4	205.2	0.0	205.2
08	Unallocated	218.0	10.0			0.0	10.0			
	<b>Total ADB</b>	<b>5,600.0</b>	<b>5,642.8</b>	<b>5,638.1</b>	<b>5,637.1</b>	<b>1.0</b>	<b>4.7</b>			<b>5,637.1</b>
<b>UNODC</b>										
	Credit		157.0		157.0		0.0	0.0	157.0	157.0
	International Consultant		1,103.4		1,103.4		0.0	1,103.4	0.0	1,103.4
	National Consultant		28.9		28.9		0.0	0.0	28.9	28.9
	Procurement		392.7		392.7		0.0	0.0	392.7	392.7
	Training and Study Tours		158.6		158.6		0.0	0.0	158.6	158.6
	Travel: UNODC staff etc.		52.7		52.7		0.0	0.0	52.7	52.7
	Implementation		58.3		58.3		0.0	0.0	58.3	58.3
	United Nations Service Fees		148.4		148.4		0.0	148.4	0.0	148.4
	<b>Total UNODC</b>	<b>1,317.0</b>	<b>2,100.0</b>		<b>2,100.0</b>		<b>0.0</b>	<b>1,251.8</b>	<b>848.2</b>	<b>2,100.0</b>
<b>Government</b>										
	Share of Civil Works	535.5			234.5					234.5
	Goods and Equipment (taxes and duty)	318.4			275.1				275.1	275.1
	Local Staff Salaries	1418.3			418.3				418.3	418.3
	Staff Travel Allowances	192.4			34.4				34.4	34.4
	Other Consumables	149.7			149.7				149.7	149.7
	Office Rental	67.7			67.7				67.7	67.7
	Land Contribution	127.9			127.9				127.9	127.9
	<b>Total Government</b>	<b>1,809.9</b>			<b>1,307.6</b>					<b>1,307.6</b>
	<b>Beneficiaries</b>	<b>108.5</b>			<b>108.5</b>				108.5	<b>108.5</b>
	<b>Total</b>	<b>8,835.4</b>						<b>4,550.8</b>	<b>4,602.4</b>	<b>9,153.2</b>

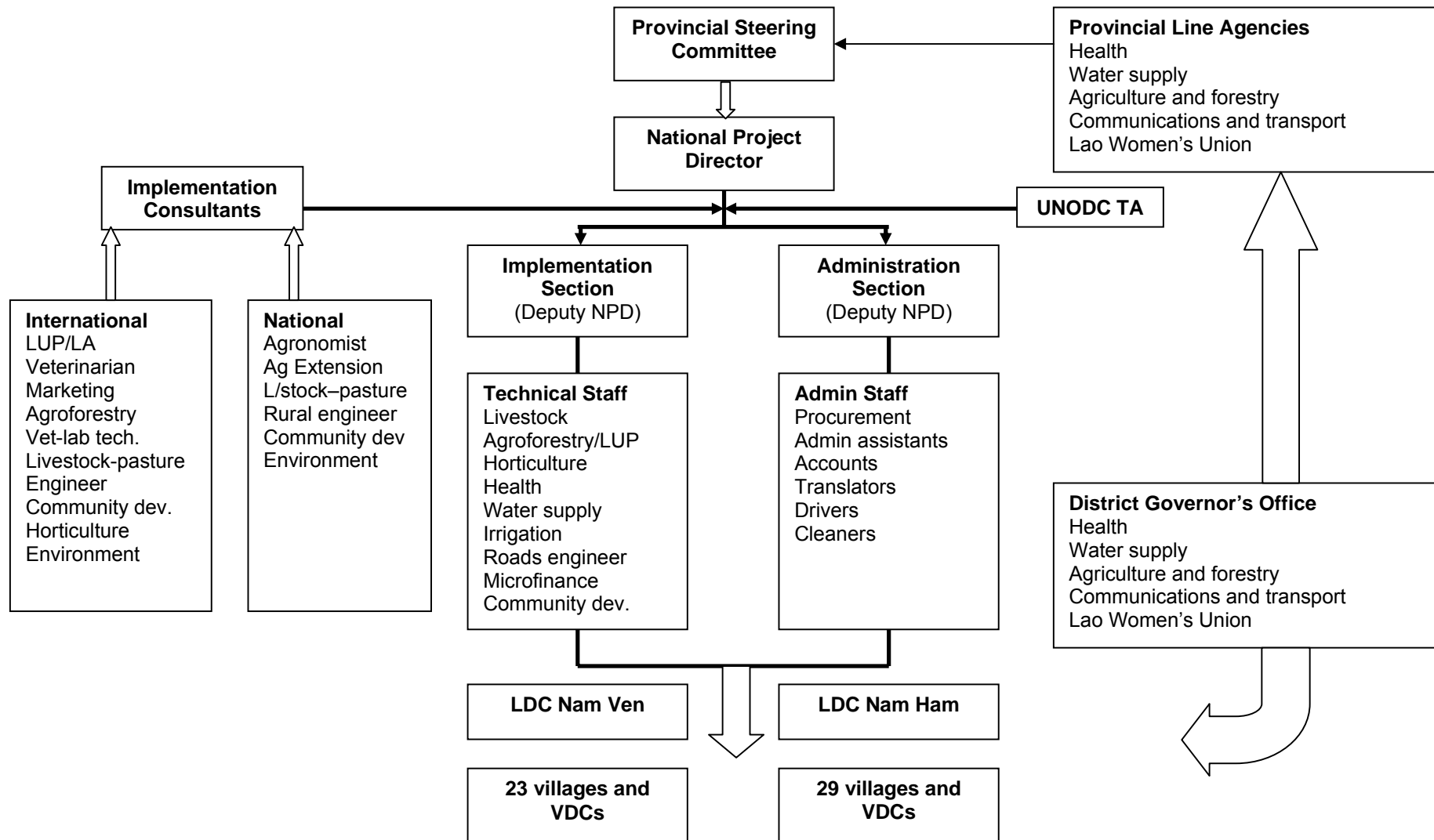
ADB = Asian Development Bank, FE = foreign exchange, UNODC = United Nations Office of Drug and Crime, UNV = United Nations Volunteers  
Sources: Executing Agency's project completion report and ADB Project Completion Report Mission, February 2007.

**PROJECT LOAN DISBURSEMENTS**  
(\$'000)

<b>Year</b>	<b>Quarter</b>	<b>Amount</b>	<b>Cumulative Total</b>
2000	I	200	200
	II	0	200
	III	401	601
	IV	197	798
2001	I	221	1,019
	II	234	1,253
	III	76	1,329
	IV	443	1,772
2002	I	85	1,857
	II	129	1,986
	III	258	2,244
	IV	89	2,333
2003	I	275	2,608
	II	427	3,035
	III	348	3,383
	IV	0	3,383
2004	I	549	3,932
	II	520	4,452
	III	261	4,713
	IV	192	4,905
2005	I	153	5,058
	II	96	5,154
	III	28	5,182
	IV	41	5,223
2006	I	197	5,420
	II	41	5,461
	III	70	5,531
	IV	106	5,637
<b>Total</b>			<b>5,637</b>

Sources: Loan Financial Information System and ADB Project Completion Report Mission, February 2007.

**PROJECT MANAGEMENT STRUCTURE**



LDC= local development center, LUP/LA= land use planning/land allocation, NPD= national project director, UNODC TA= United Nations Office of Drugs and Crime technical assistance, VDC= village development committee

### STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference in Loan Agreement	Status of Compliance
<b>Management and Implementation</b>		
The Borrower shall make available the necessary funds for operations and maintenance of project facilities.	Section 4.02	Complied with.
The Borrower shall furnish quarterly reports on the implementation progress of the Project.	Section 4.06 (a) and (b)	Complied with.
The Project Implementation Office (PIO) shall recruit an independent monitoring team to carry out Benefit Monitoring and Evaluation (BME) activities in coordination with the SUNV and the Village Development Committees (VDCs) in accordance with procedures and indicators agreed with the Bank. Socioeconomic monitoring surveys shall be carried out at the end of the second, fourth and sixth year of project implementation. The Borrower shall ensure that an initial benchmark survey shall be carried out by SUNV in collaboration with the PIO and VDCs in the first year of the Project.	Schedule 6, para. 17	Partially complied with. BME activities started in January, 2003 and the baseline data as such was not captured. Alternative sources for baseline data were obtained (Appendix 1).
The PIO shall set up a Management Information System in collaboration with CLCRD and consultation with other agencies of the Borrower, and shall use the system to monitor and evaluate project performance and impact.	Schedule 6, para. 18	Complied with.
The Borrower, in consultation with ADB and UNODC, shall carry out a comprehensive midterm review at the end of third year of project implementation to evaluate the actual physical and financial progress of the Project, project design, implementation arrangements, procurement, benefit monitoring and evaluation activities, management functions and the performance of consultants.	Schedule 6, para. 7	Complied with. The review was undertaken between 26 Nov and 6 Dec 2002.
The PGH shall ensure proper operation and maintenance (O&M) of the rural access roads upgraded or made under the Project. The Borrower shall cause the PGH to allocate necessary funds in its annual budget for maintenance of the rural access roads. The PGH shall ensure that project beneficiaries carry out routine maintenance of the rural tracks. The PGH shall ensure that VDCs in the project area, that shall be responsible for O&M of irrigation and water supply systems and markets constructed and provided under the Project, shall mobilize adequate resources for carrying out such operation and maintenance activities.	Schedule 6, para. 8	Partially complied with. Limited resources have restricted the allocation funds for O&M following project completion. Where local communities are responsible for maintenance, mobilization of resources has been satisfactory.

Covenants	Reference in Loan Agreement	Status of Compliance
<b>Environmental</b>		
The Borrower shall ensure that environmental mitigation and monitoring measures, particularly in respect of road construction and upgrading, will strictly follow recommendations in the IEE, the special environmental study, and any further recommendations to be made by the environment specialists during feasibility, detailed design, and implementation. The updated IEE and the bidding documents for the Nam Ven and Nam Ham roads will be submitted to ADB for approval prior to road upgrading and construction.	Schedule 6, para. 11	Complied with.
<b>Financial</b>		
The Borrower shall ensure that the activities of its departments and agencies ... and operation of the Project facilities are conducted ... in accordance with sound administrative policies and procedures	Section 4.04	Complied with.
The Borrower shall maintain financial accounts in accordance with appropriate accounting procedures. These accounts shall be audited annually by an independent auditor, the report from which will be submitted not less than 12 months after completion of the financial reporting period.	Section 4.06	Complied with.
The PIO shall maintain separate accounts of expenditure and disbursements under the Project. The Project Director shall prepare quarterly reports on the Project accounts and submit it to PGH. The PIO shall establish, as soon as possible after the Effective Date, in agreement with ADB, an accounting system capable of monitoring and reporting all disbursements made under the Project. Supporting documents shall be made available to the Bank's review mission and to the auditors.	Schedule 6, para. 6	Complied with.
Immediately after the Effective Date, the PIO shall establish a project account at a Bank in Xam Neua. The PGH shall replenish the Project account at least every three months or as required with an amount equal to the planned expenditure under the Project for the following three months.	Schedule 6, para. 6	Complied with. 15 Nov 1999
<b>Social</b>		
VDCs should be formed in each village through elections by 31 December 1999, and shall serve as the focal points for the village based development activities under the Project.	Schedule 6, para. 5	Complied with.
Village Development Plans shall be prepared through a participatory process.	Schedule 6, para. 5	Complied with.

Covenants	Reference in Loan Agreement	Status of Compliance
<b>Others</b>		
The Borrower shall undertake land allocation activities in the project area according to the procedures prepared by the National Shifting Cultivation Stabilization Program under MAF.	Schedule 6, para. 13	Complied with.
The National Office for Forest Inventory and Planning; the Center for Protected Areas and Watershed Management; and the Soil, Survey and Land Classification Center will be merged into an office for IMLNR by 31 December 2000.	Schedule 6, para. 12	Complied with.
The Borrower shall ensure that possessory rights and rights of use of the villagers to land allocated to them under the Project remain undisturbed for the duration of the Project, or until permanent land use certificates shall have been issued to the villagers, whichever is the earlier.	Schedule 6, para. 14	Complied with.

CLCRD = Central Leading Committee for Rural development, IEE = initial environmental examination, IMLNR = Integrated Management of Land and Natural Resources, MAF = Ministry of Agriculture and Forestry, SUNV = United Nations Volunteers, UNODC = United Nations Office of Drugs and Crimes.

**CONSULTING SERVICE INPUTS**

Consulting services were provided through Lao Consulting Group with an initial contract for \$2.25 million. The additional positions funded differed from those that appeared in the original design and were added during contract negotiations. The changes did not result in a change of scope but the reallocation of inputs was seen as a more appropriate means of supporting project activities.

**Table A9: Consultant Inputs**

<b>Position</b>	<b>Input at Appraisal</b> (person-months)	<b>Actual Input</b> (person-months)
<b>A. International Consultants</b>		
Team Leader/Agronomist	34	26.43
Deputy Team Leader	—	9.02
Land Use Planning and Land Allocation Specialist	6	7.84
Marketing Specialist	3	3.45
Agroforestry Specialist	6	4.99
Laboratory Specialist	3	3.15
Veterinarian	6	4.80
Livestock and Pasture Development	10	9.50
Environmental Specialist	4	4.59
Rural Engineer	—	1.00
Horticulturalist	—	3.08
Community Development Specialist	—	3.08
<b>Subtotal (A)</b>	<b>72</b>	<b>78.54</b>
<b>B. National Consultants</b>		
Agronomist	34	22.78
Agricultural Extension Specialist	34	29.91
Livestock Specialist	34	41.01
Environmental Specialist	13	13.72
Rural Engineer	—	4.33
Community Development Specialist	—	2.75
<b>Subtotal (B)</b>	<b>115</b>	<b>114.50</b>
<b>Total</b>	<b>187</b>	<b>193.04</b>

Sources: Executing Agency's project completion report and ADB Project Completion Report Mission, February 2007.  
— not available

## VEHICLES AND EQUIPMENT PROCURED

Item Description	Qty	Supplier	Date (Order)	Unit Price (\$/unit)	Total (\$)
<b>A. Office Equipment</b>					
1. Computer: CPU GATEWAY	10	Microtex Computer Co., Ltd	05/04/2000	2,650	26,500
Monitor GATEWAY	10	Microtex Computer Co., Ltd	05/04/2000		
Keyboard GATEWAY	10	Microtex Computer Co., Ltd	05/04/2000		
Printer HP LaserJet 1100	8	Microtex Computer Co., Ltd	05/04/2000	690.5	5,524
Printer Epson Color 1160	1	Microtex Computer Co., Ltd	05/04/2000	1,237	1,237
Printer Epson Color 760	1	Microtex Computer Co., Ltd	05/04/2000	883	883
Scanner 1200 U	1	Microtex Computer Co., Ltd	05/04/2000	352	352
Printer/Copier Office Jet R65	1	Microtex Computer Co., Ltd	05/04/2000	1,584	1,584
UPS 500	10	Microtex Computer Co., Ltd	05/04/2000	75	750
2. Photocopier Ricoh FT 4422	1	Microtex Computer Co., Ltd	05/04/2000	2,752	2,752
3. Overhead Projector	1	Vongjalern Service	05/04/2000	750	750
4. Radio Communications	3	PSM Electronic	30/04/2003	5,000	15,000
<b>B. Other Machinery and Equipment</b>					
1. LUP/LA Field Equipment:					
Handheld Gamin GPS 12	2	Diethelm & Co., Ltd	14/06/2001	313.5	627
Transfer Cable	2	Diethelm & Co., Ltd	14/06/2001	82.77	165.53
Compass (Silva land Mark)	10	Diethelm & Co., Ltd	14/06/2001	71.06	710.60
Clinometer height meter (SUUNTO)	5	Diethelm & Co., Ltd	14/06/2001	279.01	1,395.07
Planimeter "Koizumi" KP-90N	3	Diethelm & Co., Ltd	14/06/2001	877.80	2,633.40
Stereo Scope Pocket Type	2	Diethelm & Co., Ltd	14/06/2001	128.54	257.07
Pantograph C-THRU	1	Diethelm & Co., Ltd	14/06/2001	98.44	98.44
2. Office Furniture					
Office Desk BD 147	3	ViengNinhom Furniture	17/08/2000	179.03	537.08
Office Chair Lac 503 F407	3	ViengNinhom Furniture	17/08/2000	96.40	289.19
Sliding Door Cupboard SLG+SLB+SLS 304	1	ViengNinhom Furniture	17/08/2000	124.79	124.79
Chair	20	ViengNinhom Furniture	17/08/2000	10.86	217.16
Office Table	12	Koud Furniture Shop	19/08/2000	52.96	635.59
Chair	12	Koud Furniture Shop	19/08/2000	5.83	69.92
3. Additional Laboratory Equipment	1 lot	Diethelm & Co., Ltd	21/10/2002	2,751.11	2,751.11
4. Additional Land Use Planning Equipment	1 lot	Diethelm & Co., Ltd	26/12/2002	14,162	14,162
5. LDCs Office Equipment:					
Two-Wheel Tractors	2	Xam Neua Shop	18/02/2003	660.38	1,320.75
Computer: PC Celeron C -1.2 GHZ, Monitor, key-board and UPS	2	PSM Service	11/06/2003	902.5	1,805
Printer Lexmark	2	PSM Service	11/06/2003	150	300
<b>C. Vehicles</b>					
1. Toyota Hi-Lux	2	Phonesay Showroom TOYOTA Auto Sales	19/04/2000	25,000	50,000
2. Toyota Hi-Lux	2	Phonesay Showroom TOYOTA Auto Sales		25,000	50,000
3. Motorcycle: Honda WAVE	6	Phonesay Showroom TOYOTA Auto Sales	19/04/2000	1,300	7,800
Suzuki DK 125	6	Phonesay Showroom TOYOTA Auto Sales	19/04/2000	2,900	17,400
4. Motorcycle: Honda WAVE	20	Vongjalern Service	30/03/2001	1,255	25,100
5. 2 Backhoe Loader	2	Diethelm & Co.,Ltd	02/05/2001	54,293	108,586
6. Motorcycle: Honda Dream Model: ND125	6	PSM Service	21/11/2003	950	5,700

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	<b>Item Description</b>	<b>Qty</b>	<b>Supplier</b>	<b>Date (Order)</b>	<b>Unit Price (\$/unit)</b>	<b>Total (\$)</b>
7.	Vehicle: Hyundai 1 Ton H100 Year 2003	1	PSM Service	21/11/2003	12,450	12,450

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LUP/LA = land use planning/land allocation.

Source: ADB Project Completion Report Mission, February 2007

## ECONOMIC REASSESSMENT

### A. Background

1. The Project aimed to reduce the extent of shifting cultivation by introducing sustainable sedentary farming systems while providing for improved standards of living, not only from a livelihood perspective but in broader socioeconomic terms. Central to the benefit stream generated under the Project was the establishment and rehabilitation of the two rural road alignments that connected the project area to national route 6 (NR6), together with village tracks linking the two main routes to the 52 target villages. This access provided the key to all the reported project benefits. The improved access to markets has allowed the villagers to sell surplus produce from stabilized production systems, and allowed diversification into other forms of income generating agriculture. In particular livestock numbers have doubled with larger animals being traded outside the target area, and nonagricultural activities such as weaving. It has also provided access to other public services such as health and education that were denied prior to the Project.

2. The reassessment of the economic analysis therefore evaluates incremental household incomes generated from increased productivity, diversified production systems, and off-farm income generating activities. Although benefits also accrue from improved access to education and health services, and reduced incidence of waterborne disease from the establishment of village water supply systems, the analysis does not attempt to quantify these benefits. The benefits from capacity building initiatives are considered to have been expressed through the improved support services to agricultural production that are captured in increased yields, while the land tenure initiatives were considered a necessary prerequisite to sustainable production systems and should therefore be assessed as part of the overall benefits accruing from the Project.

### B. The Project

3. The Project established two access roads (56 kilometers [km]) and about 77 km of feeder tracks to improve access within and outside the project area (Nam Ven and Nam Ham). It established additional classrooms in 15 schools, two local development centers, three markets, 209 hectares (ha) of irrigation, and four main access bridges. This infrastructure provided the incentive to change from shifting cultivation systems that, together with improved land ownership entitlements, enabled increased household incomes. Under the influence of this investment in infrastructure and other efforts at reducing dependence upon opium, the impact has been to (i) reduce the dependence on shifting cultivation, i.e., upland rice; (ii) increase the area under irrigated paddy production by about 300 ha; (iii) reduce upland cultivated areas by about 500 ha; (iv) double livestock numbers in the case of cattle, pigs, and poultry, while goat numbers have increased six fold; and (v) increase the number of families with weaving looms from 900 to 1,350 during the life of the Project. Each of these benefits is considered to be a direct consequence of project investments supported by the extensive capacity building delivered under the Project.

### C. Methodology

4. The economic analysis attempts to capture benefits from the changed farming systems, reduced rice shifting cultivation, increased irrigated production, and other on- and off-farm income generating initiatives. To assess the change, with and without the project scenarios were considered. The main economic activities are used to assess representative benefits throughout all villages. The models developed assess benefit streams from increased cattle and

pig rearing (fattening models were adopted as the variation in production systems is diverse but benefits are representative), increased irrigated paddy production, and reduced production of upland rice as the main upland crop under more stabilized production systems. The models developed analyze production per unit area and household in the case of livestock, in financial and economic terms. It applies the actual changes in areas cultivated and numbers reared throughout the project area as a means of generating total project benefits. The incremental net benefits are then compared to the costs in constant 2007 terms with costs being adjusted by the manufacturing unit value index for foreign costs and local inflators for the local currency—the kip—discounted to provide an estimate of the economic internal rate of return (EIRR). The disbursement pattern of the Asian Development Bank (ADB) loan was used as a proxy variable to estimate annual costs that were applied to the total project cost including financing by the Government and United Nations Office of Drugs and Crime.

#### **D. Cost and Price Assumptions**

5. Financial prices used in the analysis are identified from data in past project documents and assessed in 2007 US dollars and from field investigations during the Project Completion Review Mission; foreign costs are adjusted by the manufacturing unit value index as published by the *World Bank Commodity Outlook*, May 2007. Economic prices are based on the following:

- (i) use of a world price numeraire for traded goods;
- (ii) values expressed in constant 2007 prices to exclude inflation;
- (iii) for nontraded goods and services, use of a standard conversion factor of 0.9 and a shadow wage rate factor of 0.85;
- (iv) for major tradable commodities (rice, maize, coffee, and fertilizers), economic values based on border parity pricing with standard methods for deriving farm-gate input/output prices; and
- (v) exclusion of transfer payments such as taxes, duties, and subsidies in the calculation of economic values.

The estimation of costs for the operation and maintenance of infrastructure rehabilitated or established under the Project is based on routine maintenance estimated at 3% of investment cost annually and periodic maintenance estimated at 30% of the investment cost every 10 years.

#### **E. Economic Models**

6. The models assess the incremental benefits from increased dependence upon irrigated paddy production by 300 ha at a yield of 3 tons/ha; a reduction in the area of shifting cultivation, in this case upland rice cultivated on 700 ha; and a small increase in productivity from existing rain-fed paddy areas (1.8–2.2 tons/ha) due to improved management and increased availability of production inputs (fertilizer and chemicals for weed, insect, and disease control). The pig-fattening model without the Project assumes the purchase of four 20-kilogram piglets, rearing them to 70 kilograms over 12 months based on poor quality locally available feed supplies. Incremental benefits are achieved from increased numbers raised by pig-rearing households to eight piglets per fattening cycle and the cycle period being reduced from 12 to 10 months under the influence of improved feed supplies and access to veterinary services. Benefits assessed in the model also include 20% of households that previously did not raise pigs but have commenced new production given the improved access to markets, credit, and technical support services. Adoption rates assumed were 20% of all households in the first 2 years and 30% in the third. Benefits from increased pig production were delayed to correspond with the completion of the roads that reflect the actual situation as observed from field interviews. About

70% of households reared pigs at the start of the Project, the number increasing to 77% by project completion<sup>1</sup>.

7. Production parameters assumed for the cattle-fattening model are that without the Project, cattle-rearing households fattened three 1-year-old calves holding them for 24 months to maturity and feeding them with locally available forage and grass in an uncontrolled or free-ranging manner. The with-project scenario increased the number of animals to five and reduced the time required to 18 months in view of the improved veterinary treatments and better understanding of the nutritional requirements for rearing cattle. The adoption rate of the new production system with the Project assumes 15% for the first 2 years then 5% in the third year. In addition, 5% of non-cattle-rearing households are assumed to have commenced cattle-fattening rearing after the market became more accessible, feed inputs were introduced (Styloxanthes), and access to animal health treatments such as anthelmintics (parasiticides) was improved. Some 28% of households rear cattle and these tend to be the better-off farmers given the capital requirements to purchase large ruminants.

8. Poultry benefits are based on the fact that nearly all households rear poultry but that individual numbers per household have almost doubled under the Project. Traditionally most domestic poultry production was consumed in the village. But with the improved access, traders could access these more remote areas to source poultry for the provincial market in Xam Neua. Poultry numbers have responded to this opportunity as well as providing improved dietary needs of the local villagers. The model assumes that the average household has about 12 animals that produce eggs and chickens on an ongoing basis. The improved access to vaccines has reduced the incidence of disease and significantly reduced mortality rates, allowing increased sales of poultry from the household. Also the improved biosecurity<sup>2</sup> promoted by the Project contributed to improved management that enabled greater sale of poultry.

9. The single most significant financial benefit achieved under the Project was the diversification away from agricultural to nonagricultural activities. Weaving and handicraft output increased to the extent that villagers did not need to rely upon upland rice for their immediate food supply and were able to generate sufficient cash resources from the sale of weaving and handicraft products to purchase their food requirements. This was also compensated for by the fact that irrigated production was substituted for shifting upland rice cultivation and the relative yields were 3 tons/ha compared with 1.2 tons/ha. Consequently the reduction in shifting cultivation was neutralized by the irrigated production. However, the analysis assesses the impact from increased households with looms (two per household on average) weaving for about 30% of the year divided into producing both cotton and silk products on a basis of 60:40. Villagers use imported silk and cotton (from Viet Nam) that are readily available in Xam Neua on looms manufactured locally (KN100,000). Traders now visit the villages to source material for sale in Vientiane and also as far as Singapore for the higher quality silk items. The benefits have been assessed on cotton and silk sinhs (the traditional Laotian dress) at KN11,000 and KN45,000 respectively in the village.

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<sup>1</sup> Numbers of households raising the various species were extracted from the livestock systems survey completed in Houaphanh in 2005 as described in: ADB. 2001. *Report and Recommendation of the President to the Board of Directors on Proposed Loan to the Lao People's Democratic Republic for the Northern Region Sustainable Livelihoods through Livestock Development Project*. Manila (Loan 2259 for US\$9,300,000, approved on 29 September 2006).

<sup>2</sup> Biosecurity refers to protecting the health of livestock by preventing the transmission of disease.

**Table A11.1: Financial and Economic Prices Used in the Analysis**  
(constant 2007 dollars)

Item	Unit	Financial Prices	Conversion Factor <sup>a</sup>	Economic Prices
<b>Crops</b>				
Rice	T	2,100,000	0.94	1,974,021
Rice bran				
Wet season	kg	350	0.94	329
Dry season	kg	200	0.94	188
Seasonal average <sup>b</sup>	kg	263	0.94	247
Maize	T	860,000	1.26	1,081,315
Maize seed	kg	19,000	1.26	23,890
Urea	kg	4,500	0.88	3,975
DAP	kg	5,000	0.89	4,427
Pesticide chemicals (for maize)	lumpsum	100,000	1.00	100,000
Other maize inputs	lumpsum	100,000	1.00	100,000
Stylo seed	kg	15,000	1.00	15,000
<b>Animals</b>				
<b>Pigs</b>				
	20 kg	250,000	0.90	225,000
	50 kg	400,000	0.90	360,000
	70 kg	630,000	0.90	567,000
Vaccine/medicines	pig/yr	10,000	1.00	10,000
Pen materials cost (4 yrs)	3–4 pig size	100,000	0.90	90,000
Pig manure	T	60,000	0.90	54,000
<b>Cattle</b>				
1-yr old wet season	each	1,000,000	0.90	900,000
1-yr old dry season	each	800,000	0.90	720,000
1-yr old seasonal average <sup>b</sup>	each	883,333	0.90	795,000
2-yr old wet season	each	2,500,000	0.90	2,250,000
2-yr old dry season	each	2,250,000	0.90	2,025,000
2-yr old seasonal average <sup>b</sup>	each	2,354,167	0.90	2,118,750
post-fattened	each	3,250,000	0.90	2,925,000
Vaccine/medicines	animal/yr	2,000	1.00	2,000
Cattle manure	T	40,000	0.90	36,000
<b>Poultry</b>				
Pullets	each	15,500	0.90	13,950
Cockerels	each	20,600	0.90	18,540
Hens	each	20,600	0.90	18,540
Cocks	each	27,800	0.90	25,020
Newcastle Disease vacc.	10 hen flock	113,800	1.00	113,800
Fowl Cholera vaccine	10 hen flock	200,700	1.00	200,700
Pen improvement materials	lumpsum	50,000	0.90	45,000
<b>Labor</b>	Day	10,000	0.80	8,000

<sup>a</sup> Tradable crop conversion factors from Table 1.

SCF: 0.90 SWRF: 0.80

<sup>b</sup> Seasonal average price is the weighted average over the 5-month wet season and 7-month dry season.

Exchange rate: kip/\$

Source: ADB Project Completion Report Mission, February 2007

## F. Results of the Reassessment

10. Based on the models adopted for the reassessment, the Project was able to demonstrate a return greater than the opportunity cost of capital. This was achieved taking into account all project costs, including the high unit cost of rural infrastructure in these remote areas, and the relatively high consulting service inputs in view of the limited management resources available in the province. The incremental benefits from increased livestock production, reduction in upland cropping, expansion of irrigated production of rice, and

significant incremental increase in off-farm income generated from weaving have a combined net present value (at 12%) of KN72 billion compared to the equivalent of KN65 billion of total costs producing a benefit:cost ratio of 1.12. The reassessment resulted in an estimated EIRR of 13.8%. This did not take into account the very significant benefits from improved education services, improved health from the upgraded water supplies, or any cost savings incurred from the reduced transport charges for people and goods along the rehabilitated alignments (traffic volumes remain relatively small and benefits from this source would not have justified the investment on economic grounds). The estimated EIRR is presented in Table A11.2.

**Table A11.2: Reassessment of Project EIRR**  
(constant 2007 KN10,000)

Year	Project Benefits					Total	Project Costs	Economic Cash Flow
	Crops	Livestock			Off Farm			
	Rice	Pigs	Cattle	Chickens	(Weaving)			
	Incremental Economic Net Revenue	Incremental Economic Net Revenue	Incremental Economic Net Revenue	Incremental Economic Net Revenue	Incremental Economic Net Revenue	Incremental Economic Net Revenue		
1	—	—			—	—	1,332,908	(1,332,908)
2	10,834	—			2,582	13,416	1,653,447	(1,640,031)
3	21,668	27,631	(12,944)	(14,737)	12,928	34,546	958,931	(924,385)
4	32,502	63,046	(1,390)	(18,545)	671,316	746,930	1,726,050	(979,120)
5	43,336	86,325	35,056	3,314	1,024,932	1,192,964	2,416,236	(1,223,272)
6	43,336	102,622	59,542	25,173	1,066,356	1,297,029	504,838	792,191
7	43,336	111,930	75,490	47,032	1,159,594	1,437,382	485,850	951,532
8	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
9	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
10	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
11	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
12	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
13	43,336	111,930	75,490	57,962	1,159,594	1,448,311	599,063	849,249
14	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
15	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
16	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
17	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
18	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
19	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
20	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
21	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
22	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
23	43,336	111,930	75,490	57,962	1,159,594	1,448,311	599,063	849,249
24	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
25	43,336	111,930	75,490	57,962	1,159,594	1,448,311	59,906	1,388,405
<b>EIRR</b>								13.8%
<b>NPV</b>						7,243,772	6,494,075	1.12

EIRR= 13.8% , NPV= 1.12.

— not available

### G. Sensitivity of EIRR Estimates

11. Sensitivities were run for the main variables: animal prices, adoption rates for the improved production technologies, time taken to fatten livestock, and the overall benefit stream from all sources. In view of the diverse nature of benefits from the Project (i.e., including on-farm benefits and off-farm income generating initiatives, the model is less sensitive to changes in the overall benefit stream. The most significant variable likely to cause a significant reduction in the overall benefit from the investment is that of the maintenance of the rural access roads and village tracks. If routine and periodic maintenance is lacking, the EIRR declines significantly as would be expected. The return of the villages to the pre-project situation is unlikely as one alignment was a new alignment. However, the sensitivity to satisfactory maintenance demonstrates the need to ensure budget allocations to keep the road in effective working order.

**Table A11.3: Sensitivity Analysis of the EIRR to Major Risk**

Item		EIRR	Switching Value	Sensitivity
<b>Base case</b>		13.8%		
Adoption rates decrease	20%	10.2%	62.0%	1.30
Animal prices decrease	20%	13.0%	42.0%	0.30
Increase in fattening time "with"	20%	13.0%	21.0%	0.31
Decrease in years of project	5 yrs	9.1%	6 yrs	
Incremental Benefit decrease	20%	12.7%	11.0%	0.41

EIRR: Economic Internal Rate of Return

12. The economic reassessment of project benefits suggests that the impact from the Project has been positive and that the benefits should be sustained given the right maintenance program on the infrastructure established. The analysis did not take account of the other very obvious benefits that would also accrue from installation of village water supplies, the labor saving from not having to allocate time fetching water, and the improved health from clean water supplies and sanitation facilities. Finally, though not quantified, the impact upon the environment of reduced shifting cultivation would be significant. The Project has demonstrated that with appropriate measures to generate alternate household income sources and to assure essential supplies of their staple food, the stabilization of upland production systems can be achieved without loss of the villagers' socioeconomic conditions.

## OVERALL PROJECT ASSESSMENT

The overall rating of the Project is summarized in Table A12 based on the Asian Development Bank *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations* (2006).

**Table A12: Overall Project Assessment**

<b>Criterion</b>	<b>Weight (%)</b>	<b>Rating Description</b>	<b>Rating Value</b>
1. Relevance	20	Relevant	0.4
2. Effectiveness	30	Effective	0.6
3. Efficiency	30	Less efficient	0.3
4. Sustainability	20	Likely	0.4
<b>Overall Assessment</b>		<b>Successful</b>	<b>1.7</b>

Source: ADB Project Completion Report Mission, February 2007