Completion Report

Project Number: 36432
Loan Number: 2116-PRC
June 2013

People's Republic of China: Dali–Lijiang Railway Project

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal	At Project Completion
		1 Sep 2004	9 July 2012
CNY1.00	=	$0.1208	$0.1571
$1.00	=	CNY8.277	CNY6.365

ABBREVIATIONS

ADB	–	Asian Development Bank
AFD	–	Agence Française de Développement
BOA	–	boundaries of analysis
DBMAP	–	Dali Bai Minority Autonomous Prefecture
DLR	–	Dali–Lijiang railway
DMF	–	design and monitoring framework
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMDP	–	ethnic minorities development plan
EMP	–	environmental management and monitoring program
EMR	–	environmental monitoring report
FIRR	–	financial internal rate of return
GDP	–	gross domestic product
GMS	–	Greater Mekong Subregion
LAR	–	land and acquisition resettlement
MOR	–	Ministry of Railways
PCR	–	project completion report
PMO	–	project management office
PRC	–	People’s Republic of China
SEIA	–	summary environmental impact assessment
SEPA	–	State Environmental Protection Administration
TA	–	technical assistance
WACC	–	weighted average cost of capital
WYRC	–	West Yunnan Railway Company
YEAC	–	Yunnan Ethnic Affairs Commission

WEIGHTS AND MEASURES

km	–	kilometer
km/h	–	kilometer per hour
mu	–	unit of area equivalent to 667 square meters
p-km	–	passenger-kilometer
m^2	–	square meter
t-km	–	ton-kilometer

NOTES

(i) The fiscal year of the government and its agencies ends on 31 December.

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

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CONTENTS

BASIC DATA

A. Loan Identification

1.	Country	People's Republic of China
2.	Loan Number	2116-PRC
3.	Project Title	Dali–Lijiang Railway Project
4.	Borrower	Ministry of Finance, People's Republic of China
5.	Executing Agency	West Yunnan Railway Company
6.	Amount of Loan	$180 million
7.	Project Completion Report Number	PCR: PRC 1397

B. Loan Data

1.	Appraisal	
	– Date Started	16 August 2004
	– Date Completed	25 August 2004
2.	Loan Negotiations	
	– Date Started	18 October 2004
	– Date Completed	18 October 2004
3.	Date of Board Approval	2 December 2004
4.	Date of Loan Agreement	27 June 2005
5.	Date of Loan Effectiveness	
	– In Loan Agreement	25 September 2005
	– Actual	14 November 2005
	– Number of Extensions	1
6.	Closing Date	
	– In Loan Agreement	30 June 2010
	– Actual	9 July 2012
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	LIBOR-based
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
8.	Terms of Relending (if any)	Not applicable
	– Interest Rate	
	– Maturity (number of years)	
	– Grace Period (number of years)	
	– Second-Step Borrower	
9.	Disbursements	
	a. Dates	

Initial Disbursement	Final Disbursement	Time Interval
13 December 2005	15 June 2012	78 months
Effective Date	**Original Closing Date**	**Time Interval**
14 November 2005	30 June 2010	55 months

b. Amount ($ million)

Category or Subloan	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
Civil Works	93.30	124.94	0.00	124.94	124.93	0.01
Equipment	27.80	6.91	0.00	6.91	6.91	0.00
Materials	48.50	48.15	0.00	48.15	48.15	0.00
Consulting Services	0.40	0.00	0.00	0.00	0.00	0.00
Unallocated	10.00	0.00	0.00	0.00	0.00	0.00
Total	**180.00**	**180.00**	**0.00**	**180.00**	**179.99**	**0.01**

C. Project Data

1. Project Cost ($ million)

Cost	Appraisal Estimate (million)		Actual (million)	
	CNY	**US$**	**CNY**	**US$**
Foreign Exchange Cost	1,820.94	220.00	1,395.34	219.22
Local Currency Cost	2,714.86	328.00	3,700.80	581.43
Total	**4,535.80**	**548.00**	**5,096.14**	**800.65**

2. Financing Plan ($ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	311.80	564.38
ADB Financed	180.00	179.99
AFD Financed	40.00	39.23
Subtotal	**531.80**	**783.60**
IDC Costs		
Borrower Financed	16.20	17.05
ADB Financed	0.00	0.00
AFD Financed	0.00	0.00
Subtotal	**16.20**	**17.05**

ADB = Asian Development Bank, AFD = Agence Française de Développement, IDC = interest during construction.

3. Cost Breakdown by Project Component ($ million)

Component	Appraisal Estimate	Actual
A. Base Cost		
1. Railway works, facilities, and equipment	470.80	610.23
2. Administration, land acquisition, consulting services, and environmental protection	41.70	173.37
Subtotal (A)	**512.50**	**783.60**
B. Contingencies		
1. Physical contingencies	15.70	0.00
2. Price contingencies	3.60	0.00
Subtotal (B)	**19.30**	**0.00**
C. Interest during construction	16.20	17.05
Total	**548.00**	**800.65**

4. Project Schedule

Item	Appraisal Estimate	Actual
1. Date of Contract with Consultants[a]	Not Applicable	
2. Detailed Design, Engineering, and Documentation		
Commencement	Jan 2004	Jan 2004
Completion	Aug 2004	Oct 2004
3. Prequalification and Tendering		
Commencement	Sep 2004	Nov 2004
Completion	Dec 2006	Feb 2008
4. Land Acquisition and Resettlement		
Commencement	Jan 2005	Nov 2004
Completion	Dec 2006	Jul 2009
5. Construction of Civil Works and Buildings		
Commencement	Jun 2005	Jun 2005
Completion of Work	May 2008	Sep 2009
6. Track Laying		
Commencement	Jan 2007	Feb 2008
Completion	Dec 2008	Sep 2009
7. Telecommunications and Signaling		
Commencement	Jan 2007	Aug 2007
Completion	Dec 2008	Aug 2009
8. Trial Operations		
Commencement	1 Jan 2009	28 Sep 2009
Completion	31 Dec 2009	31 Dec 2010

[a] The consulting services for engineering design were financed by the executing agency and no longer requires ADB financing.

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 31 Dec 2004 to 31 Aug 2009	Satisfactory	Satisfactory
From 1 Sep 2009 to 31 Dec 2010	Satisfactory	Highly Satisfactory
From 1 Jan 2011 to 31 Dec 2011	Satisfactory	Satisfactory

D. Data on Asian Development Bank Missions

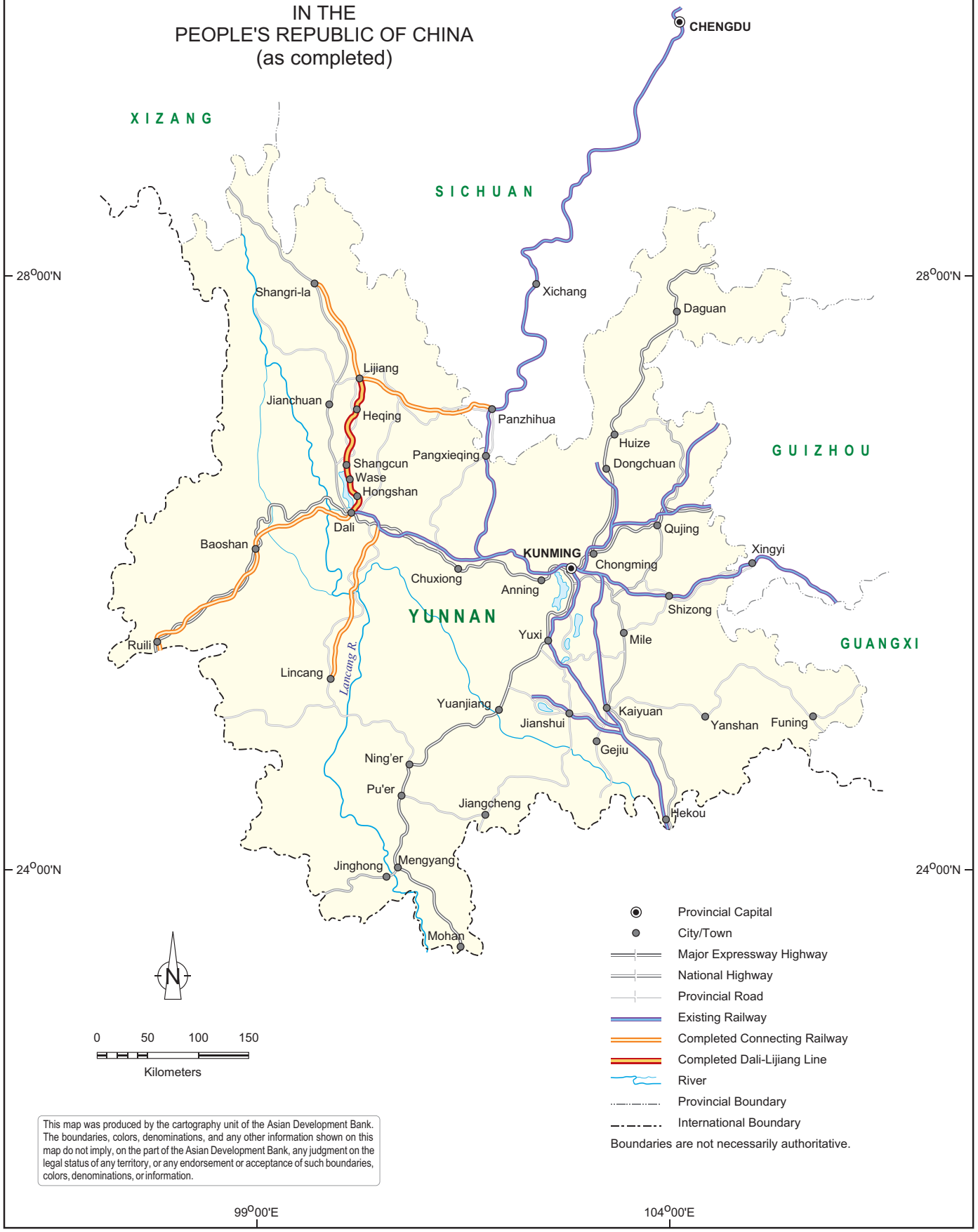
Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members[a]
Fact-Finding	11–23 Mar 2004	14	182	a,b,c,d,e1,e2,f,g,h,i,j,k,l,m
Consultation	2–8 Jun 2004	6	42	a,b,c,e1,n,o
Appraisal	16–25 Aug 2004	6	60	a,b,c,d,e1,p
Inception	14–18 Oct 2005	3	15	a,q,r
Loan Review 1	12–15 Dec 2006	1	3	s
Loan Review 2	5–9 Nov 2007	1	8	t
Loan Review 3[b]	24 Jun–2 Jul 2008	2	9	t,u
Midterm Review	14–20 Aug 2009	3	21	a,u,v
Loan Review 4	16–20 May 2010	1	5	a
Loan Review 5	14–19 Aug 2011	1	6	a
Project Completion Review	22 Oct–1 Nov 2012	6	36	a,d,e,w,x,y

Notes:

[a] a = transport specialist (railways) and mission leader; b = senior transport economist; c = resettlement specialist; d = environment specialist; e1 = young professional 1; e2 = young professional 2; f = director, transport and communications division, ; g = country director, People's Republic of China Resident Mission (PRCM); h = senior program officer, PRCM; i = finance officer, PRCM; j = senior cofinancing specialist; k = deputy director, Asia and Caribbean, Agence Française de Développement (AFD); l = senior project specialist, infrastructure and urban development, AFD; m = senior program officer, AFD; n = senior counsel; o = financial specialist; p = resettlement specialist, PRCM; q = associate project analyst; r = project officer, AFD; s = senior transport specialist and mission leader; t = senior social development specialist and mission leader; u = assistant project analyst; v = principal social development specialist (safeguards); w = social development (resettlement) specialist; x = senior operations assistant; y = transport economist, financial specialist, and staff consultant.

[b] Indigenous peoples safeguard review mission conducted by environment and safeguards division, regional and sustainable development department to review the project's safeguard compliance with Indigenous Peoples Policy of the Asian Development Bank. A technical assistance review mission for Support to Ethnic Minority Development Plan for the Dali–Lijiang Railway Project was fielded in April 2008, which also discussed the status of the monitoring and reporting of the EMDP for the project.

DALI–LIJIANG RAILWAY PROJECT
IN THE
PEOPLE'S REPUBLIC OF CHINA
(as completed)



I. PROJECT DESCRIPTION

1. Rapid economic growth since 1978 in the People's Republic of China (PRC) was accompanied by rapid increases in the demand for transport. During 1978–2003, total passenger transport grew by 9.2% annually, while freight transport grew at 7.1%. Railways were one of the primary modes of transport for long distance and bulk transport. In 2003, railway transport accounted for 34.7% of total passenger-kilometers (p-km) and 32% of freight ton-kilometers (t-km). Between 1978 and 2003, railway freight grew from 535 billion t-km to 1,725 billion t-km, equivalent to an annual growth rate of 4.8%, while passenger traffic increased from 109 billion p-km to 479 billion p-km, an annual growth rate of 6.1%.

2. At the end of 2003, the PRC's railway network was 73,000 kilometers (km) in length, comprising 60,446 km of national railways and 12,554 km of joint-venture and local railways. However, the network density in terms of railway km per 1,000 square km of land was only one-third of the level in India and one-tenth of the level in Japan, and did not provide adequate coverage for the PRC's population and land area. The existing capacity of the network was also being used very intensively. It had the highest freight transport density in the world and second-highest passenger transport density in the world after Japan. Locomotive turnover was the highest in the world.

3. Railway network capacity limitations had constrained economic and social development, particularly in less-developed areas, such as the western region, which were underserved by railways. The government had adopted ambitious plans to scale up railway network capacity and extend it to serve less-developed areas. The 10th five-year plan (2001–2005) targeted (i) construction of 6,000 km of new lines to increase the total length of railways to 75,000 km, (ii) provision of 3,000 km of double track and 5,000 km of electrification, and (iii) increase in operating speeds on 5,000 km of track. The expected investment cost was CNY350 billion, including CNY270 billion for construction and CNY80 billion for rolling stock. In 2004, the government approved a new railway development plan up to 2020. The plan aimed to expand the railway network to 85,000 km by 2010, and to 100,000 km by 2020, with priority given to extending services to less-developed areas. The route network length in the western region was expected to reach 16,000 km by 2020.

4. The project was located in the northwestern area of Yunnan, a landlocked, remote, and poor area in one of the least-developed provinces targeted by the government in its Western Development Strategy. The project area comprised 12 townships of Dali Bai Minority Autonomous Prefecture (DBMAP) and Lijiang city. It had a population of 1.1 million in 2003, of which about 75% were rural and 30% were poor, with an average per capita income of CNY900 in 2002. The project[1] was to develop an efficient, reliable, and affordable railway transport system to improve access and reduce transport costs in the project area and promote local economic development, especially tourism, with an ultimate goal of promoting sustainable economic growth and reducing poverty in the northwestern part of Yunnan province. It was to deliver three outputs: (i) the 167 km Dali–Lijiang railway (DLR), including stations and access roads; (ii) employment opportunities for poor and vulnerable groups; and (iii) strengthened institutional capacity for the West Yunnan Railway Company (WYRC). The project components were (i) laying railway track consisting of rails and accessories, concrete sleepers, and stone ballast; (ii) constructing 11 new railway stations complete with facilities; (iii) a safety component that included providing modern technology and equipment for signaling, communications, a

[1] ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the People's Republic of China for the Dali–-Lijiang Railway Project*. Manila.

dispatch management information system, freight yard operation, operational safety equipment, and mechanized maintenance of tracks; (iv) installing e-governance and management information systems, including computerization and linking Dali and Lijiang to the national railway network; (v) supplying environmental mitigation and protection equipment and facilities; (vi) training on the use and maintenance of equipment provided under the project; and (vii) strengthening institutional capacity.

5. In 2011, to align with the revised guidelines of the Asian Development Bank (ADB) on design and monitoring frameworks (DMFs), the project DMF was revised and streamlined. Terminology such as "goal" and "purpose" were revised to "impact" and "outcome"; two statements for the project purpose were changed into one outcome statement; and indicators, assumptions, and activities were rationalized. The revised project DMF which was retrofitted in eOps is in Appendix 1.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. The project design was fully in line with government priorities and ADB's country strategy. At the time of project preparation, the Government of the PRC was pursuing rapid expansion of the railway network, and the Western Development Strategy had targeted 12 western provinces and identified transport including railways as a priority. ADB's country strategy sought to promote pro-poor economic growth by enabling greater access of the poor to the benefits of economic prosperity. In the railway sector, it focused on helping to (i) expand the railway system by constructing new lines in unserved, less-developed areas; (ii) modernize and increase capacity to improve efficiency on key routes of the national railway system; (iii) commercialize railway operations to improve efficiency; and (iv) increase railway competitiveness in the transport sector through restructuring and reform.

B. Project Outputs

7. **Output 1: Construction of the 167 km Dali–Lijiang railway, including stations and access roads.** By September 2009, the following works were completed: (i) 11.4 million cubic meters of earthwork and rockwork for subgrade; (ii) 80 bridges with a total length of about 22.5 km; (iii) 47 tunnels with a total length of 78.6 km; (iv) 331 culverts with a horizontal linear length of 7.33 km; (v) 207.8 km of track laying with 170 track switches; (vi) installation of safety equipment for signaling, communications, power supply, e-governance and management information systems, and track maintenance equipment; (vii) 34,890 square meters (m^2) of railway buildings and 10 railway stations;[2] and (viii) 139 km of access roads connecting railway stations to the nearest counties or townships. While the initial design was for diesel–electric operation, provision was made for future electrification. Design modifications were made to enhance railway safety and comfort and mitigate environmental impacts during implementation. To reduce the noise of train movement and improve riding comfort, 50 kilogram (kg) jointed rail was replaced with 60 kg continuously welded rail. Additional "green environment corridor" improvements were made along the railway with about 12,000 m^2 of noise barriers constructed to make the project more environmentally friendly. For operating safety and efficiency, the train control system was changed from a train dispatching command system to centralized traffic control. The project began trial operations on 28 September 2009 and was put into commercial service on 1 January 2011.

[2] The 11th railway station was completed in 2011.

8. The DLR is of satisfactory quality and meets the normal operational speed requirement of 120 km per hour (km/h). On 25 September 2010, a preliminary acceptance inspection committee organized by the Ministry of Railways (MOR) and the Kunming Railway Bureau concluded that construction of the project was fully compliant with relevant policies, codes, regulations, and mandatory standards of the government and the MOR. The final acceptance inspection is expected in July 2013.

9. The DLR has been integrated into the national railway network, connecting the project area to Kunming, Shanghai, and Beijing. It is 20 km shorter than the Dali–Lijiang road, and offers passenger tariffs significantly lower than bus. It has become a major mode of transport for the local people.

10. **Output 2: Employment opportunities generated for poor and vulnerable groups.** At appraisal, it was anticipated that (i) 96,800 person-years of construction-related employment would be created; (ii) about 60% of the created jobs would be for unskilled labor; and (iii) at least 50% of the unskilled labor jobs would be for the poor, ethnic minorities, and women. The executing agency reported that construction activities directly provided 87,687 person-years of employment, including about 35,952 person-years (41%) of unskilled labor, and that about 19,773 person-years (55%) of unskilled labor were hired from the local market. Ethnic minorities made up 78% of the unskilled local labor and women 10%. Average daily wages ranged from CNY30 to CNY80. The executing agency attributes the lower percentage of unskilled labor to increased mechanization during construction. For operation of the DLR, the WYRC has employed 356 people, of whom 91 (25.5%) are from ethnic minorities and 105 (29.5%) are women. They are employed mostly in unskilled work. In addition, the WYRC used about 21,000 person-months of national consulting services during construction to ensure that the project was constructed in accordance with the national standards and ADB's requirements, and supply of equipment and local procurement of construction materials and supplies also indirectly provided many further employment opportunities.

11. **Output 3: Institutional strengthening for the West Yunnan Railway Company.** At appraisal, it was envisaged that ADB-financed international consulting services with an estimated cost of $400,000 would be needed to develop an effective marketing program to attract tourism and new industry along the DLR. However, in 2010, with assistance from the Kunming Railway Bureau, the executing agency developed a marketing strategy and long-term business development program. In 2011, the borrower requested cancellation and reallocation of the funds for the consulting services component to the civil works component; ADB approved this in September 2011. The cancellation was considered a minor change in project scope and did not affect the project outcome indicators. The program is being implemented, and on-the-job training was conducted during 2009–2012. Implementation of the program resulted in several service agreements with potential major clients and is expected to attract 4.7 million–8.4 million tons of freight traffic annually to the DLR during 2015–2019.

C. Project Costs

12. The actual project cost was $800.65 million, 46% higher than the appraisal estimate of $548.0 million.[3] The higher cost was mainly due to (i) local currency appreciation of about 30%

[3] In local currency terms, the actual project cost was CNY5,096.14 million, which was 12% higher than the appraisal estimates of CNY4,535.80 million.

from 2004 to 2011;[4] (ii) 20%–50% price increases for construction materials such as steel, cement, sand, and stone compared with the predicted price at appraisal because of high inflation; (iii) design modifications including (a) upgrade to 60 kg continuously welded rail, (b) additional environment work of "green environment corridor";[5] and (c) upgrade of the train dispatching command system to a centralized traffic control system; (iv) increased compensation for land acquisition and resettlement; and (v) more consulting services recruited. The large-scale variation in construction material prices led the contractors of civil works to slow the progress of construction in anticipation of prices coming down. The design modifications were useful as they contributed to improved service quality, reduced maintenance costs, and more efficient and environmentally friendly operation. The cost overruns were financed by grants from the MOR and Yunnan province and bank loans from the National Development Bank and the Industry and Commerce Bank of China.

13. The financing plan envisaged at appraisal included (i) a loan of $180 million (33% of the total project cost) from ADB, (ii) a loan of $40 million equivalent (7% of the total project cost) from the Agence Française de Développement (AFD), and (iii) counterpart funds of $328 million equivalent (60% of the total project cost). The ADB and AFD loans were fully utilized. However, as a result of US dollar depreciation and cost increases, the actual financing share for the project decreased to 22.5% for ADB and 4.9% for AFD, while the domestic financing, including contributions from the MOR, Yunnan province, and domestic bank loans, rose to 72.6% of the actual project cost. The updated project cost and financing sources are in Appendix 2.

D. Disbursements

14. The ADB loan proceeds were disbursed through reimbursement, commitment letter, imprest account, and direct payment according to ADB's *Loan Disbursement Handbook*. Disbursement commenced in December 2005. Given the cost overrun, three reallocations of loan proceeds transferring savings under other items to the civil works and materials were approved—on 26 March 2007, 17 July 2008, and 15 November 2011. The last disbursement was for $1,187,049.41 on 15 June 2012. On the loan account closing date of 9 July 2012, total disbursement was $179,986,872.27 or 99.99% of the loan amount. The remaining unutilized amount of $13,127.73 was canceled. The ADB disbursement procedures followed were adequate and appropriate.

15. AFD managed disbursement of its funds. The total disbursement of the AFD loan was €32,856,932.00, or about $39.23 million equivalent (98.1% of the total AFD loan).[6] The remaining unutilized AFD loan amount of €643,068.17 was canceled. The projected and actual contract awards and disbursements are presented in Appendix 3.

E. Project Schedule

16. At appraisal, the project was planned to be implemented over a period of 5 years from January 2005 to December 2009, including 1 year of trial operation. Actual implementation took 7.5 years. The project was completed in September 2009, a delay of 9 months compared with the original schedule. After about 1 year of trial operation, commercial operation began in January 2011. This was about 1 year later than expected at appraisal. A chronology of major

[4] $1.00 = CNY8.277 at appraisal. $1.00 = CNY6.365 on the date of project completion (9 July 2012). In local currency terms, the actual project cost was CNY5,096.14 million, only 12% higher than the appraisal estimates of CNY4,535.80 million.

[5] Tree planting on both sides of the railway line.

[6] €1.00 = $1.229.

events is in Appendix 4, and the appraisal and actual implementation schedules are presented in Appendix 5.

17. The loan was approved on 2 December 2004. The loan agreement was signed on 27 June 2005, 6 months after loan approval, and became effective on 14 November 2005, 1.5 months later than the targeted effectiveness date of 25 September 2005. The signing and effectiveness reflected the executing agency's desire to align with the procurement and disbursement schedules so that commitment charges could be minimized, as well as time required for signing of the subsidiary loan agreement between the Ministry of Finance and the WYRC in October 2005.

18. The preliminary designs and other preconstruction project preparatory work were completed in October 2004, 2 months behind the original schedule. Land acquisition and resettlement commenced 2 months ahead of schedule in November 2004, but was only completed in July 2009, 2 years and 9 months later than expected at appraisal. This reflected the complex nature of land acquisition and resettlement activities. Procurement of civil works, materials, and equipment, according to the implementation schedule in the report and recommendation of the President, were to be conducted from September 2004 to December 2006. In practice, the first contract for $109.82 million was awarded in 2005, and all contracts were awarded by 2008.

19. Civil works under government financing started in June 2005 as scheduled, but track laying commenced 1 year later than scheduled. Installation of telecommunications and signaling equipment commenced in August 2007 and was completed in August 2009, 8 months behind schedule.

20. While physical completion of the project occurred in 2009, the last disbursement of the ADB loan was on 15 June 2012 and the loan was closed on 9 July 2012, almost 2.5 years after physical completion. This delay in completion of disbursement was because the WYRC had to conduct protracted negotiations with contractors over contract variation claims and obtain MOR approval for the agreed contract variation claims.

F. Implementation Arrangements

21. As envisaged at appraisal, the WYRC was the executing agency responsible for overall implementation of the project. The MOR was responsible for coordinating project management activities, supervising procurement of the goods and services financed under the project, and reviewing reports to be submitted to ADB. The WYRC established a project management office (PMO), the Dianxi Railway Construction Headquarters, which consisted of project management, safety and quality, planning and finance, materials and equipment, and general affairs departments. The Railway Second Design and Survey Institute was responsible for on-site construction survey and design, and the construction supervision units were the Southwest Jiaotong University Engineering Construction Supervision Company and Yunnan Railway Engineering Supervision Company.

22. A resettlement office was established at the PMO with resettlement units at the two field offices. These were supervised by the vice-chief of the PMO responsible for coordination, fund raising, internal monitoring for land acquisition and resettlement (LAR), information disclosure, consultation, complaints, supervision of land acquisition, building structure demolition, and relocation. The organization chart is presented in Appendix 6.

G. Conditions and Covenants

23. All 38 specific loan covenants were complied with or were not yet due at the time of project completion report (PCR) preparation. A project performance monitoring and evaluation report will be due for submission in 2013, 3 years after project completion. The operating ratio was 96% in 2011 but is expected to meet the 75% operational threshold by 2013 in compliance with the covenant. The WYRC's project accounts and financial statements were audited annually by the Audit Service Center of China National Audit Office for Foreign Loan and Assistance Projects, an external auditor, in accordance with auditing standards acceptable to ADB. The auditor's reports for 2006–2011 were submitted to ADB in a timely manner and were of acceptable quality. The issues identified focused on delays caused by design modifications and contract variations. The status of compliance with the loan covenants is in Appendix 7.

H. Related Technical Assistance

24. ADB-financed project preparatory technical assistance (TA) of $500,000 equivalent on a grant basis from ADB's TA funding program[7] was provided to help the government assess the technical, environmental, financial, economic, social, and institutional feasibility of the project. The TA identified the subregional context of the project, and the need for policy reforms, institutional capacity building measures, and introduction of new technology to ensure the long-term sustainability of the project. It conducted extensive consultations and enabled participation of stakeholders, nongovernment organizations, and the affected people, especially vulnerable and ethnic minority people and groups, in the project design. The TA started in July 2003 and was completed on 30 June 2004. The performance of the TA consultants was satisfactory.

25. In conjunction with the project, $150,000 small-scale TA[8] from ADB's TA Special Fund was provided to (i) assist poor ethnic minorities to benefit from the economic development associated with the project, (ii) assist local governments in providing capacity building and training to local people, and (iii) help design and implement local cultural preservation measures to strengthen cultural inheritance in the Dali–Lijiang area. The WYRC was the executing agency and the Yunnan Provincial Ethnic Affairs Commission the implementing agency. The Yunnan Nationalities University was contracted under single source selection and provided inputs of one international advisor and 13 national specialists. The consultants commenced services on 21 May 2007 and completed the work on 30 September 2008. The services included (i) capacity building and skill enhancement programs for the poor, vulnerable groups, and ethnic minorities, focusing on income generation, sustainability, community-based tourism, and cultural tourism; (ii) feasibility study for cultural protection and preservation; and (iii) an assessment of the measures taken or planned for preservation of local cultures and recommended further measures. The small-scale TA developed five characteristic ethnic training programs which were carried out successfully at selected sites. Two of these programs were continued after completion of the TA, both in Heqing county.[9] See Appendix 17 for more information on ethnic minorities development during the project.

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[7] ADB. 2003. *Technical Assistance to the People's Republic of China for Preparing the Dali–Lijiang Railway Project*. Manila.

[8] ADB 2004. *Technical Assistance to the People's Republic of China for Preparing the Support to Ethnic Minority Development Plan.* Manila.

[9] These consisted of Baiyi *suona* music in Liuhe township, and preservation of ancient books in the Heqing Library.

I. Consultant Recruitment and Procurement

1. Consultant Recruitment

26. The executing agency financed 18 national consulting firms with a total contract value of CNY98.9 million. The consultants were recruited in accordance with procedures followed in the PRC and acceptable to ADB. The services covered (i) project design and survey, (ii) international procurement, (iii) construction supervision and quality assurance, (iv) land acquisition and resettlement monitoring, (v) environmental monitoring and supervision, (vi) monitoring of and support to the ethnic minority development plan (EMDP), and (vii) socioeconomic development and poverty reduction assessment. The list of national consultant contracts is in Appendix 8.

2. Procurement

27. All contracts financed by ADB and ADB–AFD were procured in accordance with ADB's procurement guidelines through international competitive bidding. Two tendering companies were hired by the WYRC to provide tendering services—one for civil works and another for materials and equipment procurement. The contracts financed by the government were procured following domestic procedures acceptable to ADB. Of the 11 civil works contracts under the project, eight were financed by ADB (three of these were cofinanced by AFD). Another seven contracts for materials were financed by ADB while 23 contracts were under government financing,[10] and 12 contracts for equipment were financed by ADB while 144 contracts were under government financing.[11]

28. On 15 June 2004, ADB approved advance procurement action for civil works. ADB received the first batch of the prequalification documents for seven civil works packages on 18 November 2004 and approved the contract awards on 4 August 2005. The last civil works package was procured from 27 October 2005 to 19 December 2006. Procurement of seven materials packages was divided into two batches: (i) the first batch of four lots was procured from 5 December 2005 to 12 April 2006, and (ii) the second batch of three lots was procured from 20 July 2006 to 4 July 2007. The second batch took longer because one package was rebid because of changes in technical specifications. Procurement of 12 equipment packages was initiated on 16 May 2007, and contract awards were approved by ADB on 15 February 2008. There were no significant procurement problems. The details of the contract packages are in Appendix 9.

J. Performance of Consultants, Contractors, and Suppliers

29. The performance of the national consultants was satisfactory. The engineering design was completed on time and in accordance with national railway standards. On-site supervision, internal and external monitoring, and periodic inspections were conducted effectively. The national consultants provided specialized professional services which enabled the WYRC to cope with a range of challenges, especially engineering design involving complex geology, procurement following ADB guidelines, environmental protection, cultural relics, and ethnic minority development.

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[10] ADB financed materials supply contracts for prestressed concrete beam, steel bearing, and rail materials, while the WYRC financed electrification materials contracts.

[11] ADB financed equipment contracts for power, communication, and signaling equipment, while the WYRC financed electrification equipment contracts.

30. The contractors and suppliers performed satisfactorily. All civil works were mainly completed on schedule, except for the delay in construction of three tunnels—Heluoshan (5,848 m), Bijiashan #2 (3,850 m), and Baiya (8,435 m). During tunneling, it was found that the hydrogeological conditions were more complex than expected. The weathered rock strata in the areas of these tunnels were thicker, and there was more surface and underground water than anticipated. For safety, the contractors had to adjust their method of tunnel excavation which slowed the pace of construction.

K. Performance of the Borrower and the Executing Agency

31. The performance of the borrower, the WYRC (as the executing agency), and the MOR was satisfactory. A sound organizational framework for project implementation with clear delineation of responsibilities was set up and maintained during project preparation and implementation. The joint-venture arrangement between the MOR, Yunnan provincial government, and the WYRC combined each party's comparative advantages, mobilized resources, and was a useful step towards commercializing railway construction and operation. Sufficient counterpart funds were provided, including an additional CNY253 million to finance the cost overruns. Procurement of civil works, equipment, and materials was done without major delay or problems. Despite challenging topographical and geotechnical conditions, the project railway was constructed as designed and in accordance with the national technical standards, and construction quality was good. The social and environmental safeguards approved by ADB were implemented with a minimum of changes, and there was adequate external monitoring to report regularly on implementation progress, issues, and resolutions. The project accounts and financial statements were maintained separately and audited annually by an independent auditor and in accordance with auditing standards acceptable to ADB. Project progress reports were submitted periodically. The quality of the progress and audited reports was satisfactory, as was the WYRC's contribution to the PCR.

L. Performance of the Asian Development Bank

32. ADB's performance was satisfactory. The project was administered and supervised from ADB headquarters. During implementation, ADB fielded missions once a year and was in frequent communications with the WYRC and MOR. It helped identify potential problems and resolve issues. During the midterm review mission in August 2009, ADB provided useful guidance on environment, resettlement and ethnic minority development monitoring and reporting, procurement, and disbursement issues. ADB's timely approval of bidding documents, bid evaluation reports, loan reallocation requests, and extension of completion date contributed to the smooth and successful implementation of the project. Both the WYRC and MOR were satisfied with ADB's performance.

III. EVALUATION OF PERFORMANCE

A. Relevance

33. The project was *highly relevant* to the government's Western Development Strategy and Railway Development Plan up to 2020, which sought to scale up investment in railway network expansion in the PRC's western region. It was consistent with ADB's country and sector strategies which focused on helping to expand the railway system by constructing new lines in unserved and less-developed areas, and commercializing railway operations to improve efficiency.

34. The project was also in line with ADB's long-term strategic framework, Strategy 2020, which identifies regional cooperation as a key pillar of ADB support.[12] It contributed to improvement of rail connectivity in the Greater Mekong Subregion (GMS). Although the proposed project was not a GMS initiative at appraisal, it provided a link to the GMS railway network upon completion.

B. Effectiveness in Achieving Outcome

35. The project was *effective* in achieving its intended outcome to develop an efficient, reliable, and affordable railway transport system to improve access and reduce transport costs in the project area.

36. At appraisal, no railway services were available in the northwestern area of Yunnan. Travel by road from Lijiang to Kunming took 17 hours and from Lijiang to Dali 8 hours. This limited travel and movement of goods in the project area. The project significantly reduced travel time and cost—travel time from Lijiang to Kunming was reduced to 9 hours and from Lijiang to Dali 2 hours, and the cost was reduced from CNY0.38/km to CNY0.22/km. People in the project area can now easily travel to the major cities in the PRC by train. Travelling by train is safer, more convenient, and less costly, and has become the preferred mode for people frequently traveling out of the area and between villages. Many residents from Heqing county also take the train to Lijiang in the morning to sell their produce and return home by train in the evening.

37. The project has already contributed to lowering the cost of living for people in Lijiang and to improving the availability of products in the area. For instance, before the project, electronic goods were marked up 20%–30% compared with prices in Kunming; now prices are only slightly higher than in Kunming.

38. To promote development of industrial sidings and increase freight traffic, the MOR and WYRC have been making efforts to link the railway to larger-volume railway customers, improve transport efficiency and service quality, and establish partnerships with business entities. Six industrial sidings are expected to be constructed, three of which are scheduled for construction in 2013;[13] the remaining three are still at the planning stage.

C. Efficiency in Achieving Outcome and Outputs

39. The project was *efficient* in achieving its intended outcome and outputs. Although there were some delays, given the complexities of the resettlement and geological environment, implementation was reasonably efficient. While traffic volume in the initial operational years was less than the appraisal projection, the economic and financial reevaluation has confirmed that the project remains economically and financially viable.

40. **Traffic forecast.** The traffic forecast at appraisal was optimistic about the DLR's completion date and traffic volumes in the initial 5 years of operation. Traffic in the first year of commercial operations was less than projected at appraisal. Passenger traffic in 2011 was 2.02 million, which was 1.08 million less than the appraisal projection of 3.10 million for 2010. Freight traffic remained insignificant, even in 2012. However, traffic is expected to increase significantly as a result of the completion and opening of the East Lijiang freight station in 2011

[12] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

[13] Agreements on sidings have been concluded with (i) Jinsha River Hydropower Development, (ii) Huaneng Lancang River Hydropower Development, and (iii) Petro China Lijiang Depot.

which will divert some existing traffic from road to rail, the new traffic generated by several new industrial projects in Lijiang, and the addition of new railway lines connecting with the DLR. It is expected that traffic will exceed the appraisal projection by 2017 in the case of passengers and by 2020 for freight. A comparison of the original traffic forecast with the actual and revised forecast is presented in Appendix 10.

41. **Economic reevaluation.** The economic viability of the project (Appendix 11) was reevaluated based on the updated traffic forecast and the actual project investment and operating cost (expressed in 2004 prices). The economic benefits considered (i) operating cost savings for diverted freight and passenger traffic from roads, (ii) benefits attributed to generated passenger traffic, (iii) time saving for diverted passengers, and (iv) economic value of additional tons of generated traffic due to the new railway. The reevaluated economic internal rate of return (EIRR) is 14.5%, slightly lower than the EIRR of 17.0% estimated at appraisal. This is mainly because the traffic was lower during early years compared with traffic projected at appraisal. Sensitivity analyses were carried out through combinations of adverse effects of traffic decrease and operation and maintenance cost increase. The results show that the project maintains its economic viability under plausible scenarios of variability.

42. **Financial reevaluation.** The financial reevaluation (Appendix 12) was based on the actual construction costs (expressed in 2004 prices) and the updated traffic forecast, operating costs, and current passenger and freight tariffs. The reevaluated financial internal rate of return (FIRR) was calculated to be 4.6%, compared with 6.7% at appraisal. The primary reason for the lower FIRR is the delay in achieving forecast traffic levels, as well as the higher project construction cost. The reevaluated FIRR exceeds the weighted average cost of capital of 3.86%. While the WYRC incurred operating losses during the initial years of operation, it is projected to achieve a small net profit in 2012, with profits then increasing significantly during subsequent years. The project remains viable, despite the increased construction costs, because of the increased traffic from industries along the line, new industries under development, as well as traffic from new connecting lines either under construction or planned. This additional traffic was not considered during appraisal.

D. Preliminary Assessment of Sustainability

43. The project is rated *likely sustainable*. It is technically, economically, and financially sound. Environmentally, electrification of the Dali–Lijiang Railway in 2011 ahead of the original schedule[14] decreases energy consumption by nearly 60%[15] compared with internal combustion engine traction, and reduces emissions while increasing transport capacity by 40%.[16] This will further protect the natural beauty of Dali and Lijiang, which are attractive tourist destinations.

44. The WYRC has the necessary capacity to efficiently operate and maintain the project facilities. It has introduced a centralized traffic control system, one of the most advanced railway technologies in the PRC, which enables train movements to be dispatched and controlled more efficiently and reliably, while accommodating the increasing traffic and enhancing safety. The PRC railways have been maintained by segregated units, with respective maintenance plans, such as for track maintenance, power supply maintenance, communication system maintenance,

[14] Electrification of the Dali–Lijiang Railway was approved by the National Development and Reform Commission in November 2008 to be financed by the WYRC at a total cost of CNY470 million (about $74.57 million equivalent).
[15] WYRC staff indicated that energy costs for moving 1,000 tons on the Dali–Lijiang line is CNY520 with a diesel-electric locomotive and CNY220 with an electric locomotive.
[16] According to WYRC staff, the Dali–Lijiang line haulage capacity of a diesel-electric locomotive is 1,600 gross tons and that of an electric locomotive is 2,250 tons.

and signaling system maintenance. As a pilot reform of railway maintenance systems, the project established a comprehensive maintenance unit by integrating the above-mentioned various specialized units to carry out railway maintenance. Maintenance equipment is handled by experienced employees who have all undergone training. The new maintenance system has increased efficiency and reduced operating costs significantly, with only five staff per km compared with 15 staff per km previously.

45. In terms of financial sustainability, the WYRC has been implementing its marketing strategy and adjusting its services to the demand. Four railway investments are under construction or planned to extend the DLR's linkage with the national railway system and with GMS countries such as Myanmar, Thailand, and Viet Nam. It is expected that traffic for both passenger and freight will grow steadily and that the profitability of the WYRC will improve.[17]

E. Impact

46. **Socioeconomic impact.** The project has made significant contributions to sustainable economic growth and poverty reduction in the region. It has provided better access to (i) larger and more affordable markets; (ii) employment opportunities; (iii) safe, punctual, and low-cost transportation; and (iv) increased economic opportunities related to tourism and cross-border exchanges. It brought $871.96 million of investment directly to a poor area in one of the poorest provinces, and has been a catalyst for economic growth in the project area. During 2004–2011, the gross domestic product of the DBMAP increased by 16% annually, and of Lijiang city 19.8% annually, and per capita rural incomes in the DBMAP increased by 66%, in Heqing 147%, and in Lijiang city (Gucheng) 143%.[18] The highest increases were in Heqing and Lijiang city (Gucheng), which previously had no railway access. The number of key poverty reduction villages in the project area declined from 372 to 308, and poverty incidence declined from 30.0% (poverty line CNY900) in 2002 to 9.1% (poverty line CNY1,274) in 2010.[19] The social and poverty reduction impact of the project in the project area is reviewed in Appendix 14.

47. Tourism has increased dramatically in the project area since project completion, particularly in Heqing county, the poorest of the three counties. As a result of having a railway station, there has been rapid development of tourism-related activities and sites in Heqing, and the number of tourists increased by almost 500% between 2004 and 2011. Revenues from tourism increased by about 3,500% (from CNY52 million to CNY1,860 million).

48. Locally procured construction materials and supplies also provided employment opportunities in the project area. The WYRC estimated that about 20%–50% of construction materials used in civil works were locally procured, and about CNY705 million was spent in the local economy including for procurement of local materials, wages of local workers, living costs for construction workers from outside the area, office rental and equipment for construction contractors, fuel for construction machinery, costs of minor and major temporary works, and business tax for construction.

[17] The WYRC is owned by the MOR and the Yunnan provincial government. The participation of the Yunnan provincial government as a shareholder has proved to be a positive factor. The Lijiang city government has been actively encouraging industrial ventures to use the rail service and is developing an industrial park.

[18] In 2004, Lijiang city was divided into Gucheng district and Yulong Naxi autonomous county. Gucheng district falls in the project area; Yulong Naxi autonomous county is on the boundary of the project area.

[19] The percentage of people below the poverty line has been gradually decreasing since 2004. However, in 2011, the poverty line was raised to the national poverty line level of CNY2,300, resulting in a one-time increase in the number of people below the poverty line.

49. **Environmental impact.** ADB classified the project as environment category A. The domestic environmental impact assessment (EIA) was prepared in 2003 and was approved by the State Environmental Protection Administration (SEPA) on 26 October 2004. A summary environmental impact assessment (SEIA) including mitigation and monitoring measures was prepared for ADB in July 2004. The SEIA concluded that impacts from project construction would be mostly short term and reversible, while long-term impacts would result mainly from land conversion for the right of way and induced development. The final acceptance report for the domestic EIA was prepared in February 2012. The site review by the Ministry of Environmental Protection (formerly the SEPA) was carried out in November 2012, and finally approved on 28 January 2013. The domestic soil erosion acceptance report has been completed and will be submitted to the Ministry of Water Resources for approval by June 2013.

50. The final length of bridges and tunnels was 100.89 km, 62% of the total length of the project. Permanent land conversion was less than predicted and temporary land conversion slightly more. More than 90% of tunnel and excavation spoil was reused for construction earthworks and the need for borrowed soil was 75% less than predicted. Embankment slope stabilization and restoration of borrow pits, spoil disposal sites, construction camps, bridge engineering units, and haul routes have been completed to the required standard. Special measures were undertaken to minimize impacts during the construction parallel to Erhai Lake National Nature Reserve and across the Dongshan and Baitahe Rivers. Noisy construction activities were restricted to daytime hours, permanent noise barriers have been installed along 14 sections, and seamless rails along seven sections. Additional funding was agreed for the establishment of a green corridor of trees along the alignment not in tunnels or on bridges (38%). Some houses suffered cracks from blasting and there were some complaints of noise and dust, but these were resolved by the contractor (described in more detail in Appendix 15). Wastewater treatment plants constructed at each of the tunnel sites and concrete mixing plants have been handed over to the local government. Nine railway stations were provided with on-site sewage treatment systems to enable local reuse of wastewater for irrigation, and the staff living quarters have solar thermal heating systems. The change in traction from diesel to electric and modal shift of passengers and freight from road to rail will result in significant emission reductions. The overall investment in environmental protection measures was 5.15% of the total construction investment. Post-construction public consultation with affected persons has not identified any outstanding issues.

51. The nine semi-annual environmental monitoring reports (EMRs), and the findings of ADB review missions and the PCR mission, indicate that environmental mitigation and monitoring measures were implemented satisfactorily in accordance with the SEIA requirements and budget, and were effective in avoiding adverse environmental impacts. A detailed environmental management and monitoring program (EMP) was not developed as had been recommended, and there was no reporting on environmental quality monitoring as the environmental and water bureaus of Dali and Lijiang would not release the data. However, it was confirmed by the government counterparts that the required environmental and water quality standards were met. The EMP and monitoring limitations could have been identified and addressed by ADB at an earlier stage had there been more environment specialist input during implementation. The environmental impact analysis is in Appendix 15.

52. **Land acquisition and resettlement.** The project resulted in permanent land acquisition; temporary land occupation; and demolition of houses, schools, and enterprises. To deal with the LAR impacts of the project, a resettlement plan was prepared in accordance with domestic policies of the PRC and ADB's Involuntary Resettlement Policy (1995). Variations between planned and actual LAR impacts were not significant, except in the cases of temporary land

occupation and relocation of schools and enterprises. Actual permanent land acquisition of 6,228.7 *mu* was only slightly higher than the planned land acquisition of 5,913 *mu*.[20] Compared with the appraisal estimates of 4,159 people affected by permanent land acquisition, the number of people actually affected by partial land loss (about 20%) was 45,280. This difference was partly due to methodology and partly because the approach to resettlement in Gucheng district of Lijiang city was based on a readjustment of the remaining village land after acquisition to ensure that the peoples' agriculture-based livelihoods were not adversely affected, i.e., all villagers were affected by partial land loss instead of a few villagers being affected by total land loss. This increased the number of people affected by and compensated for permanent land acquisition. House demolition affected 554 households with 2,641 people, which was less than the planned demolition of 680 households with 3,150 people. The actual temporary land occupation of 3,567.1 *mu* was higher than the planned occupation of 1,600 *mu*. In addition, four schools were relocated compared to planned relocation of one school, and 14 enterprises were relocated against the planned relocation of one enterprise. The total cost of resettlement of CNY246.06 million compared with the original estimated budget of CNY141.00 million. The cost increase was mainly due to higher compensation rates paid for permanent land acquisition and house relocation. For example, compensation for permanently acquired paddy fields was CNY20,000 per *mu* against the planned compensation of CNY12,960 per *mu*.

53. Land acquisition and relocation for the project started in November 2004 and was completed by July 2009. As planned, compensation was provided to the affected people prior to dispossession or displacement and was provided for house relocation; permanent land acquisition; temporary occupation of land; and loss of fixed structures, facilities and attachments, businesses, and crops. The project relocated affected schools and enterprises satisfactorily, though in the case of Dali No. 3 Middle School there were some delays. The project provided financial and material support to vulnerable groups to relocate their houses. As outlined in the resettlement plan, affected persons were given preference in training programs and in unskilled employment generated by the project.

54. The resettlement office at the PMO took charge of LAR activities and established mechanisms for information dissemination, consultation, and redressing grievances of affected persons. Most grievances concerned construction-related problems such as noise and dust pollution, damage to the irrigation network, cracks appearing in houses because of blasting at construction sites, and compensation for fragmented and scattered land. The external monitor's reports indicate that in some cases there were delays in relocation and provision of amenities. The WYRC addressed and settled the grievances to the satisfaction of the aggrieved parties.[21] Measures outlined in the resettlement plan were undertaken to help the affected people restore their incomes. The external monitor's survey reports indicate that the affected people's living standards have improved after resettlement.[22] More detailed information on LAR is provided in Appendix 16.

55. **Ethnic minorities development**. The project area included Dali county and Heqing county in Dali Bai autonomous prefecture and Lijiang county-level city. In 2003, about 73% of the 1.10 million people in the project area were ethnic minorities: Bai (46.2%), Naxi (18.3%), Yi (3.2%) and Lisu (2.8%). By 2010, the population had grown to 1.36 million people. The

[20] A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 m^2).
[21] Based on information provided to the PCR mission. Details in Appendix 16.
[22] These reports point to the improved indicators for per capita income; poverty rate and number of poverty villages; renovated and better quality houses; nonfarm income; and access to social services such as health centers, educational institutions, transport facilities, and markets.

boundaries of analysis (BOA)[23] for the project included seven counties: Eryuan, Jianchuan, Lanping, Ninglang, Weixi, Xianggelila (formerly Zhongdian), and Yongsheng. The BOA has another 1.7 million people and 70% are ethnic minorities including Bai (30.7%), Lisu (13.4%), Naxi (3.7%), Pumi (1.7%), Tibetan (4.4), and Yi (13.6%). Based on the high potential for positive or negative and direct or indirect impacts on ethnic minorities in the project area, ADB classified the project as category A for indigenous peoples. An ethnic minorities development plan (EMDP) was prepared to enhance the socioeconomic conditions of ethnic minorities and ensure compliance with the ADB Indigenous Peoples Policy (1998).

56. Analysis of the potential benefits and risks resulted in the mapping of (i) direct benefits to be monitored or enhanced to ensure inclusiveness, (ii) adverse impacts which needed mitigation measures (fully the responsibility of the WYRC), (iii) indirect enhancement measures that local government had committed to implement, and (iv) cultural preservation measures (with grant support from ADB). These potential benefits and impacts formed the basis of the specific activities identified in the EMDP. The EMDP was implemented throughout the project construction phase during 2005–2009.

57. This EMDP was the first one prepared for a railway project in the PRC. Previously, the MOR had collected some data on social and poverty benefits for projects with ADB financing. The ethnic minority requirements for this project provided a new challenge, especially for the WYRC and local government. Overall, implementation of the EMDP was able to meet its goals with respect to the WYRC's project responsibilities. The adverse construction impacts caused by the project were either reduced or adequately mitigated in culturally appropriate ways, especially for land acquisition and resettlement. The project benefits were significant and inclusive of the rural people in the project area and BOA, who are predominantly ethnic minorities. See Appendix 17 for more information on ethnic minorities development during the project.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

58. Overall, the project is rated *successful*. The project formulation and design were technically sound and highly relevant to the government and ADB's development strategies. The main outputs were delivered as planned, and the project railway is being well managed and maintained. The improved railway connectivity has contributed to rapid socioeconomic development and poverty reduction in the project area.

59. The project is economically and financially viable. The financial analysis confirmed that revenues will be sufficient to cover operation and maintenance costs, income taxes, and debt service to ADB and the commercial banks, and provide a reasonable rate of return over the long term. Two of the three financial covenants were achieved ahead of schedule, while the remaining covenant (to maintain an operating ratio of no more than 75%) is likely to be achieved during 2013.

[23] The boundaries of analysis are the neighboring counties to the project area for which a social due diligence study was completed to evaluate any impacts beyond the project area and identify any issues that may arise. This was explicitly requested by ADB Management to address concerns raised by an international Tibetan nongovernment organization.

B. Lessons

60. Having sufficient consultation and participation with stakeholders helps to promote ownership and responsibility. During implementation, a great number of consultation meetings were conducted on the design, construction, safeguards, job opportunities, ethnic minority culture protection, gender, and social impacts. These included hundreds of participants including representatives of local governments, nongovernment organizations, potential customers, ethnic minority groups, and women's federations at town, county, and city levels. Continued extensive consultations during project implementation promoted participants' sense of ownership and responsibility for the project, and helped to further improve the project design.

61. There has been a continuing process of adaptation of the project to the latest construction and operation technology and more environmentally friendly solutions. This has demonstrated that such innovation and reform can improve cost effectiveness, efficiency, safety, and sustainability.

62. The costs of construction materials were underestimated (para. 14). The price for some construction materials, such as cement, steel, stone, and sand increased substantially during project construction. Although there was a price escalation clause in the contracts, price negotiations and contract variations and approval of the variations took considerable time and caused delay in the financial closure of the project.

63. The traffic forecast at appraisal was optimistic regarding the first few years after project completion, particularly for freight traffic. Traffic increase assumptions should be carefully reviewed in future projects.

C. Recommendations

1. Project Related

64. **Financial sustainability.** The WYRC needs to continue to (i) give attention to control of operational costs while improving efficiency; (ii) improve service standards and strengthen its ties with the business sector; and (iii) monitor the project's financial performance, including traffic growth, operating ratio, tariff, and other factors affecting the financial status of the project.

65. **Timing of the project performance evaluation report.** It is recommended that the project performance evaluation report be prepared in 2015 or later, by which time the project will have been in full operation for at least 4 years.

2. General

66. Operation efficiency measures and institutional reform should be key topics for policy dialogue between ADB and the government in the future in order to reduce railway operation costs and improve operation efficiency with a view to contributing to better railway performance and sustainability.

PROJECT FRAMEWORK

Design Summary	Performance Targets/Indicators		Data Sources and Reporting Mechanisms	Assumptions and Risks
	Appraisal	Actual		
Impact Promote sustainable economic growth and reduce poverty in poor northwestern part of Yunnan province	GDP is forecast to increase during 2009–2020 at 4.5% to 5.4% per annum for Yunnan province and 6.6%–7.4% for the project area Per capita rural income will increase from CNY2,202 in 2002 to CNY3,000 in 2013 Rural poverty incidence in the project area will be reduced from 30% in 2003 to 15% in 2015	During 2009–2011, Yunnan's GDP increased from CNY616.8 billion to CNY875.1 billion, at 19.1% per annum. GDP for the project area increased from CNY52.4 billion to CNY74.7 billion, at 19.4% per annum Per capita rural income increased to CNY3,952 in 2010 from CNY2,202 in 2002 Rural poverty incidence in the project area reduced from 30.0% (CNY900) in 2002 to 9.1% (CNY1,274) in 2010	Statistics from Yunnan government offices, Ministry of Railways, and Dali and Lijiang prefectures PPMS at inception and completion	
Outcome Develop an efficient, reliable, and affordable railway transport system to improve access and reduce transport costs in the project area	Rail freight traffic increases from 5.4 million tons in 2010 to 7.2 million tons in 2015 Passenger traffic increases from 3.1 million passengers in 2010 to 4.4 million passenger in 2015 Reduced travel time: (i) Kunming to Lijiang, from present 17 hours to 11 hours; (ii) Dali to Lijiang, reduced from 8 hours to 4 hours Cost of travel reduced from CNY0.38/km to CNY0.27/km Number of tourists traveling on the project railway increased from	Actual freight traffic during 2011 was 2,000 tons and in 2012 70,000 tons, which is expected to increase to 0.97 million tons in 2013 and to 3.92 million tons in 2015. Actual passengers carried was 1.04 million in 2010 and 2.61 million in 2012, which is expected to increase to 2.81 million passengers in 2013 and to 3.26 million passengers in 2015. Travel time reduced: (i) Kunming to Lijiang is reduced from 17 hours to 9 hours, and (ii) from Dali to Lijiang is reduced from 8 hours to 2 hours Cost of travel reduced from CNY0.38/passenger-km by bus to CNY0.22/km by train Number of tourists traveling on the project railway was 0.84 million in 2010 and 2.08 million	WYRC statistics and performance report PCR and WYRC statistics Project progress reports BTOR of project review missions Local government statistics Progress reports Project	**Assumptions** Forecast economic growth rates are realistic and achievable. Traffic forecasts for the DLR are realized. Passengers envisaged will divert to DLR from other transport modes. Local government implements tourism as part of local economic development

Design Summary	Performance Targets/Indicators		Data Sources and Reporting Mechanisms	Assumptions and Risks
	Appraisal	Actual		
	2.4 million in 2010 to 3.3 million in 2015	in 2012, and is expected to increase to 2.58 million in 2015	administration missions and PCR Post-evaluation surveys	
Outputs				
1. Dali–Lijiang railway line, including stations and access roads, constructed	167 km of railway line and 11 new stations constructed; equipment procured and installed for train operations by December 2011	167 km of railway line and 10 stations constructed, and equipment procured and installed by August 2009. The remaining station was completed in 2011.	Project administration missions and PCR	**Assumption** Implementation capacity and technical capability of the WYRC and the Design Institute are strengthened
2. Employment opportunities generated for poor and vulnerable groups to raise incomes and living standards and reduce poverty	96,800 person-years of construction-related employment created; of which 50% of the unskilled labor is captured by the poor	87,687 person-years of construction-related employment created; 35,952 person-years of unskilled labor employed, of which, 19,773 person-years (55%) from local labor poor, minority groups, and women	Project progress reports and PCR mission Monitoring reports from WYRC	**Risk** Capacity enhancement on connecting railway lines may not be completed on time
3. Institutional capacity of WYRC strengthened	Effective marketing program to attract tourism and new industry along the DLR developed by June 2011	Marketing development plans were developed by 2008 On-the-job trainings with 3,748 participants were conducted in 2009–2012	WYRC's reports	

Activities with Milestones

1. Dali–Lijiang railway line, including stations and access roads, constructed
   - 1.1 Technical design completed by October 2004
   - 1.2 Civil works contracts awarded by December 2006.
   - 1.3 Materials and equipment procured by February 2008
   - 1.4 Communications, signaling, and power completed by August 2009
   - 1.5 Railway stations and associated facilities constructed by September 2009

2. Employment opportunities generated for poor and vulnerable groups to raise incomes and living standards and reduce poverty
   - 2.1 Resettlement activities completed by July 2009
   - 2.2 Employment opportunities for the poor generated

3. Institutional capacity of WYRC strengthened
   - 3.1 Marketing system including research for marketing and business development developed by 2008

Inputs

ADB: $179.99 million, of which:

$124.93 million for civil works

$6.91 million for equipment

$48.15 million for materials

AFD: $39.23 million for civil works

MOR/YPG: $581.43 million

AFD = Agence Française de Développement, ADB = Asian Development Bank, BTOR = back to office report, DLR = Dali–Lijiang Railway, GDP = gross domestic product, km = kilometer, MOR = Ministry of Railways, PCR = project completion report, PPMS = project performance management system, WYRC = West Yunnan Railway Company, YPG = Yunnan provincial government.

Source: Asian Development Bank and Ministry of Railways.

UPDATED PROJECT COST AND FINANCING PLAN

Table A2.1: Project Costs

($ million)

Item	At Appraisal							At Completion						
	Cost	ADB	% of Cost	AFD	% of Cost	MOR/ Yunnan Province	% of Cost	Cost	ADB	% of Cost	AFD	% of Cost	MOR/ Yunnan Province	% of Cost
A. Base Cost														
1. Civil Works[a]	356.20	87.10	24.00	38.00	11.00	231.10	65.00	476.29	124.93	25.43	39.23	7.99	312.13	66.59
2. Railway Trackwork[b]	64.10	54.70	85.00	0.00	0.00	9.40	15.00	75.24	48.15	80.69	0.00	0.00	27.09	19.31
3. Buildings and Facilities	8.50	0.00	0.00	0.00	0.00	8.50	100.00	11.21	0.00	0.00	0.00	0.00	11.21	100.00
4. Signaling and Communications	12.70	4.70	37.00	0.00	0.00	8.00	63.00	16.69	2.16	12.95	0.00	0.00	14.53	87.05
5. Electric Power	7.70	4.40	57.00	0.00	0.00	3.30	43.00	8.89	4.75	53.44	0.00	0.00	4.14	46.56
6. Vehicles	10.00	10.00	100.00	0.00	0.00	0.00	0.00	7.71	0.00	0.00	0.00	0.00	7.71	100.00
7. Safety Component	10.10	7.30	72.00	0.00	0.00	2.80	28.00	11.23	0.00	0.00	0.00	0.00	11.23	100.00
8. E-governance and MIS	1.50	1.00	67.00	0.00	0.00	0.50	33.00	2.97	0.00	0.00	0.00	0.00	2.97	100.00
9. Land Acquisition and Resettlement	17.10	0.00	0.00	0.00	0.00	17.10	100.00	37.02	0.00	0.00	0.00	0.00	37.02	100.00
10. Environmental Protection, Mitigation, and Monitoring	5.60	0.40	7.00	0.00	0.00	5.20	93.00	41.31	0.00	0.00	0.00	0.00	41.31	100.00
11. Administration, Consulting Services, and Miscellaneous	19.00	0.40	2.00	0.00	0.00	18.60	98.00	95.04	0.00	0.00	0.00	0.00	95.04	100.00
Subtotal (A)	**512.50**	**170.00**	**33.00**	**38.00**	**7.00**	**304.50**	**59.00**	**783.60**	**179.99**	**24.45**	**39.23**	**5.33**	**564.38**	**70.22**
B. Contingencies														
1. Physical Contingencies[c]	15.70	8.70	55.00	1.30	8.00	5.70	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Price Contingencies[d]	3.60	1.30	36.00	0.70	19.00	1.60	44.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal (B)	**19.30**	**10.00**	**52.00**	**2.00**	**10.00**	**7.30**	**38.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
C. Interest during Construction and Commitment Charge[e]	16.20	0.00	0.00	0.00	0.00	16.20	100.00	17.05	0.00	0.00	0.00	0.00	17.05	100.00
Total (A+B+C)[e]	**548.00**	**180.00**	**33.00**	**40.00**	**7.00**	**328.00**	**60.00**	**800.65**	**179.99**	**22.48**	**39.23**	**4.90**	**581.43**	**72.62**

ADB = Asian Development Bank, AFD = Agence Française de Développement, MOR = Ministry of Railways.

[a] Including seven civil works contracts and $15.11 million for track laying and bridge erection works funded by the executing agency.

[b] Including rails, sleepers, ballast, and bridge beams.

[c] Physical contingency is estimated at 8.0% of base cost on average.

[d] 2.7% per annum for 2005 and 3.0% thereafter on local costs. Zero percent per annum for 2005 and thereafter on foreign exchange.

[d] Import taxes and duties are waived under this project.

[e] The entire 1% front-end fee on all new public sector loans approved during 1 January 2004–30 June 2005 has been waived.

Source: Asian Development Bank and West Yunnan Railway Company.

Table A2.2: Financing Plan
($ million)

Cost	At Appraisal	At Completion
Asian Development Bank	180.00	179.99
Agence Française de Développement	40.00	39.23
Government	328.00	581.43
Total	**548.00**	**800.65**

Source: Asian Development Bank, West Yunnan Railway Company, and Ministry of Railways.

PROJECTED AND ACTUAL CONTRACT AWARDS AND DISBURSEMENTS
($ million)

Table A3.1: Contract Awards Schedule

Year	By Year		Cumulative	
	Projected	Actual	Projected	Actual
2005	15.00	109.82	15.00	109.82
2006	20.00	35.44	35.00	145.26
2007	35.00	27.82	70.00	173.08
2008	6.00	6.90	76.00	179.99
2009	0.80	0.00	76.80	
2010	99.34	0.00	176.14	
2011	3.86	0.00	180.00	
2012	0.00	0.00		

Source: Loan Financial Information System of the Asian Development Bank (2005–2009) and eOperations System (2010–2012).

Table A3.2: Disbursement Schedule

Year	By Year		Cumulative	
	Projected	Actual	Projected	Actual
2005	0.00	6.37	0.00	6.37
2006	35.00	28.65	35.00	35.02
2007	40.00	4.26	75.00	39.28
2008	30.00	68.59	105.00	107.87
2009	25.00	26.12	130.00	133.99
2010	35.29	31.29	166.29	165.28
2011	14.71	11.22	180.00	176.50
2012	0.00	3.48		179.99

Source: Loan Financial Information System of the Asian Development Bank (2005–2009) and eOperations System (2010–2012).

Figure A3.1: Projected and Actual Contract Awards
($ million)

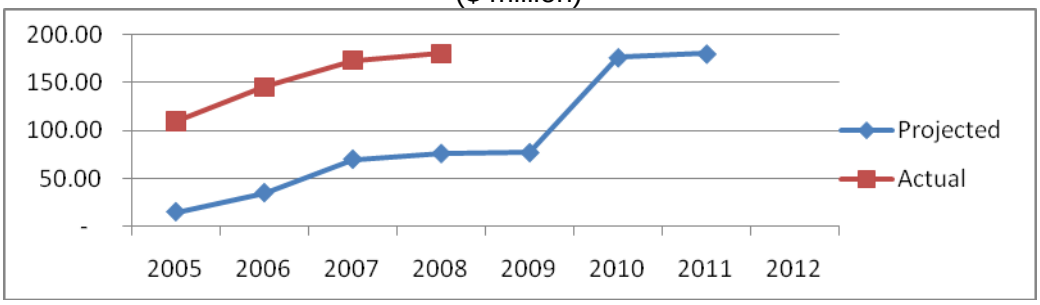
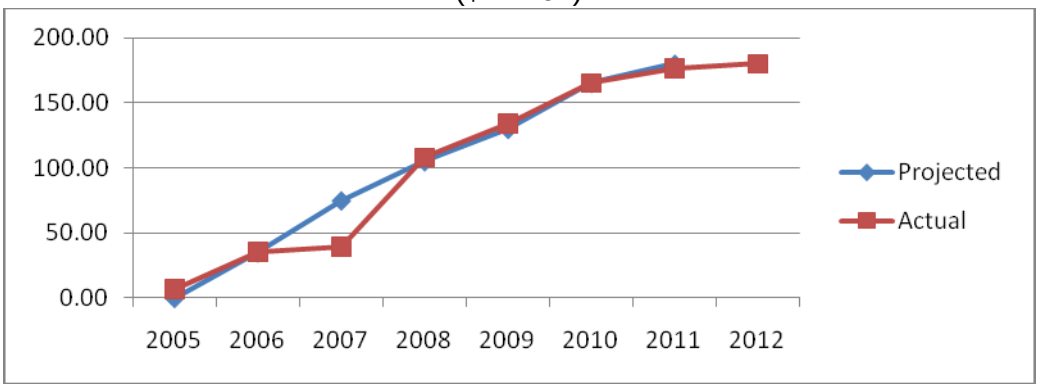


Figure A3.2: Projected and Actual Disbursement
($ million)



CHRONOLOGY OF MAJOR EVENTS

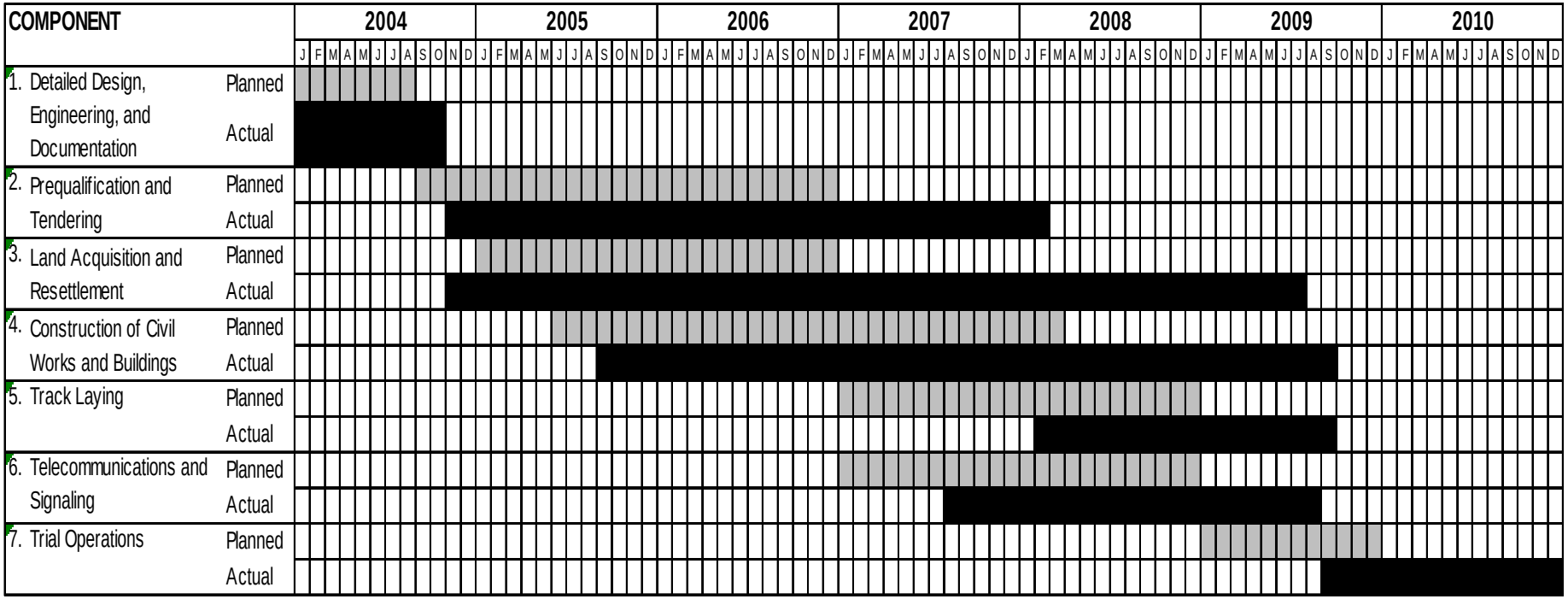
Date		Events
2004	11–23 Mar	Loan fact-finding mission fielded
	15 Jun	First Management review meeting held and advance procurement action approved (for civil works up to bid evaluation)
	6 Sep	General procurement notice published on ADB website
	23 Sep	Second Management review meeting held
	18–20 Oct	Loan negotiations held at ADB headquarters
	11 Nov	Board circulation
	18 Nov	IFB and draft prequalification bidding documents for seven lots of civil works received by ADB
	Nov	Commencement of land acquisition and resettlement activities
	2 Dec	Board consideration and loan approval
	3 Dec	Draft prequalification bid documents for seven lots of civil works approved by ADB, and invitation for bids for prequalification published on ADB website
2005	4 Feb	Draft bidding documents for seven lots of civil works received by ADB
	8 Mar	Prequalification evaluation report for seven lots of civil works received by ADB
	29 Mar	Revised draft bidding documents for seven lots of civil works approved by ADB
	13 Apr	Prequalification of 32 civil works contractors for seven lots of civil works approved by ADB
	13 Apr	Revised draft bidding documents for seven lots of civil works approved by AFD
	18 Apr	Bidding documents for seven lots of civil works issued to prequalified bidders
	21 Apr	Loan agreement between Government of the PRC and AFD signed
	Jun	Commencement of civil works construction under government financing
	17 Jun	Bid opening for the seven lots of civil works
	27 Jun	Loan agreement between Government of the PRC and ADB signed
	7 Jul	BER for seven lots of civil works received by ADB
	18 Jul	Cofinancing agreement between ADB and AFD signed
	4 Aug	BER for seven lots of civil works approved by ADB
	16 Aug	Request for no-objection on notification of award for the seven lots of civil works received and approved by ADB
	27 Oct	Draft prequalification document for the last civil works package received by ADB
	9 Nov	IFB for the last civil works package published on ADB website
	10 Nov	Draft prequalification document for the last civil works package approved by ADB
	14 Nov	Loan declared effective
	22 Nov	Seven signed contracts for civil works received by ADB
	25 Nov	Invitation for prequalification for the last contract under civil works published in *China Daily*
	28 Nov	Prequalification bidding documents for the last contract under civil works issued to interested bidders
	5 Dec	Draft IFB and bidding documents for four lots of materials received by ADB
	13 Dec	First disbursement
2006	4 Jan	Revised IFB and bidding documents for four lots of materials received by ADB
	9 Jan	Bidding documents for the four lots of materials approved by ADB
	9 Jan	IFB for the four lots of materials published on ADB website
	14 Jan	Bidding documents for the four lots of materials issued to potential bidders
	23 Mar	BER for the four lots of materials received by ADB
	12 Apr	BER for the four lots of materials approved by ADB
	28 Apr	Prequalification evaluation report for the last civil works package received by ADB
	2 May	Four signed contracts for materials received by ADB
	9 May	No-objection fax sent to MOR to prequalify five contractors for the last civil works package
	20 Jul	Draft IFB and bidding documents for three lots of material received by ADB
	3 Aug	Bidding documents for the last civil works package received by ADB
	7 Aug	IFB and bidding documents for three lots of material approved by ADB and published on ADB website

Date		Events
	15 Aug	IFB for three lots of material published in *China Daily* and bidding documents issued to potential bidders
	15 Aug	Bidding documents for the last civil works package approved by ADB
	31 Aug	Bidding documents for the last civil works package issued to interested bidders
	27 Oct	Request for rebidding for Lot 1 material because of change in technical specifications received by ADB
	14 Nov	BER for two lots of materials received by ADB
	24 Nov	BER for two lots of materials approved by ADB
	15 Nov	BER for the last civil works package received by ADB
	6 Dec	Rebidding for the last material package issued in *China Daily*
	19 Dec	BER for the last civil works package approved by ADB
2007	3 Jan	Signed last civil works contract received by ADB
	12 Mar	First reallocation of loan proceeds received by ADB
	26 Mar	First reallocation of loan proceeds approved
	16 May	Draft IFB and bidding documents for the 12 lots of equipment received by ADB
	18 May	BER for Lot 1 material received by ADB
	30 May	IFB for the 12 lots of equipment published on ADB website
	7 Jun	Bidding documents for the 12 lots of equipment approved by ADB
	27 Jun	IFB for the 12 lots of equipment published in *China Daily*
	4 Jul	BER for Lot 1 material approved by ADB
	31 Jul	Signed contract for Lot 1 received by ADB
	27 Dec	BER for the 12 lots of equipment received by ADB
2008	Feb	Commencement of track laying and girder erection works
	15 Feb	BER for the 12 lots of equipment approved by ADB
	27 Mar	12 signed contracts for equipment received by ADB
	17 Jul	Second reallocation of loan proceeds approved
2009	Jul	Land acquisition and resettlement activities completed
	Sep	Track laying and girder erection works completed
	28 Sep	Commencement of trial operations
2010	25 Jun	Loan closing date extension approved
	30 Jun	Original loan closing date
	Jul–Sep	Preliminary acceptance inspection carried out by the MOR and Kunming Railway Administration Bureau
	31 Dec	Trial operations completed
2011	1 Jan	Commencement of commercial operations
	15 Nov	Third reallocation of loan proceeds approved
	31 Dec	Revised loan closing date
2012	15 Jun	Final disbursement
	9 Jul	Actual loan closing date

ADB = Asian Development Bank, AFD = Agence Française de Développement, BER = bid evaluation report, IFB = invitation for bids, MOR = Ministry of Railways, PRC = People's Republic of China.

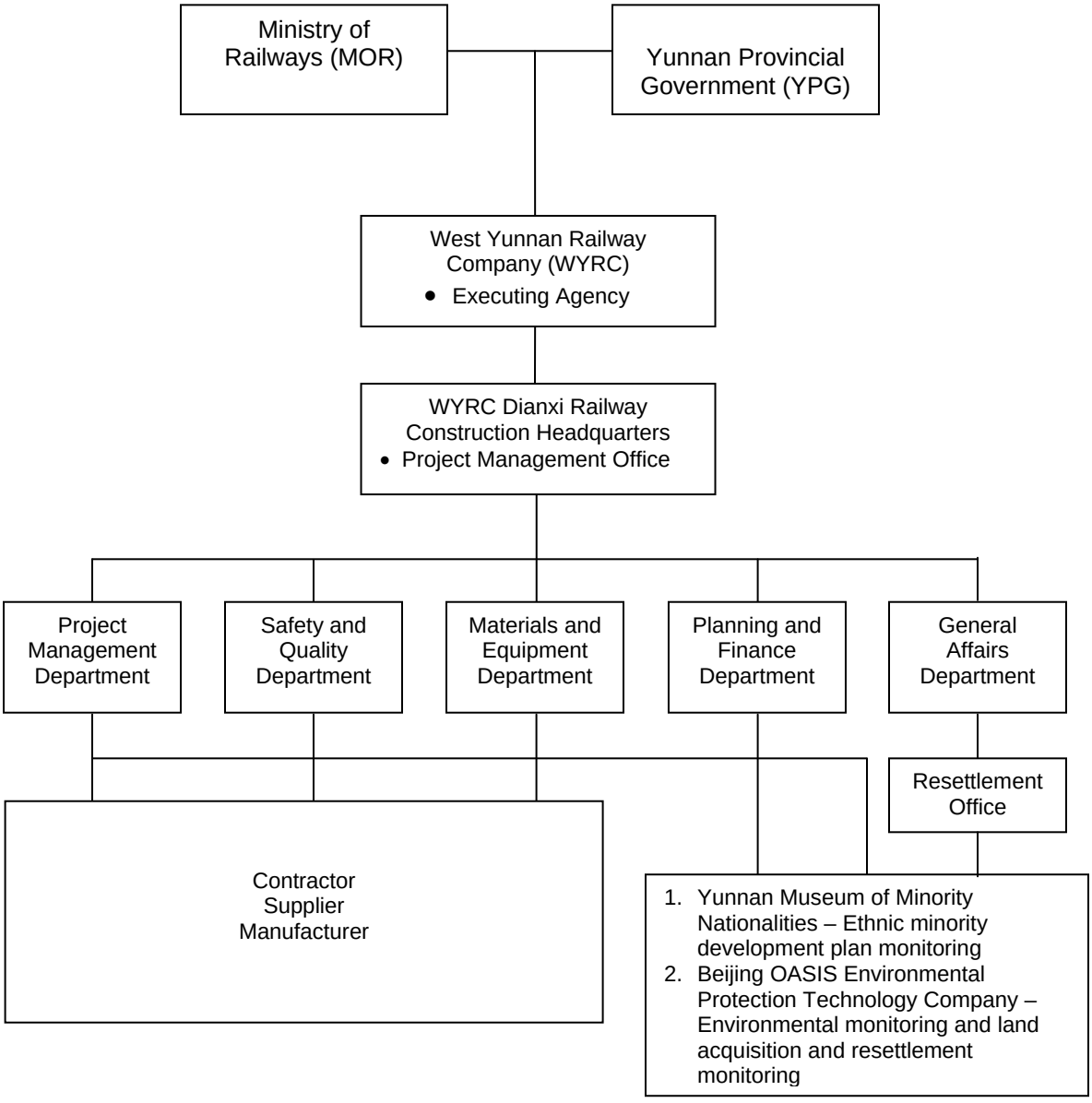
Sources: Asian Development Bank, Dianxi Railway Construction Headquarters, Ministry of Railways, and West Yunnan Railway Company.

APPRAISAL AND ACTUAL IMPLEMENTATION SCHEDULE



Source: West Yunnan Railway Company and Dianxi Railway Construction Headquarters.

ORGANIZATION CHART



STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference	Status of Compliance
1. **Project Executing Agency.** West Yunnan Railway Company (WYRC) shall be the Project Executing Agency, responsible for overall implementation of the Project, setting up of the on-site Construction Management Units along the route of the Project Railway and reporting to ADB. .	LA, Schedule 6, para. 1	Complied with. The project was implemented satisfactorily and in a timely manner. No quality concerns were identified.
2. **Role of Foreign Capital and Technical Import Center (FCTIC) under the Ministry of Railways.** FCTIC shall coordinate the project management activities, supervise procurement of the goods and services financed under the Project, and review the reports submitted to ADB.	LA, Schedule 6, para. 2	Complied with. FCTIC coordinated the project management activities, supervised and provided guidance on procurement under the project, and reviewed the reports submitted to ADB.
3. **Construction Quality.** WYRC shall ensure that the Project Railway is constructed in accordance with the Borrower's national technical standards, and that construction supervision, quality control and contract management are carried out in a satisfactory manner.	PA, Schedule, para. 2	Complied with. The project passed MOR's inspection on construction quality and transportation safety assessment before trial operations started.
4. **Connecting Railway Lines.** The Borrower shall cause MOR and WYRC to ensure that (i) the capacity enhancement operations for the connecting railway lines are completed by commencement of the commercial operations of the Project Railway, and (ii) necessary measures are promptly taken to minimize any capacity constraint on such connecting railway lines, once identified during the operation of the Project Railway, in order to ensure smooth flow of the traffic generated by the Project Railway.	LA, Schedule 6, para. 3	Complied with. The capacity enhancement project on introduction of the centralized traffic control between Guangtong and Dali was completed in 2009; the capacity enhancement works in Dali East station to increase 10 more tracks was completed in 2010. Market development plan was carried out to ensure smooth flow of traffic generated by the project railway.
5. **Industrial Sidings.** WYRC shall ensure that potential major shippers along the Project Railway are encouraged and assisted as necessary to construct and operate industrial sidings for cargo shipment.	PA, Schedule, para. 4	Complied with. MOR and WYRC have been making efforts to link the railway to larger-volume railway customers, improve transport efficiency and service quality, and establish partnership with business entities. Six industrial sidings are expected to be constructed, three of which are scheduled for construction in 2013.
6. **Station Access Roads.** The Borrower shall cause the local governments at the prefecture, city and county levels to (i) construct the station access roads in a timely manner prior to the commencement of commercial operations of the Project Railway, (ii) apply ADB's Policy on Involuntary Resettlement (1995) and Policy on Indigenous Peoples (2003) in construction of	LA, Schedule 6, para. 4	Complied with. Construction of 139 km of access roads and 11 station connecting roads (to the railway station) with a total length of 29.9 km were completed in September 2009.

Covenant	Reference	Status of Compliance
such roads, and (iii) carry out any land acquisition and resettlement activity in accordance with the Resettlement Plan, as set out therein.		
7. **Container Traffic.** For effective utilization of the Project Railway, the Borrower shall cause (i) MOR to construct an extra-large container terminal in Kunming by commencement of the commercial operations of the Project Railway, and (ii) WYRC to develop the necessary marketing services to induce and channel container traffic to the Project Railway.	LA, Schedule 6, para. 5	Complied with. The Kunming Railway Container Terminal has been in operation since 2008. Facilities to handle containers are also being constructed at the Lijiang East railway station. A marketing development program was prepared in 2008, and has been implemented since 2009. As a result of implementation of the program, several services agreements with potential major clients were reached, which are expected to attract 4.7 million–8.4 million tons of freight traffic annually to the project during 2015–2019.
8. **Tariffs (a).** The Borrower shall ensure that MOR and WYRC set the passenger and freight tariffs, respectively, with respect to the Project Railway, at rates sufficient to ensure compliance with financial covenants stipulated in the Project Agreement, paragraph 9 of the Schedule, and full cost recovery including the management cost of WYRC and the working (operation and maintenance) costs of the Project Railway, depreciation, debt service, taxes and a reasonable profit.	LA, Schedule 6, para. 6	Complied with. WYRC, in consultation with MOR, carried out a tariff study and set the tariffs at rates sufficient to ensure full cost recovery. Tariffs were revised in 2009 and the average freight tariff increased to CNY0.35/ton-km. Debt service coverage and debt–equity ratio covenants have been achieved in advance of the schedule. The operating ratio covenant will likely be achieved as traffic increases.
9. **Tariffs (b).** The Borrower shall also ensure that WYRC, in consultation with MOR, (i) carries out a tariff study six months prior to the trial operation of the Project Railway and advises ADB of the tariffs applied during such trial operation, and (ii) reviews and updates such tariffs annually to ensure full cost recovery.	LA, Schedule 6, para. 6	Complied with. A tariff study was carried out, and ADB was advised of the tariff applied.
10. **Supply of Rolling Stock.** WYRC shall ensure provision of sufficient rolling stock, at all times, for effective operation of the Project Railway.	PA Schedule, para. 6	Complied with. Sufficient rolling stock has been provided.
11. **Passenger and Freight Safety.** WYRC shall ensure the safety of passengers and freight on the Project Railway in accordance with the relevant laws and regulations of the Borrower.	PA Schedule, para. 7	Complied with. Safety of passengers and freight is the top priority of WYRC. There have been no records of incidents or accidents since operations began.
12. **Cofinancing (a).** In the event that a loan from Agence Francaise de Developpement (AFD) is not made available to the Borrower for co-financing of the Project, the Borrower shall, by the time of the first disbursement of the Loan	LA, Schedule 6, para. 7	Not applicable. Cofinancing agreement between the Government of the PRC and AFD was signed on 21 April 2005.

Covenant	Reference	Status of Compliance
proceeds, make other timely arrangements satisfactory to ADB to commit the additional funds intended to be provided by AFD.		
13. **Cofinancing (b).** In the event that the AFD loan is suspended, accelerated or terminated prior to its agreed maturity date, the Borrower shall promptly take the necessary measures to make funds available for the Project expenditures that would have originally been financed through the AFD loan.	LA, Schedule 6, para. 7	Not applicable. AFD loan was fully utilized.
14. **Reform Measures.** The Borrower shall take necessary measures to continue to implement its national Railway Development Plan (2004) including (i) separation of the core railway operations from non-core transportation business operations in three large specialized railway companies, (ii) rationalization of staff, and (iii) causing WYRC to outsource some of the activities that have been so far handled by WYRC.	LA, Schedule 6, para. 8	Complied with. The three large specialized companies were separated in 2003. WYRC outsourced the provision of loading and unloading in freight yards, and cleaning and food services on trains. The 2004 National Railway Development Plan is being implemented.
15. **Safety Dissemination.** WYRC shall, in cooperation with the local governments at the prefecture, city and county levels, formulate and implement appropriate public safety campaigns through media, public announcements, household contacts and schools to familiarize people living along the Project Railway route with safety issues related to railways.	PA Schedule, para. 8	Complied with. Public safety campaigns have been conducted through newspapers, the local media, and visits to households and schools.
16. **Audit Accounts.** WYRC shall also (i) establish and maintain an internal audit unit, the composition and the terms of reference of which shall be acceptable to ADB, to undertake timely audit of project accounts in accordance with generally accepted accounting principles; and (ii) submit to ADB its audited accounts and financial statements during construction and in the first five years of commercial operations of the Project Railway within nine months of the end of each relevant fiscal year.	PA Schedule, para. 8	Complied with. Audit reports were submitted to ADB on time. A total of six audit reports were received for the years 2006–2011.
17. **Financial Ratios.** WYRC shall maintain, starting from the 3rd fiscal year of commencement of the commercial operations of the Project Railway: (i) operating ratio of not more than 75%; (ii) DSCR of at least 1.2; and (iii) debt to equity ratio of not more than 60:40.	PA Schedule, para. 9	Due in 2013. Two are already complied with. The operating ratio of not more than 75% is expected to be achieved in 2013.
18. **Anticorruption Measures.** The Borrower shall cause MOR to ensure that (i) a supervisory body is established for prevention of undue interference in business practices and adequate resources are made available for its effective operation, (ii) a leading group of officials from the Discipline Unit and Supervision Department of the MOR are located in offices involved in the bidding, construction and other operational activities under the Project, and (iii) briefings between MOR and Prosecutor's Office are held	LA Schedule 6, para. 9	Complied with. Supervision body established. A leading group for anticorruption formed. Anticorruption measures were included in the regulations and contracts between suppliers and the executing agency. Briefings were periodically carried out.

Covenant	Reference	Status of Compliance
on a regular basis with respect to sharing of information on or warning about detected corrupt practices.		
19. **Environmental Measures.** The Borrower shall cause MOR, YPG and WYRC to ensure that (i) the Project is designed, constructed, operated and maintained in accordance with the environmental laws and regulations of the Borrower and the Environmental Policy (2002) of ADB, (ii) the Environmental Management and Monitoring Program (EMMP) and the mitigation measures included therein, as specified in the detailed Environmental Management Plan and the Environmental Impact Assessment prepared for the Project, are properly implemented, (iii) any environmental permits, licenses and clearances are obtained in a timely manner, (iv) any adverse impact on the environment that may arise from the Project implementation activities is promptly mitigated or minimized in accordance with the EMMP, and (v) implementation of the EMMP, including any safety breaches, violation of environmental standards and corrective measures taken thereto, is reported semi-annually to ADB.	LA Schedule 6, para. 10	Complied with. MOR, YPG, WYRC, and DRCH engaged a domestic consulting firm—Beijing Oasis Environment Protection Technology Company—that acted as the external monitoring agency for environment. The nine semi-annual EMRs, the findings of ADB review missions, and the PCR mission indicate that environmental mitigation and monitoring measures were implemented satisfactorily in accordance with ADB and domestic EIA requirements and were effective in avoiding adverse environmental impacts. Issues identified, complaints received, and their satisfactory resolution were documented in the EMRs.
20. **Outsourcing.** WYRC shall take necessary measures, in accordance with the Railway Development Plan (2004) of the Borrower, to outsource some of the activities, such as construction works, track and power cable maintenance, and industrial sidings.	PA Schedule, para. 11	Complied with. Loading and unloading functions at Dali and Lijiang freight stations have been outsourced to Fengzhuang and Penggui companies. Catering on passenger trains and track maintenance is performed by staff of the Kunming Railway Bureau.
21. **Land Acquisition and Resettlement.** The Borrower shall cause MOR, YPG and WYRC to ensure that (i) the Resettlement Plan is carried out promptly and efficiently in accordance with its terms, all applicable laws and regulations of the Borrower, and ADB's Policy on Involuntary Resettlement, (ii) all affected people are given adequate opportunity to participate in resettlement planning and implementation, particularly in entitlements and income restoration measures as set out in the Resettlement Plan, (iii) affected people are compensated and assisted, in accordance with the Resettlement Plan, prior to displacement from their houses, land and assets such that they will be at least as well of as they would have been in the absence of the Project, and (iv) civil works contractors employed under the Project comply with the requirements of the Resettlement Plan, the applicable laws and regulations of the Borrower and ADB's Policy on Involuntary	LA Schedule 6, para. 11	Complied with. The resettlement plan covered all aspects of compensation, consultation and participation, and employment opportunities and has been carried out satisfactorily.

Covenant	Reference	Status of Compliance
Resettlement, to the extent applicable to such contractors.		
22. **Land Acquisition and Resettlement.** The Borrower shall cause MOR and YPG to ensure that (i) funds needed for land acquisition and resettlement, including those for cost overruns, are allocated and disbursed in a timely manner, (ii) the Resettlement Plan is updated and submitted to ADB within three months of completing the detailed measurement surveys, and (iii) ADB is promptly advised of any substantial changes in the resettlement impacts and, if necessary, a revised resettlement plan is submitted to ADB for concurrence.	LA Schedule 6, para. 12	Complied with. Funds for land acquisition and resettlement were allocated and disbursed in a timely manner.
23. **Land Acquisition and Resettlement.** The Borrower shall also ensure that (i) MOR, YPG and WYRC effectively supervise the Resettlement Program, (ii) the Land Acquisition and Resettlement (LAR) Division of WYRC and the LAR Offices and Land Administration Bureaus (LABs) at the prefecture and county levels are responsible for implementing and delegating resettlement activities to those township officials and village committees affected by the Project, (iii) the LAR Offices at the county level sign agreements with affected villages and individuals, and disburse the compensation, and (iv) village committees assist in the implementation of land acquisition and resettlement with guidance from township officials.	LA Schedule 6, para. 13	Complied with. MOR, YPG, and WYRC effectively supervised the resettlement program. Implementation and disbursement by all divisions and units at prefecture, county, and town levels was handled promptly and efficiently.
24. **Land Acquisition and Resettlement.** The Borrower shall cause MOR, YPG and WYRC to ensure that (i) all affected people are provided with adequate information and regularly consulted in advance of signing household compensation agreements and prior to taking other decisions that affect their livelihoods and living conditions as a result of the Project, and (ii) the LAR Division of WYRC and LAR Offices and LABs at the prefecture and country levels maintain proper records of consultation and grievances, and make such records available to the external monitor or ADB on request.	LA Schedule 6, para. 13	Complied with. The affected persons were adequately informed and consulted before and during the resettlement implementation process. A grievance redress mechanism was set up in accordance with the resettlement plan and dealt with project-related grievances of affected persons.
25. **Land Acquisition and Resettlement.** The Borrower shall cause MOR, YPG and WYRC to encourage affected households to participate in the design and planning of resettlement activities, including the detailed measurement survey, location of underpasses, new housing sites, collective investment of compensation and grievance redress.	PA Schedule, para. 15	Complied with. There was good participation from WYRC, local government, village leaders, and affected persons. Grievances reported were resolved in a timely manner and there are no outstanding issues.
26. The Borrower shall ensure that implementation of the Resettlement Plan is monitored internally and externally in the following manner: (a) WYRC and the LAR offices at the prefecture	PA Schedule, para. 15	Complied with. Internal and external monitoring were carried out efficiently and satisfactorily.

Covenant	Reference	Status of Compliance
and county levels shall be responsible for internal supervision and monitoring of (i) compensation payments, (ii) house rebuilding and relocation of affected people, (iii) land redistribution, and (iv) grievance redress. WYRC shall prepare and submit to ADB quarterly reports on the progress of the implementation of the Resettlement Plan, and a comprehensive report upon its completion.		
(b) An institute or organization, independent of MOR and WYRC, shall be contracted to carry out the external monitoring and evaluation of the Resettlement Plan, including (i) review and verification of the compensation payments, (ii) status of land acquisition and compensation payments, (iii) appraisal of grievance redress procedures, (iv) affected people's reaction to and satisfaction with entitlements and compensation, (v) assessment of the restoration of livelihoods of affected people, and (vi) drawing lessons learned for future resettlement planning. The external monitor shall prepare monitoring and evaluation reports for submission to ADB and MOR every six months until the completion of resettlement activities. Where relevant, data shall be disaggregated by gender and ethnic group. Thereafter, annual investigations shall be conducted for at least two years, or until economic rehabilitation (i.e. restoration of incomes) has been successfully completed, and reported thereon to ADB and MOR.	PA Schedule, para. 16	Complied with. An independent external monitoring agency, Beijing Oasis Environment Protection Technology Company, was recruited and assisted WYRC in monitoring the implementation of the resettlement plan.
27. The Borrower shall cause Dali Prefecture and Lijiang City governments to provide the financial resources for livelihood training of the affected people and additional support for vulnerable groups, as agreed between the Borrower and ADB.	LA Schedule 6, para. 15	Complied with. Livelihood trainings were conducted every year.
28. **Ethnic Minorities Development Plan.** The Borrower shall cause MOR, YPG and WYRC to ensure that (i) adverse impacts on ethnic minorities are avoided or adequately mitigated in a timely manner, (ii) ethnic minorities are provided opportunities to benefit from the economic development generated through the Project in an equitable and sustainable manner, (iii) the EMDP is efficiently implemented in accordance with its terms, all applicable laws and regulations of the Borrower, and ADB's Policy on Indigenous Peoples, (iv) all affected ethnic minorities are adequately consulted and provided with full opportunity to participate in the planning and implementation of mitigation and enhancement measures, (v) sufficient budget is	PA Schedule, para. 17	Complied with. The EMDP was efficiently implemented in accordance with its terms, the relevant laws and regulations of the PRC, and ADB policy. Attached TA was also implemented, which included pilot projects for cultural preservation and development.

Covenant	Reference	Status of Compliance
made available and funds are disbursed in a timely manner for effective implementation of EMDP, and (vi) implementation of EMDP is monitored and evaluated (aa) internally by WYRC and reported to ADB through semi-annual progress reports, and (bb) externally by a local institute or organization independent of MOR and WYRC acceptable to ADB, and reported to ADB through annual evaluation reports and a completion report. Where relevant, data shall be disaggregated by gender and ethnic group.		
29. **Ethnic Minorities Development Plan.** The Borrower shall also cause MOR, YPG and WYRC to ensure that, pursuant to the EMDP, (i) local communities, including ethnic minorities, are appropriately consulted and given adequate participation opportunities in design and planning of the railway stations to be constructed under the Project, (ii) employment opportunities are expanded and appropriate skills development training is provided for the ethnic minorities in the Project Railway corridor, (iii) measures are taken to generate increased tourism along the Project Railway corridor, and (iv) cultural preservation measures set out in the EMDP are effectively supported by the local governments concerned.	PA Schedule, para. 18	Complied with. Measures were taken to protect and enhance cultural diversity and promote culturally sensitive tourism.
30. **Ethnic Minorities Development Plan.** The Borrower shall also ensure that: (a) WYRC establishes Construction Management Units in Dali and Lijiang to be responsible for overall supervision and monitoring of the implementation of the EMDP.	PA Schedule, para. 19	Complied with. Construction management units were established to supervise and monitor the implementation of the EMDP.
31. **Ethnic Minorities Development Plan.** (b) the Project Leading Group established by YPG for railway construction in Yunnan Province, designates a coordination office within each municipality of Dali and Lijiang. These municipal coordination offices shall be responsible for the day-to-day implementation of the EMDP in relevant villages and shall work closely with WYRC to ensure that ethnic minority groups benefit equitably from the Project and that adverse effects are avoided or appropriately mitigated. Vulnerable households shall be given priority as set out in the EMDP.	PA Schedule, para. 19	Complied with. The supervision offices in Dali and Lijiang were very active and have contributed significantly to the successful implementation of this project. Affected households, especially vulnerable persons, were given priority for assistance under the project.
32. **Poverty Reduction.** The Borrower shall ensure that WYRC causes the contractors involved in Project implementation to maximize employment of local poor persons who meet the job and efficiency requirements for construction of the Project Railway. Such workers shall be provided adequate on-the-job training. WYRC, in consultation with the Poverty Alleviation Office of the YPG shall, monitor the Project's impact on poverty with the assistance of the domestic consultants to be recruited under the Project,	PA Schedule, para. 20	Complied with. About 19,773 person-years of unskilled labor were hired from the local market, which prioritized the poor, minority groups, affected persons, and women.

Covenant	Reference	Status of Compliance
based on a set of indicators agreed between the Borrower and ADB, and submit annual monitoring reports to ADB during the Project implementation period.		
33. **Gender and Development.** The Borrower shall cause WYRC to implement the Project in accordance with of ADB's Policy on Gender and Development (1998) and take all necessary actions to encourage women living in the Project area to participate in planning and implementation of the Project. Furthermore, the Borrower shall ensure that MOR and WYRC monitor the effects of the Project on women through collection and compilation of gender-disaggregated data, where relevant, including in the Resettlement Plan, EMDP, and the Project Performance Management System to be established for the Project.	PA Schedule, para. 21	Complied with. The WYRC has encouraged the participation of women. About 10% of the local laborers hired in construction were women. Women were contracted to provide food services to construction camps.
34. **Health Concerns.** The Borrower shall cause WYRC to ensure that (i) contractors involved in Project implementation disseminate information on the risks of socially transmitted infections, including HIV/AIDS, to the workers they employ under the Project and to local communities, through public awareness campaigns, and (ii) that adequate health and treatment facilities are made available nearby. The Borrower shall cause the YPG and WYRC to ensure that similar information is disseminated, in consultation with the Health Bureau in Yunnan, to railway operators during operation of the Project facilities.	PA Schedule, para. 22	Complied with. Information on HIV/AIDS and drug use were disseminated to all new workers as part of the induction training. The local government has a very active HIV/AIDS awareness and prevention campaign in the project area. Adequate health facilities are provided in the construction camps. Local clinics and hospitals are also available and sufficient. The local health bureaus and HIV/AIDS offices (in Dali and Lijiang) will continue their campaign on HIV/AIDS awareness and prevention.
35. **Project Performance Monitoring and Evaluation.** The Borrower shall cause MOR and WYRC to monitor and evaluate Project impact through a Project Performance Monitoring System to be established, as agreed between the Borrower and ADB, to ensure that the Project facilities are managed efficiently, benefits are maximized and social impacts are monitored. The Borrower shall also cause MOR and WYRC to establish baseline and target values for a set of indicators for evaluating Project performance, as agreed between the Borrower and ADB, and measure the Project indicators, and compare to the baseline values, at the inception of Project implementation, at completion of the Project and three years thereafter. Where relevant, indicators shall be disaggregated by gender and ethnic group. Reports summarizing the key findings of	PA Schedule, para. 23	Ongoing. The final project performance monitoring report will be due in 2015.

Covenant	Reference	Status of Compliance
such monitoring shall be submitted to ADB in a timely manner.		
36. Fielding of Consultants. (i) for strengthening marketing and business development functions of WYRC; and (ii) researching and strengthening the development, operation, and management of the joint-venture railway systems in the PRC.	LA Schedule 5	Complied with. National consultants were engaged and financed by the executing agency to strengthen marketing and business development functions of the WYRC, including development, operation, and management skills required for joint-venture railway systems in the PRC.
37. The Borrower shall cause WYRC to (i) maintain separate accounts for the Project implementation period; (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by external auditors whose qualifications, experience and terms of reference are acceptable to ADB; (iii) furnish to ADB, as soon as available but in any event not later than 9 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of this Loan Agreement as well as on the use of the procedures for statement of expenditures, all in English language; and (iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.	LA Schedule 4.05	Complied with. Audit reports have been submitted to ADB in a timely manner. Six audit reports were received covering 2006–2011.

AFD = Agence Francaise de Developpement, ADB = Asian Development Bank, CNY = Yuan, DRCH = Dianxi Railway Construction Headquarters, EMDP = ethnic minority development plan, EMMP = environmental management and monitoring program, EMR = environmental monitoring report, FCTIC = Foreign Capital and Technical Support Center, LAB = land administration bureau, LAR = land acquisition and resettlement, MOR = Ministry of Railways, WYRC = West Yunnan Railway Company, YPG = Yunnan Provincial Government.

LIST OF NATIONAL CONSULTING SERVICE CONTRACTS

Date		Name of Consultant	Type of Service	Contract Amount (CNY million)
2004	10 Sep	Cultural Relics and Archeology Institute of Yunnan Province	Technical service	0.15
	1 Oct	Yunnan Geological Engineering Survey and Design Institute Company	Detailed design	0.35
	4 Nov	National Land and Resource Administration Bureau of Yunnan Province	Survey	0.68
	6 Dec	Forest Inventory and Planning Institute of Yunnan Province and its forest business branch	Detailed design	1.03
	27 Dec	Beijing Oasis Environment Protection Technology Company	External Monitoring Agency for Resettlement and Environment	0.17
	28 Dec	Quality Supervision Center	Construction Supervision	1.99
2005	Jan	Construction Supervision Company of Southwest Jiaotong University	Construction Supervision	0.60
	Jan	Yunnan Railway Project Supervision Company	Construction Supervision	0.80
	Jan	Yunnan Nationality Museum	External Monitoring Agency for Ethnic Minority Development	0.09
	Apr	Railway Survey and Design Institute of Kunming Railway Administration Bureau	Construction Supervision	0.88
	May	The 2nd Railway Survey and Design Institute	Civil work design	81.80
	1 Aug	Beijing Oasis Environment Protection Technology Company	Technical service	0.17
	Sep	Yunnan Nationality Museum	Monitoring	0.07
	26 Oct	Cultural Relics and Archeology Institute of Yunnan Province	Technical service	1.45
2006	Jan	Science and Technology Research Institute of Kunming Railway Administration Bureau	Monitoring	0.80
	Jan	Structural Engineering Test Center of Southwest Jiaotong University	Monitoring	0.60
	1 Aug	Construction Land Use Affairs Center of the National Land and Resource Administration Bureau of Yunnan Province	Survey	0.35
	11 Aug	Forest Inventory and Planning Institute of Yunnan Province and its forest business branch	Detailed design	0.54
	Sep	Yunnan Rundian Water-Saving Technology Promotion and Consolations Company	Technical service	0.77
	Sep	Structural Engineering Test Center of Southwest Jiaotong University	Technical service	0.30
	Sep	Kunming Southern Geotechnical Engineering Technology Development Company	Technical service	0.48
	30 Dec	The 2nd Railway Survey and Design Institute	Technical service	0.28
2008	1 Jan	Forest Inventory and Planning Institute of Yunnan Province and its forest business branch	Detailed design	0.69
	8 May	Engineering Company of the 2nd Railway Survey and Design Institute of China	Detailed design	0.85
	17 Dec	Beijing Oasis Environment Protection Technology Company	Technical service	0.15
	17 Dec	Beijing Oasis Environmental Protection Technology Company	External Monitoring Agency for Resettlement and Environment	0.15
2009	Mar	Yunnan Railway Project Supervision Company	Construction Supervision	2.94
		Total		**98.90**

Source: West Yunnan Railway Company.

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Contract No.	PCSS No.	Contract Description	Procurement Mode	Date Approved	Contract Date	Contractor/Supplier	Currency	Final Contract Cost	ADB Financing $ Equivalent
A. Civil Works									
DLZJ-05W01	0001	W1–11.314 km (K194+500~K205+813.6)	ICB	4-Aug-05	15-Nov-05	Xinjiang Production and Construction Corporation	CNY	50,599,999	7,270,264
DLZJ-05W02	0002	W2–18.42 km (DK2+060.2~DK16+420)	ICB	4-Aug-05	15-Nov-05	Railway 19 Bureau Group Corporation	CNY	114,197,423	15,864,020
DLZJ-05W04	0003	W4–16.567 km (DK34+600~DK51+600)	ICB	4-Aug-05	15-Nov-05	Railway 18th Bureau (Group) Corporation	CNY	99,373,457	13,977,909
DLZJ-05W06	0004	W6–7.721 km (DK61+850~DK69+500)	ICB	4-Aug-05	15-Nov-05	Railway Group Limited	CNY	66,159,081	9,307,017
DLZJ-05W08	0005	W8–24.683 km (DK80+500~DK105+500)	ICB	4-Aug-05	15-Nov-05	China Railway Eighth Civil Engineering Group	CNY	162,999,999	22,835,665
DLZJ-05W09	0006	W9–33.265 km (DK105+500~DK139+300)	ICB	4-Aug-05	15-Nov-05	Joint Venture of China Railway Shisiju Group Corp. and Yunnan Railways Corp.	CNY	138,947,515	18,981,481
DLZJ-05W10	0007	W10–26.629 km (DK139+300~DK165+925)	ICB	4-Aug-05	15-Nov-05	China Tiesiju Civil Engineering Group Company	CNY	158,262,448	21,585,019
DLZJ-06W11	0014	W11–Track laying and girder W1–erection works	ICB	19-Dec-06	25-Apr-06	China Railway Erju Company	CNY	102,738,478	15,110,858
		Subtotal A						**893,278,400**	**124,932,233**
B. Equipment									
08CN01GTF1 IWS0001	0016	Intelligent power supply panel	ICB	15-Feb-08	26-Feb-08	Rail Force Engineering	CNY	1,349,599	199,255
08CN01GTF1 IWS0002	0017	Computer interlocking equipment	ICB	15-Feb-08	26-Feb-08	Casco Signal	CNY	5,128,610	753,988
08CN01GTF1 IWS0003	0018	Computer monitoring system equipment	ICB	15-Feb-08	26-Feb-08	Casco Signal	CNY	2,258,540	332,042
08CN01GTF1 IWS0004	0019	Section axle-counting and inspecting equipment	ICB	15-Feb-08	26-Feb-08	CCECC International Trading Company	CNY	1,380,600	202,809
08CN01GTF1 IWS0005	0020	Trunk transmission, access network, and program control exchange equipment	ICB	15-Feb-08	26-Feb-08	Beijing Broadcosting and Telecom Tech. Company	CNY	3,181,852	468,059
08CN01GTF1 IWS0006	0021	Digital dispatching system equipment	ICB	15-Feb-08	26-Feb-08	China National Software and Service Company	CNY	737,748	108,387
08CN01GTF1 IWS0007	0022	Optical fiber online monitoring system equipment	ICB	15-Feb-08	26-Feb-08	Beijing Century Real Technology Company	US$	89,825	89,825
08CN01GTF1	0023	High frequency switch	ICB	15-Feb-08	26-Feb-08	Beijing Century Real	US$	69,208	69,208

Contract No.	PCSS No.	Contract Description	Procurement Mode	Date Approved	Contract Date	Contractor/Supplier	Currency	Final Contract Cost	ADB Financing $ Equivalent
IWS0008		power supply device and storage battery				Technology Company			
08CN01GTF1 IWS0009	0024	Transformer	ICB	15-Feb-08	26-Feb-08	China National Electric Import and Export Corp.	CNY	1,458,034	224,103
08CN01GTF1 IWS0010	0025	Transformer/distribution substation	ICB	15-Feb-08	26-Feb-08	World Tender Industrial	CNY	4,624,313	681,916
08CN01GTF1 IWS0011	0026	Integrated automatic control system of computers and electric power remote control system	ICB	15-Feb-08	26-Feb-08	JV of Chengdu Sysware Electronic Information Company and Integrated Electronic Systems Lab	CNY	3,945,302	579,502
08CN01GTF1 IWS0012	0027	Steel-cored aluminum strand and power cable	ICB	15-Feb-08	26-Feb-08	Shandong Machinery I&E Group Corporation	CNY	21,724,301	3,193,215
		Subtotal B							**6,902,309**
C. Materials									
06N01GTF1I WS0009	0008	Lot A1: Prestressed concrete beam (449 spans + 36 pcs.)	ICB	12-Apr-06	25-Apr-06	China National Electric Import and Export Corporation	CNY	66,282,750	9,436,754
06N01GTF1I WS0010	0009	Lot A2: Prestressed concrete beam (397 spans + 4 pcs.)	ICB	12-Apr-06	25-Apr-06	Hubei Machinery and Equipment Import and Export Yangmahe Engineering Company	CNY	70,593,839	10,215,749
06N01GTF1I WS0011	0010	Lot B1: YZM steel bearing (1,976 pcs.)	ICB	12-Apr-06	25-Apr-06	CITIC International Cooperation Company	CNY	9,718,840	1,406,650
06N01GTF1I WS0012	0011	Lot B2: YZM steel bearing (1,588 pcs.)	ICB	12-Apr-06	25-Apr-06	CITIC International Cooperation Company	CNY	9,388,880	1,381,478
06N01GTF1I WS0017	0012	Rail materials: Turnout and turnout sleeper (136 groups)	ICB	24-Nov-06	6-Dec-06	China Railway Turnout Bridge	US$	3,100,138	3,100,138
06N01GTF1I WS0018	0013	Rail materials: Sleeper, fastening and fitting (338,928 pcs. + 2,121,796 sets)	ICB	24-Nov-06	6-Dec-06	China Railway Materials I/E Company	CNY	68,232,626	9,903,087
07N01GTF1I WS0042	0015	Lot 1: Rail (27,643.492 tons)	ICB	4-Jul-07	9-Jul-07	Pangang Group International Economic and Trading Company	CNY	88,514,6879	12,708,464
		Subtotal C						**1,109,363,814**	**48,152,320**
		Total (A+B+C)							**179,986,862**

Source: Asian Development Bank and West Yunnan Railway Company.

RAILWAY TRAFFIC FORECAST

A. Revised Traffic Forecast

1. At appraisal, the project included construction of a 167 kilometer (km) single-track standard-gauge class I railway between Dali and Lijiang to serve 1.1 million population in an area which is rich in minerals and has great potential for tourism. The Dali–Lijiang railway (DLR) was expected to be completed by 2008 and open for trial operations in 2009, with full commercial operations to commence in 2010. Traffic of 5.4 million tons of freight and 3.1 million passengers was projected for 2010, and 7.2 million tons of freight and 4.4 million passengers for 2015.

2. In practice, the DLR was completed in September 2009, trial operations were carried out from October 2009 to 2010, and full commercial operations started in 2011. During October–December 2009, the DLR carried 18,270 passengers. The number of passengers rose to about 1.04 million in 2010, 2.02 million in 2011, and 2.60 million in 2012. Freight traffic was insignificant in 2011 and even in 2012 (0.07 million tons).

3. Updated traffic projections have been developed for the DLR from 2012 to 2028. These were based on the actual traffic between 2010 and 2012, taking into account (i) the actual and expected economic and industrial development and population growth in the project area and Yunnan, (ii) new railway lines, and (iii) gross domestic product growth trends. Comparison of the traffic forecast at appraisal and revised traffic forecast is in Table A10.1, and the revised traffic forecast at project completion is in Table A10.2.

B. Reasonableness of Revised Traffic Forecast

4. At appraisal, there was no railway between Dali and Lijiang. Travel by road took 17 hours from Kunming to Lijiang and 8 hours from Dali to Lijiang. The DLR is 20 km shorter than the existing road and provides a safe, reliable, and low-cost transport mode. It reduced travel time for passengers to 9 hours from Kunming to Lijiang and 2 hours from Dali to Lijiang. Even with improvement of the existing road, the DLR remains competitive. Bus travel from Kunming to Lijiang takes about 8 hours and costs CNY180–CNY240 per trip; from Dali to Lijiang it takes 4 hours and costs CNY60–CNY70 per trip. By comparison, travel by the DLR takes 9 hours from Kunming to Lijiang and costs CNY75, and from Dali to Lijiang takes 2 hours and costs CNY32 per trip. For freight, the road tariff is CNY0.65/ton-km, while the average freight tariff by the DLR is CNY0.35/ton-km. Although an expressway between Dali and Lijiang is under construction and expected to open during 2013, travel by the expressway is expected to be much more expensive. Yunnan province is considering an increase in toll charges and will levy additional tolls on bridges and tunnels in 2013.

5. There are several industrial development projects that would result in new industries that have indicated a preference for using rail transport. There are also existing industries that have expressed interest in using rail, through discussions with local government officials as well as the West Yunnan Railway Company (WYRC). These industries and estimated quantities to be shipped are described further in this section. As there is an expressway being developed in the Dali–Lijiang corridor that would pose a potential threat to the railway's attractiveness, only 50% of expected traffic from these new and existing industries have been incorporated in the economic analysis. In addition, several new railway lines that would have a direct impact on DLR traffic are already under construction and/or planned (these lines are identified further in this section). As several of these lines are already under construction and traffic forecasts have

been made for future traffic, 75% of the estimated future freight traffic from these new lines has been included in the economic evaluation of the DLR. The reason for the difference in the adjustment rates for this new traffic (50% of new and existing industry traffic and 75% of freight traffic from new rail lines) is the level of confidence in these projections. Industries along the DLR corridor will have the option of using the new expressway (now under construction) while traffic from the new rail lines will more likely be routed through the DLR. Of course, these are just projections and are not known with certainty, but the adjustments (50% and 75%) reflect the mission's opinion regarding the likelihood of this future traffic materializing.

Table A10.1: Traffic Forecasts Comparison

Item	2010	2015	2016	2017	2018	2019	2020	2025
Appraisal Forecast (million)								
Freight								
Tons	5.4	7.2	7.7	8.1	8.7	9.2	9.8	12.2
Ton-km	640.0	872.7	929.5	974.7	1,043.5	1,099.9	1,168.8	1,456.6
Passengers								
Number of Passengers	3.1	4.4	5.2	5.5	5.7	5.9	6.2	8.5
Passenger-km	448.4	637.8	780.5	825.5	855.5	885.5	900.4	1,233.6
Revised Forecast (million)								
Freight								
Tons	0	3.92	5.12	6.65	8.52	9.02	11.8	15.63
Ton-km	0	631.1	824.3	1,070.7	1,371.7	1,452.2	1,899.8	2,516.4
Passengers								
Number of Passengers	1.04	3.26	3.54	6.85	7.40	7.99	8.62	11.62
Passenger-km	167.4	524.9	569.9	1,102.9	1,191.4	1,286.4	1,387.8	1,870.8
Net Changes (Revised – Appraisal)								
Freight								
Tons	(5.4)	(2.2)	(2.58)	(1.45)	(0.18)	(0.18)	6	8.8
Ton-km	(640.0)	(64.3)	(105.2)	96.0	328.2	352.40	731.0	1,059.8
Passengers								
Number of Passengers	(2.1)	(1.68)	(1.66)	1.35	1.7	2.09	2.4	3.1
Passenger-km	(281.0)	(112.9)	(210.5)	277.4	335.9	400.9	487.4	637.2

( ) = negative.
Source: Asian Development Bank.

Table A10.2: Reevaluated Traffic Forecasts

Year	Freight Traffic (million tons)					Passenger Traffic (million)		
	Existing Tons	On-line Industries	New Lines	Lijiang City	Total Tonnage	Existing Passengers	Future Passengers	Total Passengers
2004								
2005								
2006								
2007								
2008								
2009								
2010						1.04		1.04
2011	0.002				0.00	2.02		2.02
2012	0.070				0.07	2.61		2.61
2013	0.070	0.90	0.0		0.97	2.81		2.81
2014	0.080	1.35	0.0		1.43	3.03		3.03
2015	0.080	3.50	0.0	0.34	3.92	3.26		3.26
2016	0.090	4.34	0.0	0.69	5.12	3.54		3.54
2017	0.100	5.52	0.0	1.03	6.65	3.85	3.00	6.85
2018	0.100	5.91	1.41	1.10	8.52	4.19	3.21	7.40
2019	0.110	6.33	1.41	1.18	9.02	4.55	3.43	7.99
2020	0.120	6.77	3.66	1.26	11.80	4.95	3.68	8.62
2021	0.120	7.11	3.35	1.32	11.91	5.28	3.93	9.21
2022	0.130	7.46	4.52	1.39	13.50	5.63	4.13	9.76
2023	0.140	7.83	4.75	1.46	14.18	6.01	4.34	10.35
2024	0.140	8.23	4.98	1.53	14.89	6.41	4.55	10.97
2025	0.150	8.64	5.23	1.61	15.63	6.84	4.78	11.62
2026	0.160	9.07	5.49	1.69	16.41	7.30	5.02	12.32
2027	0.160	9.52	5.77	1.78	17.23	7.79	5.27	13.06
2028	0.170	10.00	6.06	1.86	18.09	8.31	5.53	13.85

Source: Asian Development Bank.

C. Freight Traffic

1. Industrial Development

6. The DLR has contributed to rapid industrial development and growth of tourism in the project area. There are several new industrial projects, mostly in the vicinity of Lijiang, that will result in significant increases in traffic volumes for the railway. In addition, several industrial projects are in the process of approval and would have positive traffic impacts on the DLR. Some of these companies are currently using road transport. WYRC management has held discussions with these companies, and they have given assurances that their products will be transported by rail within 2–3 years. The main reason that these industries have not used rail already is the delayed completion of the Lijiang freight station, which was completed in late 2011. Until that time, the freight station location was being used as a temporary passenger station while the permanent passenger station was under construction. While the Lijiang freight station is now open, station tracks and storage facilities were still under construction in late 2012 at the time of the project completion mission.

7. The industries that will contribute to future DLR freight traffic are as follows:

(i) **Yunnan Aluminum Company.** This factory will be established in the vicinity of Xiyi station and is expected to begin production by 2015 with 1.5 million tons of output (industrial aluminum). By 2017, output is expected to reach 3.0 million tons per year.

(i) **Yunnan Yunlishin Aluminum Corporation.** This factory will be in the vicinity of Lijiang East station and will produce aluminum for use in the manufacture of

vehicles and is expected to produce 1.2 million tons by 2013 and 2.4 million tons by 2015.

(ii) **China Petroleum and Sinopec.** China Petroleum is expected to ship 200,000 tons of fuel by 2015 and distribute 300,000 tons annually by 2017. Sinopec is expected to distribute 260,000 tons by 2015 and 400,000 tons by 2016.

(iii) **Jinshajiang Zhongyou Company.** This company, located near Lijiang East station, will manufacture equipment for hydro power plants. Production is expected to commence within 5 years (2017), and annual production is estimated at 300,000 tons.

(iv) **Kunming Steel.** Located in the Diqing development zone, the company is expected to receive about 150,000 tons of manganese each year by rail instead of by road.

(v) **Diqing Xinguan Industrial Company.** The company is currently receiving 100,000 tons of chromium by road and has indicated its intention to use rail transport.

(vi) **Qujing Yuezhou Steel Company.** The company is presently shipping 300,000 tons of steel by road and has also indicated its intention to use the railway.

8. There are two industrial parks under development in Lijiang: Nankou and Jinshan. Nankou park will mainly produce pharmaceutical and medicinal outputs; volumes will not be high and traffic potential is limited. However, Jinshan industrial park will include development of an aluminum processing plant which is now under construction as well as other heavy industries. Commitments have already been received from the aluminum plant for rail traffic movement. The Lijiang East freight station is undergoing expansion to accommodate future traffic. This expansion includes two additional tracks at the station to be further extended in order to access future cargo storage areas. Facilities under construction at the station for storage of aluminum, oil, and containers will be sufficient to accommodate future traffic volumes based on discussion between the developers of these industries and WYRC management.

9. Local governments attach great importance to developing traffic for the DLR. A strategic framework agreement has been concluded between the WYRC and Lijiang city. Under the agreement, Lijiang city expects to develop at least 600,000 tons of rail traffic within 2 years.

2. New Railway Lines

10. There are several new railway lines connecting with the DLR that would provide additional traffic. Some of these lines are already under construction while others are included in the planning of the Ministry of Railways (MOR) and preparations are being made to commence construction soon:

(i) **Lijiang–Panzhihua Railway**. This line is planned to be completed within 10 years (2022). It will connect Lijiang with Panzhihua to the east, which is the junction with the existing Chengdu–Kunming railway, and is expected to move about 2.5 million tons annually.

(ii) **Dali–Ruili Railway**. This railway will connect Dali with the border of Myanmar, a region rich in mineral deposits. The first section (Dali–Baoshan) is under construction and expected to be completed by 2018; the second section to Ruili is being designed and is expected to be completed by 2022. Expected traffic on this line is about 2 million tons.

(iii) **Xiangyun–Linchang Railway**. This new line will extend southward from Xiangyun (to the east of Dali) to Linchang. It will likely be completed by 2020, and expected traffic is 2 million tons.

(iv) **Lijiang–Zhongdian**. Construction of this line is expected to commence in 2013 and be completed by 2018. Initial traffic forecasts are for 2.81 million tons.

11. All of these new lines will have junctions at stations on the DLR. While it is difficult to estimate with precision, it has been assumed that at least 75% of the traffic for these new lines will move over the DLR.

D. Passenger Traffic

12. Passenger trains operate on a seasonal schedule, with four pairs of trains operating each day between Kunming and Lijiang, one pair between Dali and Lijiang, and four pairs between Kunming and Dali (Guangtong–Dali section only). During the tourist season, an additional four or five pairs of trains operate between Kunming and Lijiang. Locomotives and passenger coaches are owned by the Kunming Railway Bureau of the MOR.

13. There will be significant improvements to the Kunming–Guangtong–Dali line that will result in additional passengers for the DLR in the future. A new electrified double-track high-speed railway (200 km/hr) will be constructed along this route that will reduce total rail travel time between Kunming and Lijiang from the current 9.0 hours to 3.5 hours. This line is expected to become operational by 2018 with a "soft opening" expected during 2017. Based on discussions with WYRC staff, the existing 4 million passengers between Kunming and Lijiang would increase to 10 million after inauguration of the high-speed line. However, in order not to introduce overly optimistic passenger traffic estimates, this figure was reduced to 6 million. Additionally, during the early years of the service, it would be expected that traffic would not reach the full potential of the line and a further reduction of forecasted passengers of 50% was made and maintained throughout the evaluation period. Therefore, the number of passengers expected to use the high-speed line was estimated at 3 million annually, starting in 2017, with annual growth at a similar rate as for other forecasted passenger traffic.

14. **Traffic growth rates.** In view of the worldwide economic downturn, relatively conservative gross domestic product (GDP) growth rates have been assumed. ADB reported a GDP growth rate of 9.3% for the People's Republic of China (PRC) during 2011.[1] Growth of 7.7% as projected for 2012 and 8.1% for 2013.[2] According to the Yunnan Statistics Bureau, Yunnan province's GDP growth rates have consistently been greater than those of the PRC during recent years. For example, Yunnan GDP increased by 12.3% in 2010, 13.7% in 2011, and 12.6% during the first three quarters of 2012. Dali prefecture also exhibited strong GDP growth of 14.2% in 2011 with industrial value-added increased by 27.4% in the same year.[3] Lijiang city posted GDP growth of 16.5% during 2011 with an increase in industrial value-added of 27.3%[4] and a 35.3% increase in fixed investment.

15. Freight on the Guangtong–Dali line provides an indication of railway growth trends in Yunnan. Between 2007 and 2012 (2012 data extrapolated based on first 9 months), freight

[1] ADB outlook 2012.
[2] The International Monetary Funds' World Economic Outlook of October 2012 projected the PRC's GDP to grow at 8.2% in 2013.
[3] 2011 Statistical Bulletin of the National Economy and Social Development of Dali Bai Autonomous Prefecture.
[4] 2011 Statistical Bulletin of National Economy and Social Development.

traffic on the Guangtong–Dali line, which is also operated by the WYRC, increased at an average annual rate of 7%.

16. Trends in passenger traffic since 2010 were considered, as during 2009 the Dali passenger station was closed for part of the year because of construction of the railway line to Lijiang. During 2010–2012, passenger traffic grew at an average annual rate of 8.7%.

17. In light of the economic development trends in the PRC, Yunnan province, the project area, and the railway sector, and the historic growth rates of rail traffic between Guangtong and Dali, the revised traffic forecast applied an annual growth rate of 6.0% for freight and 7.7% for passenger traffic from 2012 through 2015. From 2015 to 2020, growth rates of 7.0% for freight and 8.7% for passenger traffic were applied. Beyond 2020, lower growth rates have been applied in order to account for any future economic downturns that may affect freight and passenger traffic on the line. These long-term growth rates are two percentage points lower than the 2015–2020 rates: 5.0% for freight and 6.7% for passenger traffic.

ECONOMIC REEVALUATION

A. Evaluation Methodology and Assumptions

1. The economic analysis compared the costs and benefits of the project against the without-project case using the same methodology followed at appraisal. It was conducted in 2004 constant prices in yuan using the domestic price numeraire and covered a period of 24 years from 2004 to 2028.

B. Economic Costs and Benefits

2. The project costs included the actual capital costs for the project, and operation and maintenance costs based on accounting records. Financial costs were expressed in economic terms by applying the adjustment factor of 0.843 used at appraisal.

3. Economic benefits consist of (i) operating cost savings for diverted freight and passenger traffic from roads, (ii) benefits attributed to generated passenger traffic, (iii) time savings for diverted passengers, and (iv) economic value of additional tons of generated traffic due to the new railway. While it is expected that there would be additional benefits from increased spending by tourists in the region, these benefits were not quantified in this evaluation as this increase in tourist spending may be partially offset by a reduction in tourist spending in other parts of the People's Republic of China (PRC).

4. At appraisal, time savings benefits for the journey between Dali and Lijiang were calculated on the basis of 3.2 hours travel time by train and 5.1 hours by bus, with a time savings of 1.9 hours per trip. Actual travel time by train is about 2.2 hours and by bus on the existing road about 4.0 hours, representing a time savings of about 1.8 hours per trip.

C. Economic Internal Rate of Return Reevaluation

5. The reevaluated economic internal rate of return (Table A11.1) is 14. 5%, slightly lower than the 17.0% calculated at appraisal. The primary reason for the slightly lower rate is the delay in achieving the expected traffic growth during early years of the project. The capital expenditures in 2020 and 2024 reflect additional capital costs for the project, expressed as a percentage of total economic construction costs, consistent with the method used at appraisal. The amount in 2028 reflects the residual economic value of the project.

6. Some 88% of benefits (as of 2020) are from freight traffic and 12% from passenger traffic. This composition of benefits is similar to the appraisal results, where 83% of benefits were from freight traffic, 12% from passengers, with the remaining 5% from tourism (tourism benefits were not included in the reevaluation).

7. Sensitivity analyses (Table A11.2) were carried out to test the impacts of (i) a decrease in traffic, (ii) an increase in operation and maintenance costs, and (iii) a decrease in benefits. According to the results, the project will continue to be economically viable.

Table A11.1: Economic Reevaluation

(CNY million)

Year	Capital Expenditure	Operating Costs	Passenger Benefits	Freight Benefits	Total Benefits	Net Benefits
2004	18.2					(18.2)
2005	520.6					(520.6)
2006	883.0					(883.0)
2007	510.1					(510.1)
2008	469.7					(469.7)
2009	878.6				0.0	(878.6)
2010	196.3		32.3		32.3	(163.9)
2011	144.0	126.9	63.0	0.3	63.3	(207.6)
2012	278.1	139.2	81.5	11.6	93.1	(324.2)
2013		123.5	87.8	161.6	249.3	125.8
2014	79.3	129.4	94.6	236.9	331.5	122.7
2015	98.9	153.2	101.8	649.8	751.6	499.5
2016		166.1	110.7	848.9	959.6	793.4
2017		208.4	214.0	1,102.8	1,316.8	1,108.4
2018		229.5	231.1	1,412.9	1,644.0	1,414.5
2019		239.0	249.5	1,495.5	1,745.0	1,506.0
2020	13.4	268.9	269.3	1,957.0	2,226.4	1,944.1
2021		274.9	287.7	1,974.4	2,262.2	1,987.2
2022		293.7	304.9	2,239.0	2,543.9	2,250.2
2023		304.7	323.2	2,350.9	2,674.1	2,369.4
2024	155.0	316.3	342.5	2,468.5	2,811.0	2,339.7
2025		328.5	363.0	2,591.9	2,954.9	2,626.4
2026		341.4	384.8	2,721.5	3,106.3	2,764.9
2027		355.1	407.9	2,857.6	3,265.5	2,910.4
2028	(748.7)	369.5	432.5	3,000.4	3,432.9	3,812.2
					EIRR	**14.5%**

( ) = negative, EIRR = economic internal rate of return.
Source: Asian Development Bank and West Yunnan Railway Company.

Table A11.2: Sensitivity Analysis

Scenario	Change	EIRR
Base case		14.5%
O&M costs	+20%	14.3%
Traffic	–20%	12.7%
Worst case		12.5%

EIRR = economic internal rate of return, O&M = operation and maintenance.
Note: Worst case = O&M costs +20% and traffic –20%.
Source: Asian Development Bank and West Yunnan Railway Company.

FINANCIAL REEVALUATION

A. General

1. The West Yunnan Railway Company (WYRC), the executing agency for the project, was established in August 2004. It operates the Dali–Lijiang Railway (DLR) constructed under the project and the Guangtong–Dali Railway line, which was opened to traffic in 1999.

B. Financial Projections

2. Operating revenues were projected based on future traffic forecasts and actual tariffs in 2012. While tariffs are for specific commodities and vary by distance, the average freight tariff during late 2012 was CNY0.35/ton-kilometer (km),[1] and for passengers CNY0.22/passenger-km which were used in the calculation of the revised financial statements with 5% tariff revisions every 5 years, as at appraisal. During discussions with the WYRC, it was indicated that a possible tariff revision will be evaluated during 2013. Any changes to the tariff can be made by the WYRC petitioning the Kunming Railway Bureau, which will request such changes from the Development and Reform Commission of Yunnan province.

3. The tariffs of CNY0.35/ton-km and CNY0.22/passenger-km were applied starting in 2012 and increased over the evaluation period by 5% every 5 years. Prior to 2012, tariffs were applied that resulted in total revenue that matched the actual revenues shown in the audited financial statements.

4. Operation and maintenance (O&M) costs were obtained from WYRC financial records for 2011 and 2012 and divided into variable and fixed elements. Data from the first 9 months of 2012 were used to develop cost factors to apply to future traffic and to adjust O&M costs accordingly. Of the CNY567.75 million O&M costs in 2012, CNY196.40 million (35%) were identified as directly variable with traffic. These variable costs included fuel and energy costs, rolling stock rental, salaries, and maintenance of rolling stock. As these variable costs could not be readily divided between freight and passenger services, they were allocated on the basis of traffic units (ton-km plus passenger-km). During 2012, there was a total of 2,533.6 million traffic units on the WYRC railway lines. The unit cost of CNY0.0775[2] per traffic unit was obtained by dividing the variable cost of CNY196.4 million by the total traffic units of 2,533.6 million. The unit cost was applied to the traffic units in each year, and the result was added to the fixed portion of the previous years' O&M costs. Actual O&M costs for the Dali–Lijiang line were used for 2011 and 2012 values.

5. The project was financed by (i) a loan of $179.99 million from the Asian Development Bank (ADB), (ii) a loan equivalent to $39.23 million from the Agence Française de Développement (AFD), (iii) a grant of $458.4 million from the Ministry of Railways (MOR), and (iv) a loan of $122.2 million from the Industry and Commerce Bank of China. The ADB loan was for a 25-year period including 5-year grace period with London interbank offered rate (LIBOR)-based interest rate. The AFD loan has a 17-year maturity, including a 5-year grace period with an interest rate of 3.52% per annum. The Industry and Commerce Bank of China loan includes a 1-year grace period, repayment over a 20-year period, and an interest rate of 6.9% per annum.

6. The WYRC achieved some profitability during 2005–2008. Profits turned negative from 2009 primarily because of lower freight revenues and higher interest costs. However, the company is projected to achieve a small net profit in 2012, increasing significantly during subsequent years with the increasing traffic from the DLR. The revised projected financial statements are in Table A12.1.

[1] In the appraisal report, the average freight tariff was CNY0.25/ton-km.
[2] CNY0.06436 in 2004 prices.

Table A12.1: Revised Projected Financial Statement of West Yunnan Railway Company

(CNY million)

Item	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2028
Operational Statistics														
Freight ton-km (million)	402	452	551	640	716.8	802.8	899.2	998.1	1,417.9	1,847.6	1,997.3	1,601.3	1,842.2	6,837.2
Passenger-km (million)	144.4	199	363.7	504	564.5	620.9	676.8	731	819.4	1,293.1	1,385	1,011.0	1,088.9	4,110.9
Freight revenue/ton-km	0.216	0.216	0.223	0.229	0.25	0.251	0.27	0.26	0.17	0.13	0.18	0.35	0.35	0.405
Passenger revenue/pass-km	0.095	0.116	0.093	0.117	0.14	0.133	0.16	0.14	0.1	0.12	0.14	0.22	0.22	0.255
Income Statement														
Operating Revenues	100.6	120.7	156.7	205.5	258.2	284.1	351.1	361.8	323.0	395.4	553.4	782.9	884.3	3,817.2
Other Revenues	5.0	6.0	7.8	10.3	12.9	14.2	17.6	18.1	16.1	19.8	27.7	39.1	44.2	190.9
Less Business Tax	(3.4)	(4.1)	(5.3)	(7.0)	(8.8)	(9.7)	(11.9)	(12.3)	(11.0)	(13.5)	(18.8)	(26.6)	(30.1)	(129.9)
Gross Operating Revenue	102.2	122.6	159.2	208.8	262.4	288.6	356.7	367.6	328.1	401.7	562.3	795.4	898.5	3,878.2
Total Operating Expenses	117	135	156	191	188	183	214	252	316	393	538	568	637	2,380
Operating Income	(15.0)	(12.3)	3.6	18.1	74.4	105.6	142.7	115.6	12.1	8.7	24.3	227.6	261.4	1,498.5
Other Income (Expense)	6.1	(0.2)	(0.8)	(1.1)	(4.0)	(7.6)	(2.3)	(4.5)	(3.6)	(20.2)	(13.4)	(6.9)	(7.7)	(33.3)
Interest Expense	31.0	27.0	23.5	8.6	9.2	9.4	7.2	5.6	7.2	100.8	99.4	97.1	94.7	50.5
Income Tax	(13.2)	(13.0)	(6.8)	2.8	20.2	29.2	44.0	34.8	0.4	(37.1)	(29.2)	40.8	52.5	466.9
Net Profit	(26.8)	(26.4)	(13.9)	5.6	41.0	59.4	89.2	70.7	0.9	(75.3)	(59.3)	82.8	106.5	947.9
Cash Flow Statement														
Cash Inflows														
Net Profit	(26.8)	(26.4)	(13.9)	5.6	41.0	59.4	89.2	70.7	0.9	(75.3)	(59.3)	82.8	106.5	947.9
Add: Depreciation and Other Noncash Items	72.1	72.3	72.3	86.6	86.6	86.6	86.6	86.6	86.6	268.1	268.1	268.1	268.1	393.1
Capital Injection				11.7	423.9	795.1	964.5	520.6						
Short-Term Borrowing		95.0	70.0	15.2	9.2	0.2	10.0	13.9	51.1	36.9	20.1	5.7	22.1	67.2
Long-Term Borrowing	15.0	30.0	55.0	70.0	256.1	518.4	687.2	359.8						
Subtotal Cash Inflows	60.3	170.9	183.4	189.1	816.8	1,459.7	1,837.5	1,051.6	138.6	229.7	228.9	356.6	396.7	1,408.2
Construction Costs/Capital Expenditures	1.8	6.7	4.8	361.2	680.0	1,313.6	1,651.8	880.4						
Debt Service – Principal Repayment		65.0	45.0			45.0	40.0			57.9	60.7	63.7	66.8	110.2
Dividends/Profit Distribution												54.9	75.4	500.0

Item	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2028
Change in Working Capital	66.7	108.3	123.7	(303.6)	(2.2)	(0.1)	(1.1)	(2.2)	(4.2)	(4.7)	(3.1)	(3.6)	(3.9)	(21.7)
Subtotal Cash outflows	68.5	180.0	173.5	57.6	677.8	1,358.5	1,690.7	878.2	(4.2)	53.2	57.6	115.0	138.3	588.5
Net Cash Flows	(8.2)	(9.1)	9.9	131.5	139.0	101.2	146.8	173.4	142.8	176.5	171.3	241.6	258.4	819.7
Opening Balance	40.1	31.9	22.8	32.7	164.3	303.2	404.4	551.3	724.7	867.5	1,044.0	1,215.3	1,456.9	13,568.6
Closing Balance	31.9	22.8	32.7	164.3	303.2	404.4	551.3	724.7	867.5	1,044.0	1,215.3	1,456.9	1,715.3	14,388.2
Balance Sheet														
Assets														
Cash and cash equivalents	31.9	22.8	32.7	164.3	303.2	404.4	551.3	724.7	867.5	1,044.0	1,215.3	1,456.9	1,715.3	14,338.2
Other Assets	82.3	195.0	316.9	20.4	23.6	26.2	29.5	33.3	50.9	67.6	73.3	79.6	86.1	301.2
Fixed Assets	2,347.0	2,353.2	2,355.1	2,710.7	2,710.7	2,710.7	2,710.7	2,710.7	2,710.7	2,710.7	2,710.7	2,710.7	7,806.8	10,820.2
Less: Accumulated Depreciation	(171.1)	(243.3)	(315.5)	(402.0)	(488.5)	(575.1)	(661.6)	(748.1)	(834.6)	(1,102.6)	(1,370.6)	(1,636.6)	(2,467.2)	(7,693.3)
Construction in Progress	1.1	5.7	6.1	23.9	704.4	1,858.6	2,525.4	3,139.3	4,287.8	4,544.3	4,732.6	5,096.1	0.1	0.1
Deferred Assets	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	
Total Assets	**2,292.6**	**2,334.7**	**2,396.5**	**2,518.4**	**3,254.4**	**4,425.7**	**5,156.1**	**5,860.6**	**7,082.9**	**7,264.5**	**7,361.7**	**7,707.0**	**7,141.3**	**17,816.4**
Liabilities														
Short-Term Loan	236.5	45.1	70.1	85.3	94.5	94.7	104.7	118.6	169.7	206.6	226.7	232.4	254.5	805.1
Other Current Liabilities	25.4	28.6	24.3	31.4	36.8	39.5	44.0	49.9	71.7	93.2	102.1	111.9	122.3	525.7
Long-Term Bank Loan	796.1	30.0	85.0	167.1	208.6	372.4	189.1	299.0	1,278.4	1,759.3	1,908.5	2,152.8	1,642.5	186.8
Total Liabilities	1,058.0	103.7	179.4	283.8	339.9	506.6	337.8	467.5	1,519.8	2,059.1	2,237.3	2,497.1	2,019.3	1,517.6
Equity Capital														
Paid in Capital	1,324.3	2,342.0	2,342.0	2,353.8	2,992.9	3,938.1	4,748.2	5,252.2	5,421.4	5,138.9	5,117.3	5,172.8	5,057.8	5,057.8
Reserves							1.6	14.2	37.4	78.8	94.1	110.5	133.2	1,117.1
Retained Earnings	(89.7)	(111.0)	(124.9)	(119.2)	(78.4)	(19.0)	68.5	126.7	104.3	(12.3)	(87.0)	(73.4)	(69.0)	10,123.9
Total Equity Capital	1,234.6	2,231.0	2,217.1	2,234.5	2,914.6	3,919.1	4,818.2	5,393.0	5,563.1	5,205.4	5,124.4	5,209.9	5,122.0	16,298.8
Total Liabilities and Equity	**2,292.6**	**2,334.7**	**2,396.5**	**2,518.4**	**3,254.4**	**4,425.7**	**5,156.1**	**5,860.6**	**7,082.9**	**7,264.5**	**7,361.7**	**7,707.0**	**7,141.3**	**17,816.4**
Performance Indicators														
Operating Ratio	115%	110%	98%	91%	72%	63%	60%	69%	96%	98%	96%	77%	71%	61%
Debt to Equity Ratio	86%	5%	8%	13%	12%	13%	7%	9%	27%	40%	44%	48%	39%	9%
Debt-Service Ratio		0.4	0.7	6.9	17.5	4.3	4.6	14.5	1.9	2.9	3.6	7.1	6.0	10.7

km = kilometer.

Note: Revenue, operating cost, and nonoperating costs reflect actual expenses from the company's income statements for 2006–2011; tariffs were adjusted to reflect the actual revenues. Total operating expenses prior to 2006, from report and recommendation of the President (RRP), 2006–2011 from the audited financial statements, 2012 based on financial records obtained during the mission; beyond 2012 based on expenses/traffic unit. Other income = prior to 2006 based on RRP, 2006–2011 from the audited financial statements; beyond 2011 based on RRP.

Source: Asian Development Bank and West Yunnan Railway Company.

C. Achievement of Financial Covenants

7. The loan covenants require that the WYRC maintain (i) an operating ratio of not more than 75%, (ii) a debt service coverage ratio of at least 1.2, and (iii) a debt–equity ratio of not more than 60:40, starting from the third fiscal year of commencement of the commercial operations of the project railway. Table A12.2 provides a forecast of the operating costs and revenues for the WYRC during 2011–2028, and Table A12.3 provides status of compliance. These financial covenants were calculated in accordance with the methodology specified in the legal agreements.[3]

Table A12.2: Projection of Operating Ratio for West Yunnan Railway Company

Year	Operating Revenue	Operating Cost	Operating Ratio
2011	563	538	0.96
2012	795	568	0.71
2013	899	637	0.70
2028	3,878	2,380	0.61

Note: West Yunnan Railway Company actual 2011 and 2012 (2012 projected from 9 month's actual).
Source: Asian Development Bank and West Yunnan Railway Company.

Table A12.3: Status of Compliance with Financial Covenants

(CNY million)

		2011		
Indicator	Covenants	Actual	At Appraisal	Status
Operating ratio	No more than 75%	96%	76%	Not yet compliant
Debt service coverage	At least 1.2	3.60	3.50	Compliant
Debt–equity ratio	Not more than 60:40	44:56	28:72	Compliant

Source: Asian Development Bank and West Yunnan Railway Company.

8. Of the three financial covenants, two—debt service coverage ratio and debt–equity ratio—were complied with in 2011. Although the WYRC's operating ratio was 96% in 2011, higher than the required ratio of 75%, it is expected that the WYRC will be able to meet the target during 2013, which is the third full year of operation, as stated in the covenants. This is due to the relatively heavy traffic on the Guangtong–Dali line that cross-subsidizes losses during the early years of the DLR operation.

D. Financial Analysis

9. The financial internal rate of return (FIRR) for the project was reevaluated using the methodology followed at appraisal (Table A12.4). It is based on financial and operational information obtained from the WYRC together with assumptions regarding future revenue and costs. It covers a period of 24 years from 2004 to 2028 and excludes inflation and impacts of currency fluctuations on an after-tax basis. Actual costs incurred for construction and O&M were identified for each available year and then expressed in 2004 constant prices.

[3] Operating ratio = maintenance and operating cost divided by operating revenue; debt service coverage = net cash from operations divided by debt service obligations; debt–equity ratio = total debt divided by total equity.

Table A12.4: Financial Reevaluation
(CNY million)

Year	Capital Expenditure	Operating Costs	Freight Revenue	Passenger Revenue	Other Revenue	Business Tax	Net Cashflow
2004	23.9						(23.9)
2005	668.4						(668.4)
2006	1,117.0						(1,117.0)
2007	615.7						(615.7)
2008	535.4						(535.4)
2009	1,008.5						(1,008.5)
2010	218.1			45.0	6.7	1.7	(168.1)
2011	151.8	150.6	2.65	21.00	3.5	0.9	(276.2)
2012	285.8	165.1	5.61	18.66	3.6	0.9	(423.9)
2013		146.5	39.21	122.19	23.89	6.0	32.7
2014	94.1	153.5	57.50	131.60	27.99	7.0	(37.5)
2015	117.4	181.7	157.71	141.74	44.32	11.1	33.5
2016		197.1	206.03	154.07	53.29	13.4	202.9
2017		247.2	267.66	297.88	83.70	21.0	381.0
2018		272.3	342.95	321.58	98.35	24.7	465.9
2019		283.5	363.00	347.18	105.11	26.4	505.3
2020	15.9	319.0	475.01	374.85	125.78	31.6	609.2
2021		326.1	479.23	400.44	130.19	32.7	651.0
2022		348.4	543.44	424.37	143.24	36.0	726.7
2023		361.4	570.61	449.75	151.01	38.0	772.0
2024	183.9	375.2	599.14	476.68	159.22	40.0	635.9
2025		389.7	629.10	505.25	167.88	42.2	870.3
2026		405.0	660.56	535.57	177.03	44.5	923.6
2027		421.2	693.58	567.75	186.68	46.9	979.9
2028	(888.2)	438.3	728.26	601.89	196.86	49.5	1,927.4
						FIRR	**4.6%**

( ) = negative.
Note: Taxes refer to business taxes only.
Source: Asian Development Bank and West Yunnan Railway Company.

10. Capital costs included in the financial analysis were based on actual annual expenditures incurred for the project during 2004–2012 and consist of actual capital costs in each year during the construction period as well as the requirement for future capital additions as was incorporated at appraisal. These costs are expressed in constant 2004 prices. The residual value is estimated at 19%, consistent with the method used at appraisal. Operating costs are actual values for 2011 and 2012, and for future years the variable O&M cost due to traffic is added to the prior years' fixed cost.

11. Revenues include freight and passenger revenue as well as other revenue from rail operations. Freight and passenger revenues are projected based on the revised traffic forecast in comparison to CNY0.25 per ton-km for freight and CNY0.27 per passenger-km for passengers as used at appraisal. This other revenue was found to be 14.8% of the sum of freight and passenger revenue, based on actual results of the WYRC during 2011 and 2012 (9 months data).[4] This other revenue consists primarily of rental incomes for equipment and income for loading and unloading of customers' cargo.

12. The weighted average cost of capital (WACC) has been reevaluated based on the actual capital mix and costs of funds. It was computed on an after-tax basis and in real terms. The grant from the Ministry of Railways was considered as equity, and the opportunity cost of the

[4] Based on detailed cost and revenue statements for the WYRC for 2011 and 2012 (annualized from 9 months data), total passenger plus freight revenue for the 2 years was found to be CNY928.77 million and other revenue was CNY137.90 million, or 14.8% of direct revenue.

equity used 8% assumed at appraisal; the cost of ADB and AFD loans was taken to be 3.52% and commercial loans 6.90%. The WACC is recalculated to be 3.86%. It is recognized that the 8% cost of equity may not be reflective of current conditions. If a value of 4% was substituted, the WACC would fall to 1.61%

13. The FIRR is reevaluated to be 4.6% (Table A12.4). This is slightly lower than at appraisal, primarily because of lower traffic volumes during the early years of the project. However, it is still significant as it exceeds the revised WACC of 3.86%. Thus, the project remains financially viable.

14. Sensitivity tests were conducted to assess the impact of possible adverse variations in traffic and tariffs on the FIRR over the evaluation period. Table A12.5 indicates that, for every scenario, the FIRR remains significant compared with the revised WACC of 3.86%.

Table A12.5: Sensitivity Analysis

Scenario	Change	FIRR
Base case		4.6%
O&M costs	+10%	4.3%
Freight traffic	–10%	4.1%
Passenger traffic	–10%	4.4%
Worst case (O&M + 10%; traffic –10%)		3.7%

FIRR = financial internal rate of return, O&M = operation and maintenance.
Source: Asian Development Bank and West Yunnan Railway Company.

LIST OF DALI–LIJIANG RAILWAY STATIONS

Construction Design Mileage	Mileage Measured after Completion	Category	Length of Access Road of Station (km)	Remarks
DK7+800	K7+882.92	Intermediate station	5.0	
DK18+700	K18+700	Passing station	1.0	
DK25+150	K25+152.37	Passing station	0.0	opening postponed
DK34+850	K34+852.37	Passing station	3.0	
DK44+110	K44+112.37	Passing station	0.0	opening postponed
DK52+700	K52+269.24	Intermediate station	3.4	
DK61+800	K61+369.24	Passing station	0.0	opening postponed
DK71+544	K71+243.57	Passing station	0.0	
DK80+725	K80+356.8	Passing station	0.0	opening postponed
DK89+600	K88+992.6	Passing station	3.3	
DK96+900	K96+292.6	Passing station	0.0	opening postponed
DK105+210	K104+514.64	Passing station	0.0	
DK117+700	K116+859.4	Passing station	0.0	
DK128+400	K127+122.24	Intermediate station	4.2	
DK137+350	K136+099.85	Passing station	0.0	opening postponed
DK146+375	K145+124.85	Passing station	0.0	
DK155+000	K153+749.85	Passing station	5.0	opening postponed
DK165+400	K164+506.82	Intermediate station	5.0	

Notes: There are 18 railway stations at the preliminary design period. Except for the seven stations where opening was postponed, the other 11 stations are new.
Source: Ministry of Railways, West Yunnan Railway Company, and the Dianxi Railway Construction Headquarters.

SOCIAL AND POVERTY IMPACT ANALYSIS

A. Introduction

1. Construction of the 167 kilometers (km) Dali–Lijiang Railway (DLR) began in June 2005 and it was put into operation on 28 September 2009. Based on these dates, where possible, performance and/or socioeconomic indicators have been collected for 2004 (before the project), 2009 (end of construction), and 2011 (during operation). The DLR traverses three counties in Yunnan in a less-developed mountainous area. The poverty and social analysis conducted during project planning indicated that construction of the DLR would (i) improve access to markets and affordable goods and services, and (ii) help create the conditions necessary for developing local resources and generating employment and income-enhancing opportunities to raise living standards in the project area.

2. The project area included Dali county and Heqing county in Dali Bai autonomous prefecture and Lijiang county-level city.[1] In 2003, about 73% of the 1.10 million people in the project area were ethnic minorities: Bai (46.2%), Naxi (18.3%), Yi (3.2%), and Lisu (2.8%). By 2010, the population had grown to 1.36 million. The boundaries of analysis (BOA)[2] for the project included seven counties: Eryuan, Jianchuan, Lanping, Ninglang, Weixi, Xianggelila, and Yongsheng.

3. The economy in the project area is booming. A total of CNY83 billion was invested in the project area between 2005 and 2009,[3] and CNY1,483 billion was invested in Yunnan during the same years. The DLR provided an investment of CNY5.1 billion. Investments in the area resulted in poverty reduction, increased income and employment opportunities, and improved access to market and social services.

B. Increased Rural Income and Poverty Reduction

4. The project area targeted for development in the 11th Five-year Plan has experienced considerable growth since 2004 (Table A14.1). Between 2004 and 2010, the per capita gross domestic product in the project area grew by 142% in Dali, 147% in Lijiang city (Gucheng district), and 299% in Heqing,[4] which has been attributed to a dramatic increase in tourism, mostly via the DLR. Notably, Heqing county experienced 45.2% growth (from CNY9,367 to CNY13,609) between 2010 and 2011. The counties in the BOA also experienced high growth, ranging from 180% in Juanchuan to 635% in Shangri-La, with the other BOA counties experiencing 200%–260% growth.

5. Rural incomes have also increased considerably. In the project area, incomes increased between 2004 and 2010 by 66% in Dali county (CNY3,256 to CNY4,733), 143% in Lijiang city (Gucheng district) (CNY2,145 to CNY7,012), and 157% in Heqing county (CNY1,325 to CNY4,110). During the same period, rural incomes increased by 116% in Yunnan (CNY1,864 to

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[1] In 2004, Lijiang city was divided into Gucheng district and Yulong Naxi autonomous county. Gucheng district falls in the project area; Yulong Naxi autonomous county falls in the boundaries of analysis. Where possible, data is presented separately for the two counties with Gucheng district representing Lijiang city.

[2] The BOA are the neighboring counties to the project area for which a social due diligence study was completed in order to evaluate any impacts beyond the project area and identify any issues that may arise. Where possible, data is presented for the BOA, as well as the project area.

[3] Dali Statistics Bureau; Lijiang Statistics Bureau. Dali county CNY27,799,290,000, Heqing county CNY7,169,070,000, and Lijiang city CNY48,032,000,000.

[4] Before the 11th Five-Year Plan, Heqing county was quite poor and did not initially attract tourists, who bypassed the county in favor of Dali and Lijiang. Now the DLR provides convenient, low-cost transport for tourists and freight movements via Heqing county.

CNY4,722). The counties in the BOA experienced 76%–200% growth. The 12 townships[5] within the project area, which provided local labor, materials, goods, and services, experienced high income growth (23%–47% in Dali county, 145%–186% in Gucheng county, and 54%–175% in Heqing county), though the average annual per capita income in Shuanglang and Songgui townships was still close to the 2009 poverty line (CNY1,196).

6. In 2003, 372 key poverty reduction villages were located in the project area, of which 27 villages were located in the project railway corridor townships. By 2011, the number of key poverty reduction villages in the project area had fallen to 308, of which only 17 villages are located in the project railway corridor townships. Poverty incidence in 2002 was estimated at 30.0% (CNY900 threshold) in the project area. By 2010, poverty had dropped to just 9.1% (CNY1,274 threshold).[6]

C. Increased Rural Development and Reduced Living Costs

7. During construction of the DLR, 398.6 km of roads were constructed in the project area, of which 139.0 km of paved construction access roads and 29.9 km of paved station connecting roads for 11 stations were financed by the project. The roads have been handed over to local governments for public use, easing transportation from villages to the DLR stations and improving intervillage transportation.

8. Railways can directly increase competition among local freight forwarders and wholesalers, which benefits poor farmers with fair transport pricing, thereby increasing farm gate prices. According to one Lijiang resident, the DLR has increased access to markets for Yi minority potato farmers. Before the DLR, the farmers sold their products locally, carrying the potatoes from village to village, quite often selling for a low price (estimated at CNY1.0–CNY1.2 per kilogram [kg]). After completion of the DLR, merchants from elsewhere in Yunnan arrived in the area and paid up-front for the potato crops (CNY2–CNY3/kg), using the DLR to transport the potatoes to other markets.

9. The DLR has also contributed to lowering the cost of living for those living in Lijiang, and availability of a wider range of products compared to 2004. Before the DLR, electronics from Kunming were marked up by 20%–30%. Since operation of the DLR, prices have fallen and are slightly higher than prices in Kunming. Residents from Heqing county also take the railway to Lijiang in the morning to sell their produce and return to Heqing county in the evening.

D. Labor and Employment

10. During project planning, it was anticipated that about 96,800 person-years of construction-related employment would be created, 60% of which would be unskilled. To ensure that employment was inclusive of local communities, 50% or more of unskilled labor was to be targeted for the poor, ethnic minorities, and women. The WYRC reported that, in addition to many jobs created in the provision of equipment and rail for the project, construction activities provided 87,687 person-years of construction-related employment directly, including about 35,952 person-years of unskilled labor (41%), of which about 19,773 person-years (55%) were hired from the local market. Ethnic minorities made up 78% of unskilled labor, and women 10%. Average daily wages ranged from CNY30 to CNY80. As of October 2012, 356 people are employed by the WYRC in operating the DLR. Of these, 91 (25.5%) are from ethnic minorities and 105 (29.5%) are women; they are employed mostly in unskilled work. In addition, about

[5] Dali county: Fengyi, Haidong, Shangguan, Shuanglang, and Wase; Heqing county: Caohai, Jindun, Songgui, Xiyi, and Xintun; Lijiang city: Jinshan and Qihe.

[6] The poverty threshold was almost doubled, from CNY1,274 in 2010 to CNY2,300 in 2011.

21,000 person-months of national consulting services were recruited by the WYRC to ensure that the project was constructed in accordance with the national standards and ADB's requirements. The WYRC fell short of the construction-related employment target and employed fewer unskilled laborers (40% compared to the targeted 60%). The WYRC attributes this to increased mechanization during construction requiring more skilled laborers to operate the machinery and fewer unskilled laborers to complete the work. The target to employ ethnic minorities and women in unskilled labor was exceeded (55% compared to the targeted 50%).

11. Locally procured construction materials and supplies also provided indirect employment and income-generation opportunities in the project area. The total cost of the DLR was CNY5.1 billion, of which about CNY705 million (according to WYRC estimates) was invested in the local economy of the project area for procurement of local materials (about 20%–30% of construction materials used in civil works), wages of local workers, living costs for construction workers from outside the area, office rental and equipment for the construction contractors, fuel for construction machinery, cost of minor and major temporary works, and business tax for construction.

E. Safe and Affordable Mobility

12. Dali, Yunnan's second-largest city, has good rail, road, and air transport services. Similarly, Lijiang, an increasingly popular tourist destination, is becoming more accessible, not only with completion of the DLR but also with the recent airport expansion, construction of an expressway between Dali and Lijiang (to be completed in 2013), and extension of the railway northward to Xianggelila (Zhongdian) for increased connectivity between Kunming and Zhongdian via Dali and Lijiang.[7]

13. The DLR connects to the Kunming–Dali railway, opening up accessibility from the project area to the rest of the province and elsewhere in the PRC. During the trial operations phase, passenger numbers increased from 28.8% of capacity at the beginning to 92.0% of capacity after 12 months, transporting 1,305,000 passengers. Full commercial operation of the DLR began on 1 January 2011. The WYRC reported that no accidents have occurred on the DLR.

14. As of October 2012, there were four pairs of passenger trains operating daily between Kunming and Lijiang and one pair between Dali and Lijiang. During peak seasons, four to five additional pairs are added to the Kunming–Lijiang route. The capacity of the passenger trains ranges from 980 to 1,190. It has been estimated by the WYRC and a chief conductor that about 80% of the passengers are tourists, slightly higher than the 75% estimated at appraisal. The remaining 20% are local passengers, primarily ethnic minorities.

15. Travel via the DLR is less expensive and less time consuming than bus transportation. Bus travel from Dali to Lijiang takes about 4 hours (180 km) and costs CNY60–CNY70 per trip. From Kunming to Lijiang, bus travel takes about 8 hours and costs CNY180–CNY240 per trip. By comparison, the DLR takes about 2 hours to cover 163 km from Dali to Lijiang and costs CNY32 per trip, and about 9 hours from Kunming to Lijiang (518 km) for CNY75.

F. Tourism

16. At appraisal, it was anticipated that the DLR would change the pattern of tourism travel and provide travel cost savings to tourists. For example, many tourists now choose to take the

[7] Construction is planned to start in 2013 and be completed by 2018.

overnight train from Kunming to Lijiang, saving on accommodation. The number of tourists visiting the project area increased between 2004 and 2011 by 42% in Dali county, 175% in Lijiang city (Gucheng county), 498% in Heqing county, and 179% in Yunnan. The most notable figure attributable to the DLR is the tourism increase in Heqing county. The county was previously a bypass route from Dali to Lijiang, but with the train stopping in Heqing county and development of tourism-related activities and sites in the area, the number of tourists has increased. Revenue from tourism increased by almost 3,500% between 2004 and 2011. By comparison, tourism-related revenue increased in Dali county by 174%, in Lijiang city by 323%, and in Yunnan by 252%. The proportion of foreign tourists visiting the project area, particularly Lijiang city, is increasing, along with revenue per tourist. After the opening of the DLR, the Lijiang airport underwent expansions to allow larger aircraft to fly into the airport, bringing more tourists by air.

G. Awareness and Prevention of HIV/AIDS

17. Railway contractors established camps with facilities to address health and safety concerns as a standard requirement. Adequate health facilities were provided in the construction camps. The contractors provided information on HIV/AIDS and drug use to all new workers as part of the induction training, and distributed posters, calendars, brochures, and condoms. The local government has a very active HIV/AIDS awareness and prevention campaign in the project area. Local clinics and hospitals are also available and quite sufficient. During operation, the local health bureaus and HIV/AIDS offices in Dali and Lijiang will continue HIV/AIDS awareness and prevention in the project area.

H. Gender Development

18. In 2003, women constituted 46% of the total population in the project area, and they were primarily engaged in agricultural activities. The female labor participation rate was high (48%), and male members from poor households tended to travel further for migrant labor opportunities than nonpoor males, leaving behind a high percentage of poor households headed by women. Women and ethnic minorities were identified as priorities for unskilled employment during construction of the DLR. Monitoring data collected over the construction phase of the project indicated that, among the local employment, about 10% of unskilled work went to women. Average daily wages ranged from CNY40 to CNY80 for men and CNY20 to CNY50 for women. The disparity is attributed to the difference in positions held—men typically filled physically demanding jobs and women generally worked in catering and services for the construction workers. Nonetheless, the opportunity to derive additional cash income was a benefit for women. For DLR operation, 105 women were hired as permanent staff (29.5% of total staff).

I. Conclusion

19. Overall, the project has contributed to improving the socioeconomic status of the project area. However, because the WYRC did not complete a baseline (or any other) socioeconomic survey as required in the project performance management system (Appendix 5 of the project administration manual), it was difficult to ascertain specific improvements attributable to the project. Secondary data formed the basis of this analysis and was sufficient to show the socioeconomic trends in the project area.

ENVIRONMENTAL IMPACT ANALYSIS

A. Introduction

1. The project involved construction of a 167 kilometer (km) single-track standard gauge class I railway between Dali and Lijiang and 11 new railway stations; 100.89 km or 62% of the alignment is on bridges or in tunnels. The project also included a safety component to provide modern technology and equipment for signaling, communications and management information system, and training and institutional capacity development for the West Yunnan Railway Company (WYRC). Construction was completed over a period of 5 years and the railway started trial operations in September 2009. In 2008, the traction method was adjusted from diesel to electric and electrification was completed in 2011.

2. The Asian Development Bank (ADB) classified the project as environment category A. The domestic environmental impact assessment (EIA) and soil erosion protection plan were prepared in 2003. The EIA was approved by the State Environmental Protection Administration (SEPA) on 26 October 2004. A summary EIA (SEIA) including mitigation and monitoring measures was prepared for ADB in July 2004. The SEIA concluded that impacts from the project construction are mostly short term and reversible, while long-term impacts result mainly from land conversion for the right of way and induced development. A second domestic EIA was prepared to cover traction design modifications in May 2008, with approval at a national level in August 2008. Electrification was financed with domestic funds.

3. The domestic procedures require the concerned government authorities to provide final clearance that project environmental and soil erosion protection measures have been completed to the required standard. A final acceptance report for the domestic EIA was prepared in February 2012. The site review by the Ministry of Environmental Protection (formerly the SEPA) was carried out in November 2012, and finally approved on 28 January 2013. The domestic soil erosion acceptance report has been completed and will be submitted to the Ministry of Water Resources of the People's Republic of China (PRC) for approval by June 2013.

4. The ADB project completion mission in October 2012 held consultations with the government, its project management office (PMO), and its environmental consultants, and visited the project site to review the effectiveness of environmental management and protection measures. The key findings are summarized in the account that follows.

B. Environmental Protection and Management

5. The SEIA included tables summarizing (i) pollution impacts and mitigation measures, (ii) details of environmental monitoring program, and (iii) ecological protection works. The text states that "a satisfactory EMP [environmental management plan] is required prior to ADB approval of the project." There are no project records that suggest a more detailed EMP was prepared.

6. The Dianxi Railway Company PMO established an environmental protection office which was led by the project manager and included three environment professionals responsible for coordinating environmental management and overseeing environmental commitments during implementation. It was confirmed that the design, tender, and contract documents incorporated the requirements for environmental protection as specified in the SEIA.

7. Daily monitoring and supervision of construction was carried out by two supervision companies—the Construction Project Management Company of Southwest Jiatong University and the Yunnan Railway Engineering Supervision Company. Supervision offices included divisions responsible for daily monitoring of environmental protection and soil and water conservation measures. Some of the contractors had environmental management systems certified under international standard ISO 14001. The MOR and PMO project personnel, contractors, and supervision units attended environmental training courses on environmental management and monitoring requirements. The list of participants in training for each 6-month period is provided in the respective semi-annual environmental monitoring reports (EMRs), which were submitted to ADB.

8. The Beijing OASIS Environmental Protection Technology Company was contracted by the PMO as the loan implementation environmental consultant. It was responsible for preparing and delivering environmental training, carrying out site audits, identifying and resolving environmental issues, and preparing the semi-annual EMRs for ADB. The Yunnan Archaeology Institute was commissioned to carry out archaeological investigations along the alignment prior to earthworks.

9. At appraisal, the ADB SEIA estimated that the total environmental protection investment would be approximately CNY461.83 million, inclusive of CNY232.22 million for water and soil erosion protection. According to the government, and as detailed in the domestic environmental acceptance report, the actual total investment for environmental protection was CNY275.23 (or $41.46 million), which represents 5.15% of the total project investment. During the review mission on 16–20 May 2010, additional funds were agreed for a “green corridor” (CNY16 million), planting of trees along both sides of the railway line, and for additional noise barriers (CNY11 million). The actual costs for environmental protection were CNY18.63 million more than predicted, excluding the additional agreed costs and the soil erosion protection costs which were included in the main civil works contracts. A breakdown of costs is provided in Table A15.1. The government indicated that the difference in the costs is attributable to cost estimate updates and significant changes in currency exchange values between 2004 ($1 = CNY8.2755) and 2012 ($1 = CNY6.3412).

Table A15.1: Environmental Protection Investment
(CNY million)

Item		Domestic EIA Investment Estimate	Actual
Ecology	Greening of stations and railway corridor	10.20	10.54
	Slope protection	105.37	108.31
	Restoration of borrow areas	4.69	118.74
	Retaining and restoration of spoil area	103.16	
	Greening of temporary fields	0.59	0.55
Noise and vibration	Relocation of Beixi Primary School	0.80	0
	Noise barriers	0.00	6.18
	Double-glazed windows	0.11	0
	Seamless long rail	0.40	0.46
	Green corridor	1.20	1.21

Item		Domestic EIA Investment Estimate	Actual
Sewage Treatment	Sedimentation tanks and air-floatation equipment for tunnel water discharge	15.00	14.67
	Oil separation tank and reaction tank	1.70	1.71
	Anaerobic biofilters	0.14	0.19
	Modular container biofilter and constructed wetland	0.57	0.72
	Septic tank	0.02	0.02
Solid waste	Waste transfer stations in Lijiang	0.32	0.03
Total		**234.05**	**263.33**

EIA = environmental impact assessment.
Source: Asian Development Bank and West Yunnan Railway Company.

C. Environmental Monitoring

10. The contractors and supervision companies were responsible for daily monitoring of water, dust, gas, and noise during construction. The local monitoring centers associated with the environmental protection and water resource bureaus in Dali city, Lijiang city, and Heqing city were responsible for environmental and soil erosion protection supervision and management in areas under their respective jurisdictions. They confirmed that monitoring of noise, air, and water quality was carried out every 6 months during construction and that required national standards were maintained. It was also confirmed that monitoring will continue during operation, in accordance with national standards. The frequency of monitoring will be confirmed following the acceptance reviews by the concerned authorities at the end of 2012. The WYRC, the rail operator, has established the Energy Saving and Environmental Protection Unit, which is responsible for environmental management during operation. Further details were not available during the mission.

11. Nine semiannual EMRs were received between 2005 and 2009 and an environmental completion report was received in September 2011.[1] All of these reports have been disclosed on the ADB website.

D. Environmental Impacts and Mitigation Measures

1. Land and Forest Resources

12. During construction, permanent land acquisition was slightly less than predicted and temporary land conversion slightly more. The project permanently acquired 407 hectares (ha) of land, which was 67% agricultural (crops and orchard), 19% forest, and 13% wasteland (Table A15.2). These figures differ slightly from those for resettlement.

13. A total of 229.2 ha of land was occupied temporarily for borrow pits, disposal sites, and other construction facilities such as camps, precast yards, and access roads. The majority of this land was forest (47%) and agricultural land (30%). All temporarily acquired land has been restored as documented in the environmental completion report. It was confirmed that native species were used for restoration that were in keeping with local ecology. The MEP will confirm

[1] The report referred to as environmental completion report is titled Environment Monitoring Summary and was prepared by Beijing OASIS in September 2011.

whether the required restoration standards have been achieved during the final acceptance review at the end of 2012.

Table A15.2: Permanent Land Acquisition Requirements – Planned and Actual
(hectares)

Land Acquisition Type	Forest	Crops (Wet)	Crops (Dry)	Orchard	Wasteland	Other	Total
Permanent Predicted	78.1	39.9	244.3	7.7	36.7	1.7	**408.4**
Permanent Actual	78.6	40.3	224.4	9.9	51.7	2.1	**407.0**

Source: Translated from the domestic EIA acceptance report prepared by Beijing OASIS in February 2012.

2. Soil Resources

14. The EMRs confirm that soil erosion prevention measures were implemented as per the project plan and topsoil was stripped and retained for reuse in restoration. More than 90% of tunnel and excavation spoil was reused in the earthworks and other adjacent construction works. The need for borrowed soil was 75% less than predicted. There were eight borrow pits covering an area of 13.9 ha, and 57 spoil disposal areas covering an area of 30.1 ha. Each EMR provides volumes of borrowed soil and spoil disposal, and provides details of how material has been reused or disposed of, status of retaining walls, stabilization, and recovery of restored sites. Humate soil conditioners were used to facilitate vegetation recovery for some of the spoil disposal areas.

15. One of the main issues identified in the EMRs was the management of spoil disposal areas. In some cases the retaining walls were either not built or were not adequate, and spoil piles were too high and prone to collapse and slides. This was identified as a particular issue in the high mountain and valley sections, such as Heluo Mountain tunnel exit and Bijia Mountain. Local farmers took spoil and rock materials from tunnel spoil disposal sites for local construction. Although this helped reduce the need for disposal, it undermined restoration works which had to be repeated a number of times. Some of the spoil grounds were handed over to the local government for use in road construction.

16. The EMRs and completion reports indicate that another key issue was the quality and timing of restoration of embankments, borrow area, and spoil disposal areas. In some cases, there was too much gravel in the soil or the soil was damaged through too much compaction and it was difficult to establish vegetation. In other cases, planting was done during the dry season and survival rate was low as there was not adequate after care. Despite initial issues, embankment slope stabilization and restoration of borrow pits, spoil disposal sites, construction camps, bridge engineering units, and haul routes is now all reported to have been completed to the required standard. This seemed to be the case from the sites visited during the project completion report (PCR) mission and will be confirmed during the domestic acceptance reviews.

3. Solid Waste

17. During construction, solid waste was stored on site and regularly collected and disposed of at an approved facility. Poor solid-waste management at construction camps and work sites was an issue regularly highlighted in the EMRs; in particular, the presence of garbage in the sewage treatment facilities. The environmental protection costs included funds for the development of a waste transfer station in Lijiang which was completed at considerably less cost than predicted (Table A15.1), and has been handed over to the local government.

18. During the PCR mission, it was confirmed that the stations, depots, and industrial sidings are all served by municipal solid-waste collection services and that locomotive parts, ballast, track, and sleepers will be recycled and reused where possible.

4. Protected Areas

19. The rail alignment runs parallel to the Erhai Lake National Nature Reserve. At its closest, the alignment is 150 meters (m) from the reserve boundary. The environmental training for site personnel included guidance on specific control measures to minimize risk of water pollution. No spoil disposal was allowed within 500 m, and all wastewater from adjacent areas and in-channel river works was treated and transferred to municipal facilities. Discharge in the lake and rivers was prohibited. The Erhai Lake Nature Reserve Management Bureau supervised and inspected construction works close to the lake. During the acceptance review for the EIA the bureau was consulted and provided confirmation that the works had been conducted well and there was no influence on the nature reserve. This was confirmed through a visit to this section by the PCR mission.

20. Although the rail alignment does not have any direct impacts on other protected areas, the wider project area has a number of important reserves, including Cangshan Mountain and Yulong Snow Mountain which are of scenic, biodiversity, and amenity value. These sites are afforded protection through domestic legislation but may come under increased development pressure and visitor numbers from improved accessibility.

5. Water Resources

21. The construction included 78 bridges and 329 culverts. Bridges were designed for a 1-in-100-year storm event and the culverts for a 1-in-50-year storm event. There was one major bridge (311.56 m) that crosses the Dongshan River and one medium bridge (46 m) that crosses the Baitahe River. The rest of the bridges were land bridges. The bridge units established cofferdams to create a confined, dry working environment for pier construction; water pumped out was removed and treated in sedimentation tanks. The social monitoring reports identified some problems with damage to irrigation canals, drainage, and flood protection infrastructure. The contractor compensated for damage and made repairs valued at CNY8,552,000.

22. The construction included 47 tunnels, 48.7% of the total length of the alignment. Sedimentation tanks were established at the entrance and exit of major tunnel sections to manage wastewater. Water inflow was less than predicted for Tashan and Songshuyuan tunnels and the treatment facilities were not used. For Sanyuan and Beiya tunnels, water inflow was more significant and was used for irrigation and other uses locally. Sedimentation tanks constructed at each of the tunnel sites have been handed over to the local government. Construction camps had on-site wastewater treatment facilities.

23. During the PCR mission, it was confirmed that nine stations, the depots, and industrial sidings have dedicated on-site wastewater treatment facilities. Most have anaerobic biofilter modules, whilst Shangguan station has a constructed reedbed. This enables recycling and reuse of water for irrigation. A high-pressure system for washing trains has been adopted that reportedly reduces water consumption by 30%–40% compared to conventional systems.

6. Air

24. During construction, efforts were made to ensure haul routes were maintained through installation of drainage ditches, compaction, levelling with gravel, and spraying with water to control dust. Two complaints were received from local communities about construction dust and impacts on farmland. The loan implementation environmental consultant reported that additional control measures were implemented and affected persons were satisfied with the actions taken.

25. The SEIA predicted significant reductions in air pollutant emissions (total suspended particles, sulfur dioxide, nitrogen oxide, and carbon monoxide) with a shift from other road-based modes to diesel locomotive. The change in traction from diesel to electric has increased haulage capacity by 40% and reduced energy demand by 60%. In 2011, 2.02 million passengers were carried, representing 327 million person-kilometers and a 92% occupancy rate. Freight services started operating in December 2011; during the first 9 months, 51,655 tons were carried. By 2020, it is forecast that the estimated tonnage at appraisal will be exceeded by 60%. The staff living quarters at stations have been equipped with solar thermal heating systems for hot water. The project will make a more significant contribution to emission reductions than predicted at appraisal with the change in traction and projected rate of modal shift and the range of methods adopted to reduce energy and water consumption. In addition, the project included the paving of 139.0 km of access roads between railway stations, townships, and villages and 29.9 km of station access roads which will reduce dust.

7. Noise and Vibration

26. Twenty two noise-sensitive receptors were identified along the alignment. These included 17 villages and five schools. Xiacunrenxinshan Primary School was relocated by the local government as part of the local development plan. The project relocated Beixi Primary School and 66 households as noise levels would have exceeded acceptable standards. Noise barriers were constructed in 12 villages and two schools. Seamless long rails that reduce noise were used at five villages and two schools. Additional funding was agreed for the establishment of a “green corridor” of trees along the alignment to contribute to noise attenuation. The PCR mission considered that, as this corridor is only a single line of young trees which may contribute to screening, a wider belt of planting would be needed to contribute to noise attenuation.

27. Noisy construction activities were restricted to daytime hours. There was one recorded complaint about construction noise. Additional control measures were implemented and reportedly affected persons were satisfied. The 2005 social monitoring report indicates that 94 houses in Haiyin village experienced cracks during the blasting activities associated with construction of the Haiyin tunnel and also made complaints about disturbance from noise and dust levels. Affected households were compensated by the contractor. This was not reported in the EMRs. The EMRs did report a problem with local people constructing new houses on the top of newly constructed tunnels. Local planning departments were informed and asked to assist with the prevention of illegal construction within the right of way, and no further problems were reported.

28. The post-construction public consultation that was carried out as part of the domestic EIA acceptance reporting process identified that respondents considered that noise and vibration was the most significant issue associated with the railway construction and operation (paras. 35–36).

8. Physical Cultural Resources

29. The Yunnan Province Archaeology Research Institute was commissioned by the Cultural Relics Bureau of Yunnan Province and Dianxi Railway Company to carry out an archaeological survey along the rail corridor prior to the earthworks. The archaeology institute explored about 4,000 square meters in Xiangmian Mountain in Heqing with a total investment of CNY1.67 million. Two thousand seven hundred ancient tombs were excavated and 10,000 relics were unearthed from Nanzhao to Ming and Qing Dynasties. A team of 170 people—30 professionals and 140 migrant workers—were involved in the excavation. Relics have been split between the Yunnan Provincial Museum, Yunnan Provincial Archaeology Research Institute, the Museum of Dali Prefecture, and the Museum of Heqing County.

9. Health and Safety

30. The loan implementation environmental consultant reviewed contractor method statements for tunnel construction. Special measures included use of gas alarms and monitoring of gas status three times a day. In sections with a high risk of gas leakage, the gas supervision reports were reviewed by the contractor's environmental monitor. There were no records of alarms or incidents associated with tunnel or bridge construction.

31. The WYRC established a railway protection office responsible for rail safety awareness. There was a major publicity campaign prior to the opening of the railway in September 2009. More than 3,000 posters were posted in villages and townships along the alignment, and campaign videos were shown on local television channels, including minority language channels. There have been no records of incidents or accidents during operation.

32. The incidence and severity of road accidents on the Dali–Lijiang road decreased by 16% between 2010 and 2011. This coincides with the introduction of passenger rail services but is also likely linked to improved regulation. With the projected increase in freight services, this trend is expected to continue.

10. Induced Impacts

33. At appraisal, it was anticipated that increased rail capacity would have a number of negative and positive induced impacts associated with improved accessibility. It is evident that the region is experiencing major growth in tourism and industrial development. An ethnic minorities development plan (EMDP) was designed to ensure that the socioeconomic benefits of the project were inclusive of ethnic minorities in the project area. An external monitor from the Yunnan Nationalities Museum was contracted to review and report on specific activities in the EMDP. The monitor estimated that about 490,000 people have directly benefited from the project through increased income related to construction of the railway and affordable access to rail services and improved income-generating opportunities. Tourism and tourist revenue in the project area has increased dramatically since 2004, particularly in Heqing county which is now served by a passenger station.

34. Six industrial sidings are being constructed along the railway for large-volume industries to encourage transport efficiency. So far, committed tenants include two hydro power development companies and a fuel storage depot for PetroChina Lijiang. A number of other new aluminum and steel projects that will transport their products using the new freight line are also proposed in the area around Lijiang. Strong planning regulation will be needed to protect valuable natural resources in the area.

E. Public Consultation and Information Disclosure

35. Each construction site had environmental protection billboards indicating the name of the project, responsible authorities and personnel, and contract details in the event of a complaint, as detailed in the EMRs. There were a number of documented complaints about construction noise, dust, and influence of dust on adjacent farmland. Grievances were reported to the local environment bureau which coordinated with the construction and supervision units to implement stricter controls.

36. Prior to the preparation of the EIA acceptance report, post-construction public and stakeholder consultation was carried out. One hundred and sixty questionnaires were distributed to members of the public living along the rail alignment. Of these, 126 questionnaires were returned, 91 from men and 35 from women. From the responses it was confirmed that the majority (75%) were supportive of the project and thought it would be beneficial for the development of the region (92%). The most significant environmental issue and influence associated with the construction and operation of the railway was considered to be noise and vibration. Almost half (49%) of the respondents considered that the operation of the railway would increase their family income, while 51% considered that it would have no influence. Fifty four percent of respondents were satisfied, and 46% basically satisfied, with the project environmental performance.

F. Conclusions

37. The PMO and its consultants and contractors demonstrated a satisfactory level of environmental due diligence in the implementation of the project. The environmental protection measures and environmental compliance monitoring and reporting as set out in the SEIA were fulfilled within required budget and time scales. There were some issues during construction including dust and noise disturbance, damage to houses and infrastructure, and poor management of slope and temporary construction facilities stabilization and restoration, however the contractors appear to have taken all necessary actions to address these issues.

38. The SEIA stated a requirement for development of a more detailed EMP. This was never prepared. The environmental quality monitoring was carried out by the county environmental monitoring stations but data was not provided in the EMRs or completion reports or made available during the PCR mission. These issues could have been identified and addressed by ADB at an earlier stage had more specialist environmental supervision during implementation been provided. Despite this, all available information indicates that adverse impacts of the construction and operation of the project were reduced to an acceptable level and that residual impacts will be offset by long-term benefits of the project, including improved public transport provision for passengers and freight and associated reduced emissions and enhanced accessibility. The region is experiencing major growth in tourism and industrial development. Without strong planning regulation, the valuable natural resources in the area will come under increasing pressure.

LAND ACQUISITION AND RESETTLEMENT

A. Introduction

1. The Dali–Lijiang Railway (DLR) is a class I single-track standard gauge railway with a length of 167 kilometers (km) built between Dali and Lijiang. Eleven new fully equipped railway stations were also completed. Civil work for the whole railway line was divided into 11 bid sections. The key parts of the DLR civil works started in June 2005. The period from 2005 to 2006 was the peak period for the construction of bridges, tunnels, and subgrades, as well as for land acquisition, demolition, relocation, and resettlement. On 28 September 2009, the DLR was officially put into operation.

B. Scope of Land Acquisition and Resettlement

2. The project passes through 12 towns including 58 administrative villages. Compared with 5,913 *mu* (394.2 hectares [ha]) of planned land acquisition, 6,228.7 *mu* (415.2 ha) of land was permanently acquired.[1] About 75% of the affected persons were ethnic minorities (mainly Bai in Dali city and Heqing county and mainly Naxi in Gucheng district). A total of 554 houses were demolished, affecting 2,641 people compared to planned demolition of 680 houses with 3,150 people. The permanent land acquisition was 6229 *mu* (415.2 ha), 5% higher than the planned amount of 5,913 *mu* (394.2 ha); however, the amount of cultivated land acquired decreased from 4,159 *mu* to 2,565 *mu*. The actual number of affected persons was 45,280, which means the average farmland loss was 0.057 *mu* (or about 6% loss); however, a few villages and about 1,000 households did suffer significant farmland loss. The actual temporary land occupation of 3,567.1 *mu* (237.8 ha) was more than double the planned occupation of 1,600 *mu* (106.7 ha). In addition, four schools were relocated compared to the planned relocation of one school, and 14 enterprises were relocated compared to planned relocation of one enterprise. Various small enterprises were found to be affected when the detailed measurement survey was completed. Table A.16.1 presents a comparison between planned and actual land acquisition and resettlement (LAR) activities. The appraisal figures are estimated figures as outlined in the resettlement plan, while the actual figures come from the resettlement completion reports submitted by the West Yunnan Railway Company (WYRC) and the external monitor.

[1] A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 square meters).

Table A16.1: Land Acquisition and Resettlement Impacts

Item		Unit	Planned	Actual	Difference	% Change
1.	Permanent land acquisition	*mu*	5,913	6,229	316	5.3%
	- of which cultivated land	*mu*	4,159	2,565	(1,594)	(38.3%)
	People affected by permanent land acquisition*	persons	4,159	45,280	41,575	See note
2.	Temporary land occupied	*mu*	1,600	3,369	1,769	110.0%
3.	Demolished private houses	households	680	554	(126)	(18.5%)
	Persons affected by house demolition	persons	3,105	2,641	(464)	(14.9%)
	Housing area demolished	m^2	120,314	140,866	20,552	17.1%
4.	Demolished schools/enterprises	unit	2	18	16	800.0%
	Building area demolished	m^2	594	17,700	17,106	2,880.0%

( ) = negative, m^2 = square meter.

Notes: The land acquisition and resettlement figures provided in external monitoring reports are based on detailed measurement survey.

A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 m^2).

* The appraisal estimated that the equivalent of 4,159 people would have total farmland loss (assuming 1.0 *mu* per person), but this figure was meant to assess the relative impact of farmland losses. In reality, the average degree of loss was expected to be about 3% at the village level (58 villages in total) and about 15% at the household level (i.e., at least 28,000 people). The actual number of affected persons includes about 15,000 villagers in the nine affected villages in Gucheng district which readjusted remaining lands to ensure that the people's agriculture-based livelihoods were not adversely affected and land compensation was distributed among the villagers, treating them all as affected by permanent land acquisition.

3. The resettlement plan was prepared by the Foreign Capital and Technical Import Center of the Ministry of Railways and the WYRC to deal with LAR impacts. The resettlement plan was submitted to ADB in September 2004. The main objective of the plan was to ensure that the living standards of people affected by LAR are at least equal to, or better than, before the project. The WYRC as the project executing agency was responsible for coordinating and supervising implementation of the resettlement plan and established a LAR unit with five staff. Each affected prefecture and affected district and county also established LAR working offices. LAR activities for the project started in November 2004 and were completed by July 2009.

C. Resettlement Plan and Compensation Rates

4. The resettlement plan was prepared according to the laws of the PRC and provincial and local laws and ADB's Involuntary Resettlement Policy (1995). The external monitoring reports indicate that the resettlement plan implementation followed these policy requirements. The compensation rates for land acquisition were fixed on the basis of multiples of the average annual output value of the land in the 3 years prior to the acquisition. Compensation for permanent land acquisition included two methods: (i) in Dali city and Heqing county, cash compensation was directly given to the affected farmers, and the village farmland was not readjusted; and (ii) in Gucheng district of Lijiang city, village land was readjusted following land acquisition and compensation was distributed to all of the farming households in the affected villages.

5. External monitoring reports indicate that the residential land, houses, buildings, and loss of fixtures were paid at replacement cost, directly to the affected persons. The houses were evaluated by an intermediate company, evaluation results were publicly discussed and, once accepted by affected persons, house dismantling agreements were signed by relevant parties. In the majority of cases, village committees provided housing plots to the affected persons at a single location, in a concentrated manner to ensure that the community character remains intact. For these resettlement sites, the government provided water, electricity, and roads.

However, for the affected persons who chose to build their houses separately, provision of water, electricity, and road access was delayed in some cases.

6. For people affected by house demolition, a transitional subsidy was planned for a period of 6 months. The executing agency disclosed that the transitional subsidy was actually paid for a period of 10 months.[2] However, the external monitor reports indicate that the transitional period was long, in some cases up to 18 months.

7. As Table A16.2 indicates, actual compensation rates were higher than the planned ones. The external monitoring reports indicate that the affected persons were satisfied with the compensation.

Table A16.2: Compensation Rates for Permanent Land Acquisition, Buildings and Structures, and Infrastructure Relocation

(CNY)

Item	Unit	Resettlement Plan Rate	Actual Rate	Variation (%)
A Land Acquired				
Permanent				
Irrigated	mu	12,960	15,840–20,000	22.2–54.3
Dry land	mu	7,092	3,000*–10,000	(57.7)–41.0
Shrubbery	mu	1,039	1,300–4,000	25.1–285.0
Waste land	mu	300	300	0
Housing land	mu	12,960	22,000	69.8
Temporary	mu	2,000	2000	0
B Buildings and Structures				
Frame	square meter		700	
Brick-concrete structure	square meter	300	480–620	60.0–106.7
Simple structure	square meter	180	170–400	(5.6)–122.2
Brick fence wall	m	150	200	33.3
Earth fence wall	m	35	50	42.9
Tomb	unit	200	400–1,000	100.0–400.0
Well for drinking water	unit	200	150–3,000	(25.0)–1,400.0

* One township in Heqing reportedly deducted CNY7,000/*mu* in land fees from the compensation. (A *mu* is a Chinese unit of measurement [1 *mu* = 666.67 square meters]).

Source: West Yunnan Railway Company and Monitoring Agency.

D. Rehabilitation and Resettlement Measures and Income Restoration

8. Based on public consultation and opinion, village land readjustment following permanent land acquisition was a preferred option in Gucheng district. Accordingly, village land was readjusted to ensure that the affected farmers did not suffer from a significant loss of farmland. Apart from compensation, the government also paid the premium for land loss insurance. In all cases, compensation was adequate to offset any loss of income.

9. Training was provided by the local governments through human resources training centers and the affected persons were given preference in various training programs. The training was voluntary, based on the affected people's choice to participate and was provided free of charge. Women also participated in the training programs based on their preference for the programs offered and were given preference.

10. During the construction period, local people also benefitted from construction-related employment. The project targeted local communities, especially poor, ethnic minorities, and

[2] Consultation with executing agency during the project completion mission.

women for the unskilled work generated during the project construction. The WYRC reported that construction activities generated 35,952 person-years of unskilled labor (41%), of which 19,773 person-years (55%) of unskilled labor were hired from the local labor market. Use of local materials and resources also benefitted the local people. The project used local material such as sand, stone, and rocks as well as local produce and resources such as rental spaces. The project has also facilitated tourism in the area. For example, in Lijiang, 25,000 tourists arrivals were recorded in 2009, and this rose to 480,000 in 2010.[3] The local economy will continue to benefit from tourism development and it will result in new avenues of income generation such as catering services and rise in sale of local products such as metalwork and ornaments.

11. The resettlement completion report indicates a general rise in the income of the affected households. For example, the per capita income for affected persons in Dali city was CNY2238 in 2004, and this rose to CNY4,210 in 2008. There are similar cases for the Development Zone, where per capita incomes during 2004–2008 rose by 45%, and Heqing county, where per capita incomes during 2004–2008 rose by 82%. Only in Gucheng district has the change been less significant, with per capita income rising by about 18% during 2004–2008.

12. Within the project area, poverty incidence in some places was high. For example, Heqing county is a poverty county. The project developed and implemented some specific strategies to ensure that poor and vulnerable households also benefit from the project and their living standards improve. The special measures include disbursement of living allowances, skill training, provision of minimum size house plots, and cash grants for extremely poor households.[4] The project completion report from the external monitor indicates that such low-income and vulnerable households were usually satisfied with their resettlement.

13. The project also compensated the affected enterprises. The project resulted in relocation of 14 enterprises caused by demolition of 15,700 square meters (m^2) of structures. A total of CNY16.71 million was paid as compensation. During the process, the involved enterprises were actively consulted. A number of methods were used to determine the dismantling scheme and to assist the enterprises to recover production. Four schools were also affected by the project, and all have been relocated. In the case of the Dali No. 3 school there were some delays due to insufficient funds. The school has finally been rebuilt, although it is quite far from the original school site, but this would not cause major issues as it is a boarding school for students coming from rural areas.[5]

E. Land Acquisition and Resettlement Cost

14. Total actual cost of resettlement (CNY246.06 million) is higher than the original estimated budget of CNY141.00 million. This increase is mainly due to the higher compensation rates paid for both permanent land acquisition and house relocation. While the appraisal budget for land acquisition was CNY49.7 million, the actual budgetary requirements were CNY108.0 million. For house demolition, the appraisal budget was CNY36.1 million, while the actual cost was CNY71.1 million. As per the external monitoring reports, all compensation was provided in full and to the satisfaction of the affected persons. The WYRC provided the counterpart funding for land acquisition and relocation. The project witnessed some funding problems, especially at the local government level to meet the resettlement requirements. For

[3] Data provided by the executing agency during the project completion mission.
[4] External Monitors Resettlement Completion Report, December 2009.
[5] Details provided by the WYRC during the project completion mission.

example, the Dali No. 3 school relocation was delayed because of insufficient funds at the local government level.[6] However, the local government was able to raise funds through financial grants and business tax on project construction.

F. Information Disclosure, Consultation and Participation, and Grievance Redress

15. Affected households were informed about land acquisition and resettlement impacts, entitlements, and policies through multiple channels including local radio, newspaper, and television. Government actions included making people aware of the significance of the rail project, compensation standards, and other measures for livelihood restoration. Village leaders held meetings about the LAR impacts and standards of compensation, introduced the policy measures, and distributed information booklets to people affected by LAR. Mass meetings were held at the village level, and the implementing authority visited each household affected by land acquisition and relocation. During the meetings, affected people could ask questions and raise their concerns.[7]

16. A grievance redress mechanism was set up in accordance with the resettlement plan to deal with project-related grievances of affected persons. Functioning of this mechanism was supervised by the PMO, local government offices, and Kunming Railway Administration Bureau. The grievances received mainly related to construction-related disturbances such as noise pollution, damage to water and irrigation facilities, and cracks and damage to houses resulting from blasting. The WYRC informed that such grievances were resolved in a timely manner and there are no outstanding issues.[8]

G. Institutional Arrangement

17. The WYRC established a relocation and resettlement office that was responsible for land acquisition and relocation activities. Responsibilities for effective implementation of LAR were delegated to the various levels that consisted of officials from the railways and the local government authorities.

H. Monitoring and Evaluation

18. Both internal and external monitoring was undertaken. The PMO prepared quarterly internal progress reports and submitted these as part of its quarterly reports to ADB. The external monitoring agency completed a baseline survey consisting of 202 households in November 2005. The external monitor submitted eight reports between 2006 and 2010—three in 2006; two in 2007; and one each in 2008, 2009, and 2010. The quality of these reports could have been improved by provision of information in a more systematic and organized manner and by explicitly addressing data gaps that had been identified. The external monitor also submitted the resettlement completion report in 2010.

I. Issues and Solutions

19. Based on review of external monitoring reports, some resettlement-related issues became apparent. Most of these are construction related such as damage to water resources

[6] Information provided by the WYRC during the project completion mission. The compensation amount was made available on time but the local government wanted to build a larger school to higher standards.
[7] External Monitoring Reports.
[8] Information provided by the WYRC during the project completion mission.

and facilities and damage to the houses due to blasting. Other issues directly related to resettlement are compensation for fragmented and scattered land, impact on educational facilities, long transition period, insufficient support funds from local government, some affected families could not negotiate the resettlement, and longer than stipulated occupation of temporary land.

20. These issues were discussed with the officials from the executing agency during the project completion mission. The PMO explained the efforts that were made to deal with these issues. For example, for the houses damaged by blasting, simple damage was immediately repaired but, where damage was significant, an independent housing evaluation agency made an assessment and an agreement was signed with the house owner to ensure the proper repair or relocation of the affected house.

J. Lessons Learned

21. During consultations with the WYRC, it became apparent that the project provided the WYRC with a good opportunity to learn about resettlement processes in general and ADB requirements in particular. The main lesson learned was that quality consultation with and participation of affected persons is a key. People should be informed about their entitlements, programs for their rehabilitation, and the benefits they will derive from the project. Another important lesson learned was about “keeping promises”, i.e., the quality of resettlement work should be evident on the ground. Publicizing and ensuring affected persons learn about cut-off dates was another important lesson learned; in this case, a few affected households constructed structures after the cut-off date, and this caused delays in signing resettlement contracts.

22. ADB support to the project was crucial and its good supervision was helpful in implementation of the resettlement plan, including livelihood restoration programs. ADB could have strengthened its role by fielding review missions on an annual basis to provide guidance during resettlement plan implementation.

K. Case Study

23. **Case study of He Ru Qiang family in Hua Jeng village, Heng township.** The Qiang family house was demolished in July 2005. It was an earth–wood house of 200 m^2. The family constructed the new house on its own, and it took almost 12 months to complete—the house was completed in June 2006.The new house is a brick–wood structure covering 420 m^2. During the transition period, the family built a temporary house in its own land and received a transition fee of CNY3,500. He Ru Qiang, the head of the household, also worked part time with the project mixing material, cutting stones, and transporting construction material using his own tractor. His son received training on driving heavy vehicles. The family did not lose much agricultural land as a result of the land readjustment program. The family now runs its own business selling fruit and meat, and has a 2 *mu* peach orchard. The family also grows rice, potatoes, and other vegetables, and feels better off with improved economic conditions. The family’s living conditions have also improved, and it has no complaints about compensation and resettlement. The railway has made travel more convenient and affordable, and He Ru Qiang and his family can travel more as rail prices are cheaper than the buses. In the past, He Ru Qiang had been only to Dali. Since the railway opened, he and his wife have visited Kunming as tourists.

L. Conclusion

24. The monitoring and evaluation reports and consultations with the project staff during the project completion mission indicate that the affected persons have been compensated for land and house losses. Compensation was paid prior to land acquisition and house demolition. The compensation standards were generally higher than appraisal standards both for house demolition and permanent land acquisition. The monitoring and evaluation reports point to improvements in the incomes and living standards of the affected persons. For example, the predisplacement average household area for affected persons in Dali was 285 m^2, of which only 67 m^2 was brick–concrete type. Following relocation, the average household area now is about 320 m^2, of which 291 m^2 is brick–concrete type. Consultations with some of the affected families also endorsed the fact that they have been adequately resettled. Measures to restore affected persons' livelihoods were undertaken, including provision of training and skill enhancement. The WYRC explained that people's project-related grievances were met within reasonable time and to the satisfaction of the aggrieved party.

EVALUATION OF THE ETHNIC MINORITIES DEVELOPMENT PLAN

A. Introduction

1. The 167 kilometer (km) Dali–Lijiang Railway (DLR) traverses three mountainous countries in Yunnan with a high ethnic minority population. The project area included Dali county and Heqing county in Dali Bai autonomous prefecture and Lijiang county-level city. In 2003, about 73% of the 1.1 million people in the project area were ethnic minorities: Bai (46.2%), Lisu (2.8%), Naxi (18.3%), and Yi (3.2%). By 2010, the population had grown to 1.34 million. The boundaries of analysis (BOA)[1] for the project included seven counties: Eryuan, Jianchuan, Lanping, Ninglang, Weixi, Xianggelila (formerly Zhongdian), Yongsheng, . The BOA has another 1.7 million people and 70% are ethnic minorities, including Bai (30.7%), Lisu (13.4%), Naxi (3.7%), Pumi (1.7%), Tibetan (4.4), and Yi (13.6%).

2. Based on the high potential for positive or negative and direct or indirect impacts on ethnic minorities in the project area, the Asian Development Bank (ADB) classified the project as category A for indigenous peoples. An ethnic minorities development plan (EMDP) was prepared to improve the socioeconomic conditions of ethnic minorities and ensure compliance with the ADB Indigenous Peoples Policy (1998). The EMDP was prepared jointly by the Ministry of Railways (MOR), the Planning Commission of Dali Prefecture, the Dali-Lijiang Railways Supporting Lead Office of Lijiang City, and the West Yunnan Railway Company (WYRC). The budget for the EMDP actions was included in the civil works costs, the resettlement plan budget, the environmental impact assessment (EIA) budget employment on project-related activities, and local government development budgets. ADB also provided a $150,000 technical assistance grant.

3. The WYRC was the executing agency for the project with overall responsibility for the EMDP implementation. The Yunnan Ethnic Affairs Commission (YEAC) was responsible for review and oversight of the EMDP and its implementation; it reviewed the external monitoring reporting and provided recommendations to the WYRC. The WYRC also worked closely with the local governments in Dali, Lijiang, and Heqing and their relevant agencies to implement the project and the EMDP actions, particularly the enhancement measures from complementary programs. The WYRC engaged the Yunnan Nationalities Museum as the external monitor for the EMDP implementation from 2005 to 2009.

B. Objectives

4. The high proportion of ethnic minorities in the project area, coupled with linking Dali and Lijiang (historic towns with strong ethnic cultural traditions) for economic development, triggered the need for extensive consultations and careful consideration of ethnic minorities in project design. In particular, the rapid increase in tourism was generally considered economically beneficial, but adverse sociocultural and environmental issues often arise. When tourist attractions are developed on a commercial basis, many of the benefits can go to outsiders; furthermore, the quality and rapid pace of tourism development can undermine the distinct cultures of ethnic minorities. This was recognized as a social risk and awareness within local government increased during EMDP implementation, but there are many external factors promoting tourist growth both prior to and during the period of project construction and operation,

[1] The boundaries of analysis are the neighboring counties to the project area for which a social due diligence study was completed in order to evaluate any impacts beyond the project area and identify any issues that may arise. This was explicitly requested by ADB Management to address concerns raised by an international Tibetan nongovernment organization.

which are beyond the control of the WYRC. This was the reason for the joint preparation of the EMDP.

5. The goals of the EMDP were identified as follows: (i) ensure equitable sharing of project benefits, (ii) address adverse effects of the project on ethnic minorities, and (iii) increase participation of ethnic minorities in project implementation and operation.

C. Project Benefits and Impacts

6. Potential project benefits and impacts were identified through (i) collection of primary and secondary socioeconomic data; (ii) collection of information on ongoing and planned government programs addressing ethnic minorities' development needs and concerns in the railway corridor; (iii) interviews with key informants in the government and village committees; (iv) review of recommended actions in the resettlement plan; (v) brainstorming with key informants, ethnic minorities, and government officials; and (vi) a consultative workshop on safeguard issues held in Dali in 2004.

7. These extensive consultations led to consensus on the potential social benefits and risks for ethnic minorities. The project benefits included (i) higher income from increased cash-crop farming, (ii) more cash income sources due to seasonal migration work and tourism opportunities, (iii) improved communication with urban centers and better access to markets and social services, and (iv) improved access to local facilities and services through handover of construction access roads to the community after completion of railway construction. The project social risks included (i) weakening of ethnic minority culture from greater interaction with tourists and outsiders, (ii) exposure to infectious diseases and drug use, (iii) land acquisition and resettlement, (iv) destruction or deterioration of cultural sites and relics, (v) competition for employment, and (vi) increased economic development leading to higher cost of living.

8. Analysis of the potential benefits and risks resulted in the mapping of (i) direct benefits to be monitored or enhanced to ensure inclusiveness, (ii) adverse impacts which needed mitigation measures (fully the responsibility of the WYRC), (iii) indirect enhancement measures that local government had committed to implement, and (iv) cultural preservation measures (with grant support from ADB). These potential benefits and impacts formed the basis of the specific activities identified in the EMDP.

9. In 2004, Tibetan nongovernment organizations expressed a concern that the railway would be extended to Xizang. The Ministry of Railways had a long-term plan to extend the railway to Lhasa, but this would be a very technically challenging and costly investment. In the shorter term, there had been discussions about extending the line north by about 139 km to Xianggelila. Consequently, prior to loan approval, the analysis of social and environment impacts was broadened to include the BOA. Those investigations and consultations revealed that local people were very supportive of the railway as those counties are very isolated and poor. Many Tibetans were interviewed, primarily in Xianggelila where 43% of people are Tibetan; they also supported the railway project, although there were concerns about the economic development impacts on their culture, which had already been evident due to improvements in roads, air travel, and tourism development. It was concluded that these impacts would continue with or without the railway extension.

D. Ethnic Minorities Development Plan Implementation and Achievements

10. The EMDP was implemented throughout the project construction phase from 2005 to 2009. Table A17.1 shows the specific actions included in the EMDP and the notable achievements attained by the end of the project.

Table A17.1: Summary of Ethnic Minorities Development Plan Actions and Achievements

Proposed Actions	Achievements
1. Direct Benefits	
Improved access to transport and rail services	About 20% of passengers are ethnic minorities (the rest being tourists or business people from outside), as the railway provides a lower cost and safer transport option. 139 km of paved construction access roads and 29.9 km of paved station connecting roads (for 11 stations) were financed under the project.
Station area development and related business employment	Lijiang and Heqing stations were located away from the city and town centers to reduce resettlement impacts. Heqing station is quite isolated, at 4.8 km from the county center. A building containing food and beverage and handicraft stalls is located about 200 m from the station.
Employment for unskilled construction work (equal opportunities for women for work/pay)	19,773 person-years unskilled labor (22% of total labor) from local market (78% ethnic minorities and 10% women). Average daily wages: men (CNY40–CNY80) and women (CNY20–CNY50).
Employment for train-related services	365 people employed by WYRC for operation; 91 (25.5%) are ethnic minorities and 105 (29.5%) are women.
Supply of local materials and services to railway construction	CNY705 million invested in local economy. 157 units provided catering services and employed 1,256 persons.
Tourism development related to railway	Tourism revenue in the project area increase from CNY5.9 billion in 2004 to CNY23 billion in 2011; the most significant increase was in Heqing. Lijiang station has a tourist information office that has booklets and maps of the area showing attractions. Direction signs for train station are in Mandarin and Naxi languages.
2. Mitigation Measures	
Protection of ethnic minority villages from construction disturbances	Noisy construction activities were restricted to daytime hours 271 km of paved pedestrian paths were constructed during 2005–2009, some land was restored to cultivated land after construction. CNY8,552,000 invested in repair of irrigation/drainage canals. In 2005, 94 houses in Haiyin village were damaged from blasting activities and complaints were made about disturbance from noise and dust levels during construction of Haiyin tunnel. Affected households were compensated by the contractor. During construction of the railway, nearby roads were surveyed for damage and repaired.
Awareness and prevention of HIV/AIDS	Regular training on health and awareness/prevention of HIV/AIDS by local government and the contractors Each section of civil works had a clinic (total: 11). No new cases of HIV reported among construction workers
Awareness on cultural habits and heritage protection	Cultural training provided to construction workers on Bai culture (1,100 participants) and Naxi culture (3,000 participants)
Income recovery for resettlement affected people impacted by loss of farmland	98,221 places in training programs were filled by affected persons, most of whom were ethnic minorities. Compared to the Bai, the Naxi elected to readjust the remaining farmland amongst all villagers.
Preferential treatment to be given to vulnerable groups affected by resettlement	125 people and/or households received support from local government and/or village cadres, mostly Bai and Naxi
Awareness program on the impact of public safety and railway operations	Train conductors are trained in safety and procedures in case of accidents. At least one poster on safety procedures is posted in each

Proposed Actions	Achievements
	carriage. The track is fenced to prevent accidents and all pedestrian crossings are underpasses.
E. Enhancement Measures (indirect)	
Afforestation	4,013,500 trees (237,335 *mu*) planted including economic trees (walnut, pear, peach) About 489,901 people (467,812 ethnic minorities) in the project area benefited from afforestation activities and increased incomes
Monitoring of ongoing government poverty reduction interventions	Interventions including road upgrading, ecological restoration around Erhai Lake, irrigation facilities, and rural cooperative medical system were implemented by 2012
Monitoring of ongoing government pro-poor rural roads program	260 km of roads were constructed by local government which improved access to poor rural villages.
Tourism-related training in sustainable tourism development	The tourism bureau provided tourism training in the project area. In 2009, tourism training was provided to 8,776 people, most of whom were ethnic minorities.
F. Cultural Preservation Measures	
Preserve cultural heritage and monitor induced impacts	The ADB technical assistance promoted living cultures; training on ethnic arts; and restoration, preservation, and protection of cultural relics. The pilot projects contributed to increased awareness amongst local people and government officials of their cultural heritage, protection of tangible and intangible cultural heritage, and increased quality of cultural tourism.
Pilot implementation of community-based tourism	Not implemented, as funding for this pilot was not forthcoming. However, separate similar initiatives have been undertaken by the private sector.

CNY = Yuan, km = kilometer.
Source: West Yunnan Railway Company and Monitoring Agency.

11. Overall, the EMDP was satisfactorily implemented. All of the actions funded directly by the project, those categorized as direct benefits and mitigation measures, were implemented in a timely manner and generally well documented. Some data was not disaggregated to represent differences between (i) men and women; (ii) poor, local, and ethnic minorities; or (iii) ethnic minority groups. The main direct adverse impact of the project on ethnic minorities was land acquisition and resettlement (Appendix 16).

12. Regarding construction impacts, the MOR was already experienced with health and safety requirements, including HIV/AIDS prevention, and they ensured that contractors implemented a tightly controlled construction camp culture. It was reported that generally contractors and villagers had a good relationship, with many contractors respecting the cultural beliefs and heritage of those villagers and even participating in celebrations. However, at least one contractor had a poor relationship with the local village, but this was remedied after intervention from the local government.

13. The implementation of local government programs was less well documented but these were complementary to the project and helped spur local development of rural areas. There was little information about the tourism-related training in sustainable tourism development. This action should have been followed up with the local tourism bureaus, as the responsibility rested with local government. Discussions with local leaders indicated there is increased awareness of this concern but there appeared to be no specific plan of action.

14. Cultural preservation measures were designed to mitigate sociocultural risks associated with tourism promotion. ADB provided $150,000 of technical assistance (paras. 16–18).

15. Construction of the railway extension to Xianggelila will commence in 2013 and be completed in 2018. Based on the EMDP experience gained from the project, the WYRC has paid greater attention to project planning through greater consultation with local communities. This has resulted in improved project design and alignment to reduce social and environmental impacts. Further actions will be required by local government to address the induced economic development impacts, and relevant lessons can now be drawn from the DLR.

E. ADB Technical Assistance for Ethnic Minority Development

16. ADB provided a $150,000 technical assistance grant[2] for Support to Ethnic Minorities Development Plan for the Dali–Lijiang Railway Project to enhance the project benefits for the ethnic minorities and assist in developing feasibility studies for the preservation of local culture in the project area and BOA. The TA focused exclusively on cultural protection rather than on other aspects of socioeconomic development, including tourism, so as to mitigate potential impacts on local cultural traditions from the inflow of large numbers of tourists.

17. The TA outputs included (i) increased awareness of ethnic minority cultural issues within local governments, (ii) successful small pilot programs that achieved significant benefits, and (iii) a strategic plan for intangible cultural heritage protection and development. The TA was implemented by the Yunnan Nationalities University, in close coordination with the YEAC, from May 2007 to July 2008 and produced a summary report in Chinese that was disseminated to more than 1,000 local government offices in Yunnan.

18. Five pilot training programs were implemented for ethnic cultural protection: (i) Baiyi *suona* music in Liuhe township; (ii) preservation of ancient books in Heqing Library; (iii) Dianbei Tiangeng and Xishan singing in Heqing county; (iv) Dongba practitioners in Lijiang Institute of Dongba Culture; and (v) protection and transmission of Miaohui culture in Huiwen village, Jianchuan county. Two of these programs—(i) and (ii)—continued after completion of the TA, both in Heqing county, an area previously underfunded for cultural protection and enhancement. These have contributed to increased awareness amongst local people and government officials of their cultural heritage, protection of tangible and intangible cultural heritage, and increased quality of cultural tourism.

F. Monitoring and Evaluation

19. The Yunnan Nationalities Museum was contracted as the external monitor to review and report on specific activities in the EMDP. ADB received five annual monitoring reports for ethnic minorities development from 2005 to 2010. All of these reports have been disclosed on the ADB website. However, ADB did not receive a completion report for ethnic minorities development from the WYRC, so further assessment was needed as part of the project completion mission in late 2012.

20. The external monitor reported mainly on implementation of the actions funded by the project and less on actions funded by local government. The monitoring reports were largely anecdotal and lacking in data and analysis which may have been improved through more supervision from ADB and/or with more appropriate and measurable indicators that would have guided more specific monitoring. A local institute was contracted to ensure that the local context was well understood, but it did not have experience with ADB monitoring requirements.

[2] ADB. 2004. *Technical Assistance to the People's Republic of China for Preparing the Support to Ethnic Minority Development Plan*. Manila.

G. Lessons Learned

21. This EMDP was the first one prepared for a railway project in the PRC. Previously, the MOR had collected some data on social and poverty benefits for projects with ADB financing. The ethnic minorities requirements for this project provided a new challenge, especially for the WYRC and local government. With support from the YEAC, ADB, the external monitor, and the TA consultant, implementation of the EMDP was eventually achieved; however, there were some lessons learned:

(i) While much of the data collected was disaggregated at least by gender, it would be have been more informative if the data was also disaggregated by ethnic minority group (despite the fact that 80% of affected persons were ethnic minorities, each group has unique characteristics).

(ii) Greater ADB supervision of the external monitor was required because even though it was very experienced in local cultures, it was not familiar with ADB policy and reporting requirements.

(iii) Large infrastructure projects in the PRC need to be considered in the context of rapid economic development. The DLR represented less than 10% of the investment in the local area, so it is difficult to attribute social benefits and risks to one project. Nonetheless, this EMDP served as a good example of how to integrate or address social concerns on projects. These lessons have been incorporated into development strategies formulated under the regional TA on Capacity Building for Indigenous Peoples Mainstreaming. This has helped the YEAC and Yunnan provincial government to consider social aspects of proposed infrastructure developments in its ethnically diverse province.

(iv) The pilot projects implemented under the attached TA proved that significant sociocultural enhancements can be made with small investments, and the opportunities in Yunnan are numerous. These were very important to the local people, and helped promote cultural tourism. However, the question of responsibility is still debated; in the PRC, this is primarily the responsibility of the cultural affairs bureau rather than of project developers.

H. Conclusion

22. Overall, the EMDP implementation was able to meet its goals with respect to the WYRC's project responsibilities. The adverse construction impacts caused by the project were either reduced or adequately mitigated in culturally appropriate ways, especially for land acquisition and resettlement. The project benefits were significant and inclusive of the rural people in the project area and BOA, who are predominantly ethnic minorities. There is ongoing concern about the long-term social and cultural consequences of rapid economic development in the project area. This development had commenced before the project, so the incremental impacts were not as significant as anticipated, although there is definitely a cumulative impact. The EMDP implementation was very relevant and effective as it served to increase awareness within the WYRC and local governments of the need to protect the unique environmental and cultural resources of the area, and find a better balance between the need for local economic and natural resource development (which is essential for local employment generation) and poverty reduction. This should be reflected in subsequent 5-year plans.