

ASIAN DEVELOPMENT BANK

PCR:PRC 30066

PROJECT COMPLETION REPORT

ON THE

GUIZHOU SHUIBAI RAILWAY PROJECT
(Loan 1626-PRC)

IN THE

PEOPLE'S REPUBLIC OF CHINA

August 2005

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal	At Project Completion
		1 July 1998	11 April 2005
CNY1.00	=	\$0.12	\$0.12
\$1.00	=	CNY8.28	CNY8.28

ABBREVIATIONS

CRAB	–	Chengdu Railway Administration Bureau
EA	–	executing agency
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
GDIES	–	Guizhou Designing Institute of Environmental Sciences
GNP	–	gross national product
GSRC	–	Guizhou Shuibai Railway Corporation
GSSA	–	Guizhou Social Sciences Academy
ITC	–	China International Tendering Company
KRAB	–	Kunming Railway Administration Bureau
LMG	–	Liupanshui municipal government
MCI	–	Ministry of Coal Industry
MOR	–	Ministry of Railways
OECF	–	Overseas Economic Cooperation Fund
PMO	–	project management office
PRC	–	People's Republic of China
SDB	–	State Development Bank
TA	–	technical assistance

WEIGHTS AND MEASURES

ha	–	hectare
kg	–	kilogram
km	–	kilometer
km ²	–	square kilometer
m	–	meter
m ²	–	square meter
mtpa	–	million tons per annum

NOTE

In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1. Country	People's Republic of China (PRC)
2. Loan Number	1626-PRC
3. Project Title	Guizhou Shuibai Railway Project
4. Borrower	People's Republic of China
5. Executing Agency	Guizhou Shuibai Railway Corporation
6. Amount of Loan	\$105.0 million
7. PCR Number	PCR: PRC 893

B. Loan Data

1. Appraisal	
- Date Started	17 February 1998
- Date Completed	3 March 1998
2. Loan Negotiations	
- Date Started	29 June 1998
- Date Completed	1 July 1998
3. Date of Board Approval	18 August 1998
4. Date of Loan Agreement	23 February 1999
5. Date of Loan Effectiveness	
- In Loan Agreement	24 May 1999
- Actual	24 May 1999
- Number of Extensions	None
6. Closing Date	
- In Loan Agreement	30 June 2003
- Actual	15 March 2004
- Number of Extensions	1
7. Terms of Loan	
- Interest Rate	Pool-based variable lending rate for US dollars
- Maturity (number of years)	25
- Grace Period (number of years)	5
8. Terms of Relending	
- Interest Rate	Pool-based variable lending rate for US dollars
- Maturity (number of years)	25
- Grace Period (number of years)	5
- Second-Step Borrower	Guizhou Shuibai Railway Corporation

9. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
31 August 1999	15 March 2004	54.5 months

Effective Date	Original Closing Date	Time Interval
24 May 1999	30 June 2003	49 months

b. Amount (\$)

Category or Subloan	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
Civil Works	67,500,000	59,965,626	7,534,374	59,965,626	59,965,626	0
Signaling, Telecoms, Electrification	6,100,000	2,701,918	3,398,082	2,701,918	2,701,918	0
Materials	32,000,000	26,685,882	5,314,118	26,685,882	26,685,882	0
Admin, Consulting Services, and Miscellaneous	400,000	399,607	393	399,607	399,607	0
IDC	17,400,000	15,246,967	2,153,033	15,246,967	15,246,967	0
Unallocated	16,600,000	0	16,600,000	0	0	0
Total	140,000,000	105,000,000	35,000,000	105,000,000	105,000,000	0

IDC = interest during construction.

10. Local Costs (ADB-Financed)

- Amount (\$)	0
- Percentage of Local Costs	0
- Percentage of Total Costs	0

C. Project Data

1. Project Cost (\$ million)

Item	Appraisal Estimate	Actual
Foreign Exchange Cost	170.1	165.6
Local Currency Cost	210.9	227.0
Total Cost	381.0	392.6

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	159.6	199.5
ADB Financed	122.6	89.7
Other External Financing	72.3	72.6
Subtotal	354.5	361.8
IDC Costs		
Borrower Financed	9.1	15.5
ADB Financed	17.4	15.3
Other External Financing	0.0	0.0
Total	381.0	392.6

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

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

Item	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
(a) Railway – Civil Works	104.4	110.6	215.0	116.0	122.9	238.9
(b) Railway – Trackwork	14.2	22.7	36.9	17.7	28.4	46.1
(c) Buildings and Facilities	1.5	6.2	7.7	0.8	3.4	4.2
(d) Signaling, Telecom, Elec and Operating Eqpt	13.5	18.4	31.9	15.4	20.9	36.3
(e) Land Acquisition and Resettlement		4.4	4.4	0.0	8.7	8.7
(f) Admin, Consulting Services, and Miscellaneous Costs	0.4	15.4	15.8	0.4	27.2	27.6
(g) IDC	17.4	9.1	26.5	15.3	15.5	30.8
(h) Unallocated	18.7	24.1	42.8	0.0	0.0	0.0
Total	170.1	210.9	381.0	165.6	227.0	392.6

IDC = interest during construction.

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	August 1998	July 2002
Completion of Engineering Design	December 1999	October 2002
Civil Works Contract		
Date of Award	May 1999	December 1998
Completion of Work	December 2002	January 2002
Equipment and Supplies		
First Procurement	June 1999	June 1999
Last Procurement	June 2000	December 2001
Start of Operations		
Completion of Installation	October 2002	September 2002
Beginning of Start-Up	November 2002	January 2005

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
(i) From Jan 1999 to Apr 1999	S	U
(ii) From May 1999 to Dec 1999	S	S
(iii) From Jan 2000 to Dec 2000	S	HS
(iv) From Jan 2001 to Dec 2001	S	HS
(v) From Jan 2002 to Dec 2002	S	S
(vi) From Jan 2003 to Dec 2003	S	HS
(vii) From Jan 2004 to Oct 2004	S	HS

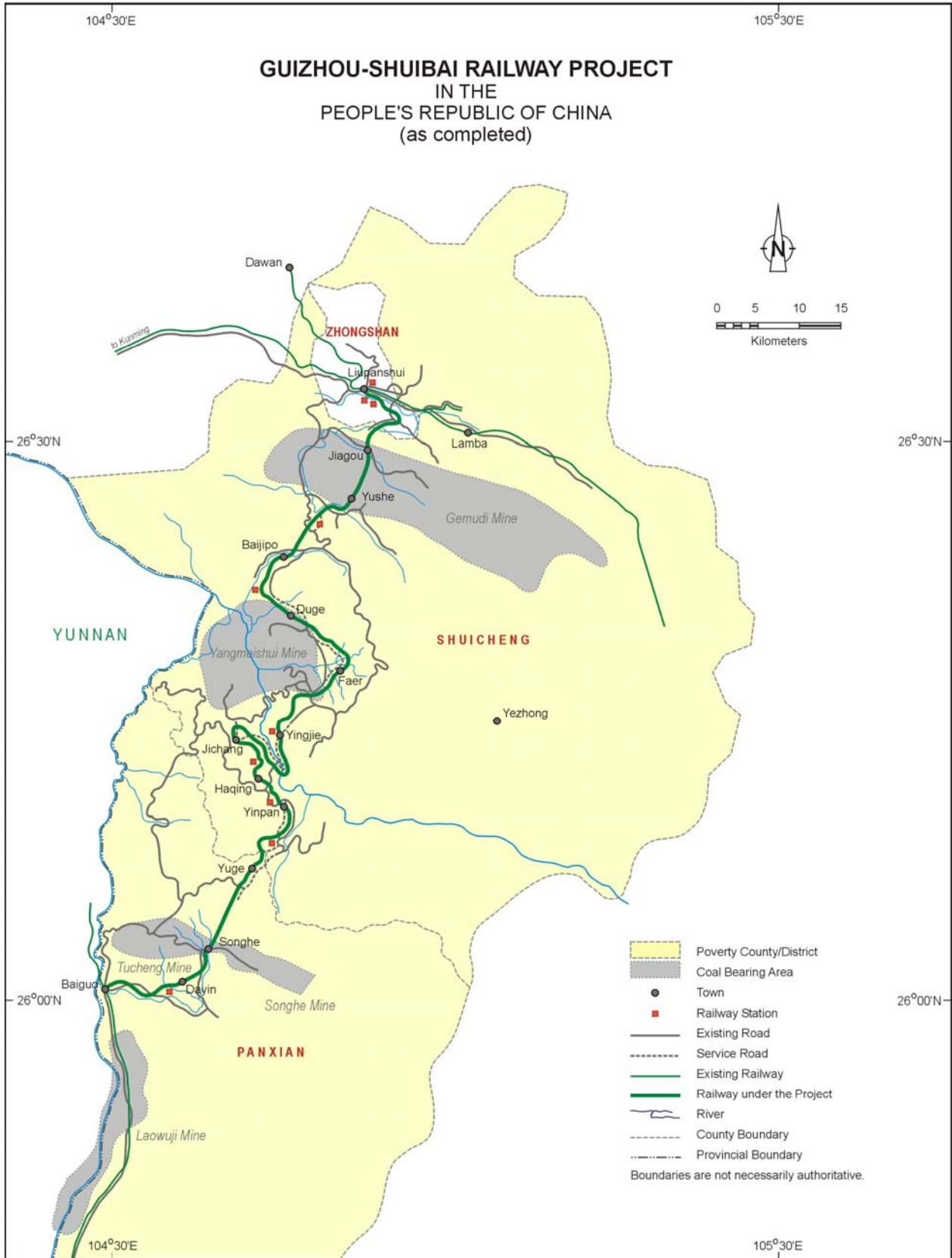
U = unsuccessful, S = successful, HS = highly successful.

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Fact-finding	1–14 Oct 1997	6	84	a,b,c,f,g,h
Appraisal	17 Feb–3 Mar 1998	4	52	a,b,g,i
Inception	3–9 Nov 1998	2	14	a,d
Review 1	15–24 Mar 1999	1	10	a
Midterm review 2	19–28 Jul 2000	2	20	a, e
Review 3	3–11 Aug 2001	1	9	a
Review 4	30 Nov–2 Dec 2001	1	4	a
Review 5	16–21 Dec 2002	1	6	b
Review 6	13–20 Oct 2004	3	24	b,d,f
Project completion review ^b	11–17 Apr 2005	2	14	b,d

^a a = engineer; b = financial analyst; c = economist; d = assistant project analyst; e = young professional; f = resettlement specialist; g = programs officer; h = environment specialist; i = counsel.

^b The project completion report was prepared by S. Lakshman Athukorala, Financial Specialist/Mission Leader, and Marie Tordecillas, Project Analyst, assisted by an international consultant and two domestic consultants.



I. PROJECT DESCRIPTION

1. The People's Republic of China (PRC) is the world's third-largest country in land area, at 9.6 million square kilometers (km²), and the largest in population—with 1.24 billion people in 1997. Its extensive transport system comprises about 61,900 km of railways, 1.16 million km of highways, 111,000 km of inland waterways, 1.13 million km of civil aviation routes, and 17,200 km of petroleum and gas pipelines.¹ However, the density of the transport network is among the lowest in the world. The dynamic growth of the economy has led to a rapid increase in demand for transport services. Despite the Government's efforts to increase transport capacity, constraints and bottlenecks affect all transport modes.

2. The project area in western Guizhou has reserves of more than 5 billion tons of good-quality coal. The production of the coal mines and the development of other natural resources have been constrained by inadequate transport infrastructure. At the time of appraisal, poverty was rife in the area and there was a widespread lack of basic health, education, and social services. The Guizhou Shuibai Railway Project (the Project) was designed primarily to increase coal and other mineral and industrial output, and also, as a secondary goal, to boost through traffic and passenger travel. The Project would provide a more reliable and economic mode of transport for coal to energy-deficient areas in Guizhou and neighboring provinces.² Further, the Project was intended to facilitate the establishment of related industries, and thus create employment and income-generating opportunities that would help reduce poverty in the project area.

3. The project railway line from Liupanshui-Shuicheng to Baiguo passes through Zhongshan and Panxian districts and Shuicheng County of Liupanshui Prefecture in western Guizhou (see map). Difficult topography made much of the project area accessible only through steep and narrow mountain roads and paths.³ The Project involved the construction of a new standard-gauge single-track electrified railway line between Liupanshui and Baiguo, which links up with the Guiyang-to-Kunming and Nanning-to-Kunming railway lines and the recently completed Neijiang-to-Kunming railway line. These combined lines provide a shortcut for transporting export goods from Sichuan, Guizhou, and other provinces in northwest China to the nearest seaports.

4. The main impact of the Project⁴ is promoting economic development and reducing poverty in the western region of Guizhou Province, and its main outcome is establishing a cost-effective mode of transport for mining and other industrial outputs and passengers in the project area. New railway tracks, associated roads, and other facilities were built.⁵ The railway investment and the activities it would promote were expected to significantly increase employment and incomes and facilitate the delivery of health, education, communications, and

¹ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project*, (page 2, para. 5). Manila.

² ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project (Project Rationale)*. Manila.

³ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project*, (page 13, para. 36, *Project Rationale*). Manila.

⁴ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project*, (page 14, para. 37). Manila. Gives the main objectives of the Project as promoting economic growth by providing necessary transport infrastructure in the Project area and creating the conditions necessary to reduce endemic poverty.

⁵ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project*, (page 14, para. 38). Manila.

other services needed to improve the lives of the poor people. The project framework is presented in Appendix 1.

5. With the Guizhou Shuibai Railway Corporation (GSRC) as the executing agency of the Project, the construction of the railway line⁶ was physically completed in June 2002. But the start of commercial freight operations was delayed by eight months, to March 2004, because of extended testing to ensure safety (para. 20). Passenger operations began on 1 February 2005. Appendix 2 gives a chronology of project milestones.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. At appraisal, ADB's country assistance strategy for the PRC railway sector had the following objectives:⁷ (i) to expand the railway system by building important new provincial lines, particularly those that would serve the less-developed inland provinces and help reduce poverty in these areas; (ii) to increase freight and passenger capacity on key routes; (iii) to modernize technology; and (iv) to strengthen institutions in the sector. The Project was therefore highly relevant to ADB's country assistance strategy, besides supporting the Government's plans and policies⁸ for railway development, since rail transport is generally a cost-effective mode of transport for coal.

7. The Project was formulated under a project preparatory technical assistance (PPTA),⁹ which (i) refined the domestic feasibility study, (ii) reviewed the environmental impact assessment prepared by the Second Survey and Design Institute of the Ministry of Railways (MOR), and (iii) assisted in the preparation of the resettlement plan and the social impact assessment. Reports prepared under the PPTA provided adequate information on the Project, except for details of local road components. The overall scope and design of the Project were well defined; however, the railway track had to be realigned during construction. The realignment shortened the railway line by 3 km without affecting the overall objective of the Project; rather, it enhanced technical adequacy, environmental protection against landslides and erosion, and worker safety.

B. Project Outputs

1. Design, Construction, and Maintenance of the Liupanshui-to-Baiguo Railway

8. The railway network has been developed around the Project railway line as planned. The connecting lines, such as the Loudi-Guiyang-Liupanshui line, the Baiguo-Hongguo line, and the marshaling yards in Liupanshui, have all been completed. Zhuzhou-Guiyang-Liupanshui section is double tracked and has been electrified since 2001. The electrification of the Project section resulted in the electrification of the entire corridor between Shanghai-Zhuzhou-Kunming.

⁶ The 121-km railway originally planned for the Project was later redesigned into a 118-km railway.

⁷ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guizhou Shuibai Railway Project*, (page 11, para. 29). Manila.

⁸ The Government's railway development policies are focused on (i) physically expanding the system and removing constraints, for national economic development; (ii) encouraging provincial governments to build local railways as joint ventures; (iii) improving the efficiency of the existing system; (iv) reducing operating subsidies; (v) undertaking institutional and structural reforms to increase the autonomy and accountability of enterprises; and (vi) encouraging nongovernment organizations to invest in infrastructure and related services.

⁹ ADB. 1997. *Technical Assistance to the People's Republic of China for Guizhou Shuibai Railway Project*. Manila.

There are plans to convert the Kunming-Zanyi section to double track if demand increases. The single-track Panxi line between Hongguo and Zanyi and the line between Neijiang and Liupanshui has been electrified. Liupanshui has become the main railway yard in the region, linking the joint-venture railways with the major national lines.

9. At appraisal, 121 km of the rail track was to be built between Liupanshui and Baiguo; the actual completed length is 118.58 route-kilometers (including a 3.32-km connecting line). The difference is due to design changes and realignment during construction necessitated by the difficult terrain in the Project area. The 118.58-km total includes 50 tunnels with a combined length of 59.31 km and 102 bridges with a combined length of 17.18 km. Seventeen civil works contract packages, including tunnels, bridges, earthworks, and culverts, were completed in July 2001. Track laying was completed in December 2001, and installation and testing of signaling, telecommunications, electrification, and power supply facilities were completed in August 2003. Appendix 3 gives the details of the contract packages. Extended testing delayed the start of commercial freight operations until March 2004, and passenger operations began on 1 February 2005 (para. 38). Seven railway stations have been built; however, only five are operational: Baiguo, Fa Er, San Jia Zhai, Song He, and Ye She. Another six stations will be built¹⁰ if needed to meet increased demand. Ultimately, 13 stations will be built along the project railway.

10. The technical standards of the project railway correspond to the class 1 standard defined by MOR.¹¹ The standard gradient is 1.2%, with some short sections with a gradient of 2.35% in the more rugged stretches where two locomotives are required to haul trains. The entire route is electrified to allow the operation of electric locomotives. For train control, a semiautomatic block relay signal system with electric interlocking and color light signals was installed. Bridges were designed to withstand possible cataclysmic flooding, based on data available for 100 –years, and tunnels were built to the standard clearance for national railways. Trains on the project railway line have a gross load of 3,100 tons and a net revenue load of 2,217 tons.

11. The completed civil works are considered to be of excellent quality and consistent with international standards. The project facilities are adequately maintained; however, more attention should be paid to clearing and repairing side drains, painting bridge handrails and other corrodible metal structures, and renewing ballast at stations and other areas with high pedestrian traffic. Slopes are adequately protected by a combination of retaining walls, arch block slope protection, shotcrete, rockbolt-supported netting, and rockbolt anchorage. Plants and environmental protection measures have been integrated with the natural terrain.

2. Connecting and Link Roads

12. As foreseen at the time of appraisal, service/access roads to various parts of the Project were built by GSRC to give access to the civil works contractors. These roads (220.3 km) were later turned over to the local villages to be used for the transport of agricultural products to markets, and goods to the villages. The roads were given free of charge to the villages, in exchange for their taking over responsibility for maintenance. Though the service roads were built as project inputs, their positive economic impact on the villages¹² in the Project area that had no road access before the Project qualifies them to be considered as outputs of the Project.

¹⁰ These stations will be for passenger transport only. All marshaling yards meant for freight transport have been completed and are operational.

¹¹ MOR's Railway Line Design Protocol defines class 1 railways as those that haul over 15 million tons per annum (mtpa) and have a maximum operating speed of 120 km per hour.

¹² Detailed analysis is given in Appendix 16, Social and Poverty Reduction Impact in the Project Area.

3. Institutional Strengthening

13. GSRC operates and maintains the project railway. At appraisal, the need to install computerized management information and financial accounting systems was identified and provision was made for the hiring of international consultants to help design and install these systems in GSRC. The consultants¹³ were fielded in September 2002 and submitted their final report in February 2003. They recommended the procurement of the necessary hardware and software. GSRC has yet to procure¹⁴ the recommended equipment but has set aside enough funds for this purpose (para. 28).

14. In January 2003 the international consultants trained 40 GSRC staff members to use the transport management information system and the financial accounting system. A further management seminar was held in March 2003 to discuss how GSRC should retain and even expand its share of the transportation market. Key GSRC staff attended seminars and discussions in the United States with the US Federal Railway Administration and the Short Line and Regional Railway Association. GSRC staff members were also trained in the US in passenger train management, service facilities, and service quality. Total of 29 staff members underwent training and all 29 are still working for GSRC. GSRC believes that these training activities helped improve its management. However, the full impact of the training cannot be measured.

C. Project Costs

15. The actual cost of the Project was \$392.6 million, compared with \$381.0 million estimated at appraisal. This cost total comprised \$165.6 million in foreign exchange cost (\$170.1 million at appraisal) and \$227.0 million equivalent in local currency cost (\$210.9 million at appraisal). The civil works cost \$238.9 million, versus the \$215.0 million estimated at appraisal, because of design changes during construction that were necessitated by the difficult terrain. Bid prices raised the cost of track work (\$46.1 million, compared with the appraisal estimate of \$36.9 million) and signaling, telecommunications electrification, and operating equipment (\$36.3 million, as against \$31.9 million at appraisal) but lowered the cost of Buildings and other facilities (\$4.2 million, versus \$7.7 million at appraisal). Land acquisition and resettlement, at \$8.7 million, was nearly double the \$4.4 million estimated at appraisal, because more people were affected and the demolition of houses and infrastructure was more extensive (para. 22). Administrative, consulting services, and miscellaneous costs increased from the \$15.8 million estimated at appraisal to \$27.6 million, with local expenditures (\$27.2 million, versus the \$15.4 million estimated at appraisal) accounting for nearly all of the cost difference. The cost of hiring international consultants remained at \$0.4 million as planned. Interest during construction and other charges increased from an estimated \$26.5 million at appraisal to \$30.8 million as a result of short term borrowings. Appendix 4 compares in detail the project costs at appraisal and at completion.

16. According to the financing plan at appraisal, ADB would finance \$140 million—82.3% of the estimated foreign exchange expenditures and 36.7% of the total project cost. The remaining 17.7% in foreign exchange expenditures would be financed by GSRC, which would also cover \$138.6 million of the local currency requirement; a loan from the State Development Bank (SDB) of the PRC would make up the \$72.3 million balance. Of the amount financed by ADB,

¹³ Transport and Economic Research Associates (USA) associated with Fourth Survey Design Institute (PRC).

¹⁴ GSRC decided to defer the installation of the computerized accounting system till the start of the full commercial operations as the benefits of such a system at the initial stages of the Project is minimal.

\$105.0 million, or 26.7% of the total project cost, was used. GSRC financed \$154.4 million and SDB provided a loan of \$72.6 million for the local currency requirement of \$227.0 million. The ADB loan was underutilized because tender prices for ICB civil works contracts were lower than expected. The appraisal and actual financing plans are compared in detail in Appendix 4.

D. Disbursements

17. The funds were generally disbursed through reimbursement, commitment letter, and direct payment. Disbursements started in August 1999 and ended on 15 March 2004, when the loan was closed. Accelerated implementation led to higher-than-planned disbursements in the first 3 years of implementation. But of the \$140 million in loan proceeds, \$35 million was saved because of lower contract prices for the ADB-financed components and canceled. Appendix 5 shows the actual annual disbursement during the implementation of the Project.

E. Project Schedule

18. The loan was approved on 18 August 1998, signed on 23 February 1999, and took effect on 24 May 1999. In view of the fact that the construction would take place in difficult terrain and severe winter conditions, on 13 February 1998 ADB approved advance action for prequalification of civil works contractors, evaluation of bids, and related activities up to the awarding of the contract. Land acquisition and resettlement began in January 1998, 6 months earlier than expected at appraisal, and were completed by March 2001, almost 2 years earlier than envisaged (December 2002).

19. The main civil works that were originally scheduled to begin in August 1998 began in early-January 1998 and were completed in July 2001, 17 months ahead of schedule. Track laying, originally expected to start in January 2000, started late, in October 2000, but was completed in November, 13 months earlier than expected at appraisal. Likewise, telecommunications, signaling, and electrification, originally scheduled to begin in January 2000, started late (December 2000), but was completed 7 months early, in May 2002. All project construction work was completed 7 months ahead of the planned completion date of December 2002. However, the time allotted for construction did not change; the early start of civil works construction in January 1998, 7 months ahead of schedule, and close project management made early completion possible.

20. At first, the test operations were expected to start in August 2001 and to be carried out intermittently over 15 months until May 2002. However, GSRC decided to start the test operations in September 2002, after all project construction works were completed. The test period stretched to 19 months¹⁵ and delayed the start of commercial operations by about 8 months (to March 2004, versus the scheduled start-up on July 2003). Though revenue was lost in this period, the extended testing helped ensure the safety of the project railway line. A graph in Appendix 6 compares the actual and appraisal implementation schedules.

¹⁵ The test operations used only one pair of freight trains daily at the start, but another pair of freight trains was later added.

F. Implementation Arrangements

21. Throughout the implementation period the implementation arrangements were as agreed at appraisal. GSRC was the Executing Agency, responsible for operating the project railway¹⁶ and for carrying out all project implementation activities, including land acquisition and resettlement, procurement of goods and services, civil works construction, and commissioning of the railway. A project management office (PMO), headed by a qualified project manager and staffed with an adequate number of suitably qualified railway professionals from GSRC, was formed.

22. The Liupanshui municipal government (LMG) was made responsible to assist GSRC for land acquisition and resettlement. The Guizhou Social Sciences Academy (GSSA) carried out external monitoring and submitted semi-annual monitoring reports to ADB from 1998 to 2001. The total population affected by the Project increased from 2,466 persons (in the resettlement plan prepared by the PPTA consultants) to 29,653—4,364 of these were affected by house demolition (versus the expected 2,466) and 25,289 were affected by land acquisition, including permanent and temporary use (versus the 997 in the PPTA resettlement plan). Consequently, the total cost of land acquisition and resettlement increased by 95% (from CNY36.73 million to CNY71.6 million). The large increase was due mainly to poor estimates at the appraisal stage and also partly to the need to realign the railway during construction to avoid difficult terrain and landslide-prone areas. Also, in one case, the Song He Township Central School in Panxian County had to be relocated because it would be too close to the completed railway. The land acquisition and resettlement activities are evaluated in detail in Appendix 7.

23. The monitoring of environmental impact and mitigation measures was contracted to the Guizhou Designing Institute of Environmental Sciences (GDIES). GDIES submitted periodic reports to ADB and a final report in January 2004. The detailed environmental impact analysis is in Appendix 8.

G. Conditions and Covenants

24. All covenants due as of April 2005 have been complied with. No covenants were modified, suspended, or waived during implementation. All covenants remained relevant and appropriate in monitoring the progress of the Project. The major covenants and the compliance details are presented in Appendix 9.

H. Consultant Recruitment and Procurement

25. No international consultancy services were included in construction supervision. The Project included 12 person-months of international consulting services for (i) development and design of computerized management information and financial accounting systems; (ii) preparation of bid documents and assistance in the procurement of hardware and software for the systems; (iii) training of GSRC staff to operate, maintain, and update the systems; (iv) preparation of working manuals for the systems; (v) organization of seminars for management and accounting staff in the use of the systems; and (vi) organization of overseas study tours for GSRC staff. The international consulting services related to computerization started from September 2002 after the main civil works were built and were completed within

¹⁶ After the Project, GSRC acquired the 43-km rail line from Baiguo to Hongguo and underwent a change in its company name. "GSRC" now stands for "Guizhou Shuihong Railway Company." Details of these developments are in Appendix 10.

12 person-months as planned. An international consulting firm was hired in accordance with ADB's guidelines¹⁷ and the contract was signed in July 2002 (para. 28).

26. Domestic consultants were hired according to procedures followed in PRC and acceptable to ADB. Their responsibilities were: (i) detailed design; (ii) supervision of international procurement; (iii) construction supervision; (iv) quality control; (v) monitoring of environmental impact and mitigation; (vi) monitoring and evaluation of the resettlement plan and the plan for ethnic minorities; (vii) socioeconomic impact assessment; and (viii) evaluation of poverty reduction. The domestic consulting services were financed by GSRC with its own funds.

27. All procurement funded from the loan funds was in accordance with ADB's *Guidelines for Procurement*. GSRC hired a domestic procurement agency for the tendering activities. No significant problems were encountered in the packaging of contracts, preparation of bid documents, bid evaluation, and awarding of contracts. The details of contract packages financed from the ADB loan are given in Appendix 3.

I. Performance of Consultants, Contractors, and Suppliers

28. The international consultants completed their assigned tasks satisfactorily and within the agreed schedule up to the point of procurement and installation of hardware and software for the management information and financial accounting systems. GSRC decided to defer the procurement of the hardware and software recommended by the international consultants to late-2005 (paras. 13 and 66). Hence, the performance of the international consultants could not be assessed but GSRC has accepted the recommendations given by the international consultants. The domestic consultants were all experienced in the design of similar projects; however, the difficult terrain made design changes necessary during construction. These design changes did not affect the project implementation and helped to improve the safety of the Project. Construction supervision, construction quality control, and monitoring services performed by the domestic consultants were satisfactory.

29. The civil works contractors performed satisfactorily, with all works being completed well ahead of the schedule agreed at appraisal. Likewise, the track laying was completed quite satisfactorily about one year ahead of schedule. Telecommunications, signaling, and electrification were also completed satisfactorily and ahead of schedule. Suppliers for materials such as Portland cement, reinforcing steel, and track presented no problems as they delivered the materials on time.

J. Performance of the Borrower and the Executing Agency

30. The Borrower, represented by the Ministry of Finance (MOF), and the EA (GSRC) performed highly satisfactorily. Throughout the implementation, both the Borrower and the EA made timely decisions and actions, except in the case of implementing and finalizing the computerized management information and financial accounting systems, which is still pending. The PMO staff performed diligently and were dedicated to the successful completion of the Project. The project completion report prepared by GSRC was submitted on time and was satisfactory.

31. The EA, GSRC, recently acquired the assets of the Hongguo-to-Baiguo railway line from the MOR, and thus took over 43 kilometers of state-owned railway line together with the

¹⁷ ADB. *Guidelines on the Use of Consultants by Asian Development Bank and its Borrowers*. Manila.

connected facilities which are adjacent to the project railway. GSRC issued equity shares to MOR for the agreed value of the assets taken over. The assets had been transferred and the shares issued by the end of October 2004. This acquisition helped GSRC operate more economically. The organization chart of GSRC and the details of its reorganization are given in Appendix 10.

K. Performance of the Asian Development Bank

32. The performance of ADB was satisfactory. ADB staff went on an inception mission, five review missions, and a midterm review mission over 5 years to monitor project progress and resolve implementation issues. The progress of implementation was also monitored through regular communications with GSRC by fax, e-mail, and telephone. There were no disagreements with the Borrower. No delays were noted in the approval of bid documents, disbursements, and other implementation activities. However, more ADB review missions during the last stage of implementation and ADB follow-up of the commercial operations of the railway line would have been helpful in expediting the commercial operation of the project railway. Also, ADB could have seen to it that more care was taken in gathering information at the time of appraisal (para. 64).

III. EVALUATION OF PERFORMANCE

A. Relevance

33. The rationale for the Project was sound, considering the high priority given to the economic development of the resource-rich southwest Guizhou Province and the Government's strategy of improving the less-developed central and western region by removing constraints, making the railway system more efficient, and undertaking institutional and structure reforms.

34. Without the Project, the only mode of mechanized transport in the project area would be by road. The upgrading of roads to accommodate the forecast traffic would have been a massive undertaking. Economic development in the project area would have been stifled, access to remote villages would have been difficult, road accidents and deaths would have increased. The Project has had other economic benefits, including increased employment opportunities, improved market access, poverty reduction, and better living conditions for the residents along the railway, who are supplied with electric power from the power grid provided for the electrification of the railway.

35. As designed, the Project had more emphasis on coal transport and less on passenger transport. Coal production in the project area had dropped in the previous 4 years with the closing of 80 small mines which lack safety features (para. 36). But according to the latest available projections, coal production in 2006 will exceed the figures projected at the time of appraisal. Hence, coal production in the future will make the Project even more relevant. The Project railway has become the lifeline of people living alongside it, whose options for transportation in the past were extremely limited. Passenger transportation has increased as a result, and there is now a high degree of focus on passenger transportation activity along the Project railway line. With this development the Project has become highly relevant.

B. Efficacy in Achievement of Purpose

36. Appendix 11 presents an analysis of coal production in the project region showing historical production (1997–2004) and revised projections (2006–2022) in comparison with the

appraisal projections made in 1998. The closing of all small mines in the area in the last 4 years, to improve environmental conditions in compliance with a loan covenant, had affected coal production and, in turn, freight transportation along the project railway line. But the projected increase in mine output by 2006, in excess of the coal production projected at appraisal, will significantly improve freight transport volume and efficiency on the railway line.

37. Appendix 12 analyzes the traffic on the Project railway line. The growth pattern between 2006 and 2022 is based both on past experience and on growth in adjacent railway transportation. The major reasons for the flat growth in traffic between 2012 and 2022 are (i) the need for another six buffer stations (crossings for single-line railways) to improve transportation capacity; (ii) the less than full development of the local economy along the railway ; (iii) the prevailing shortage of wagons in southwest China, which also limits the transportation capacity of the railway line; and (iv) expectations that the designed capacity of the Project railway line will be reached from 2012 onward. The traffic level in 2012 cannot increase any further without compromising safety and unless the extra buffer stations are built and more wagons are acquired by GSRC.

38. GSRC was aware of safety issues throughout project preparation and implementation. Several sections were realigned to protect construction workers from landslides. Safe operations are a priority for GSRC, as evidenced by the extended testing to ensure a safe railway line. Passenger travel by rail is significantly safer than travel by road in this mountainous area of southwestern China, particularly in winter, when the area receives large amounts of snowfall. Test operations for 15 months, between August 2001 and June 2003, were planned at appraisal. But the period was eventually extended to 19 months, between September 2002 and March 2004, without materially affecting the performance of the railway line, except for the delay of 8 months in the start-up of commercial operations (para. 9 and 20).

39. The Project has achieved its primary purpose of providing a cost-effective mode of transport for mining and other industrial outputs and people in the area. For example, it takes 12 hours to transport coal by train from Songhe coal mine to Guiyang, at a cost of CNY90 per ton; by road it took 20 hours and cost CNY210 per ton. The PCR mission learned that passenger transport from the project area to Liupanshui has vastly improved. The transport cost per passenger has dropped to CNY11 from CNY55, and transport time has been reduced to 3.5 hours from 5–8 hours.

40. The Project is considered highly effective since it (i) provides new rail capacity in the Project corridor (para. 9); (ii) presents a safer transportation mode¹⁸ for freight and passengers; (iii) enables the economy to grow and endemic poverty to be reduced through increased employment and higher income levels (para. 52); and (iv) facilitates the delivery of health, education, communications, and other public services to the rural poor (para. 52).

C. Efficiency in Achievement of Outputs and Purpose

41. The Borrower and GSRC implemented the Project efficiently and ensured timely and adequate counterpart funding. The planned outputs were completed 7 to 21 months ahead of the appraisal schedule (Appendix 6). The physical facilities were completed well before loan closing and are now in operation. The financial performance of GSRC is analyzed in Appendix 13. The financial statements presented in the appendixes are based on the actual results from 1998 to 2004 and on GSRC's traffic forecast for 2005 onward. The revenues from freight traffic

¹⁸ Especially during winter rail transport in the mountainous project area is considered safer than road transport.

were CNY12.95 million in 2003 and CNY73.1 million in 2004, substantially below the appraisal forecast of CNY206.9 million and CNY328.7 million, respectively. The revised freight traffic forecast projected at a higher growth rate will match the traffic forecast at appraisal in or around 2008 and will continue to grow until full capacity is reached in 2012. The average freight hauling distance is longer than the distance at appraisal because of the acquisition by GSRC of an adjacent 43-km railway line.

42. The freight tariff remains at CNY0.28 per ton-km for local freight traffic and CNY0.12 for transit freight traffic throughout the period, much lower than the projected tariff level, because of marketing considerations. Consequently, the revenues are only almost half of the appraisal estimate. The passenger operation did not generate any revenues until 2005. At present the passenger operation is outsourced to the Kunming Railway Administration Bureau (KRAB) for 20 years. According to the outsourcing contract, KRAB will turn in annual revenues of CNY5.99 million per pair of passenger trains to GSRC. As forecast by GSRC, there will be two pairs of passenger trains in operation in 2005, and four pairs in operation from 2006 onward.

43. Despite the substantial reduction in revenues, the reevaluated financial internal rate of return (FIRR), calculated using the assumptions set out in Appendix 14, shows a healthy FIRR of 4.19%, compared with 6.8% at appraisal. The major reasons for the lower FIRR are (i) lower tariff and (ii) lower forecast freight traffic than at appraisal. The actual tariff is CNY0.12 per ton-km for transit freight traffic and CNY0.28 per ton-km for originating and terminating freight traffic, and these tariff levels are expected to be maintained until 2022.¹⁹ At appraisal the projected tariff for both transit and local traffic was CNY0.394 ton-km, increasing at 4% annually until it reached about CNY0.462 in 2007.

44. With revenues lower than expected, GSRC has made a great effort to cut operating costs. Since 2004 its transportation operation and maintenance business has been outsourced to KRAB through an O&M contract. As a result, the GSRC staff has been drastically reduced, from 720 at appraisal to 42 in 2003, and will stay at this level.

45. Lower-than-appraisal revenues have affected the cash flow. To make up for the cash deficiency at the start of operations, the debt service plan has been readjusted. The grace period for SDB debt was spread to 8 years (instead of 7 years at appraisal), with the first installment in 2004. The reduced ADB loan drawdown, from \$140 million to \$105 million, also helped. Even so, GSRC still faces a cash-flow problem between 2005 and 2008 due to its heavy burden of debt and interest payments.

46. The Project was subjected to economic reevaluation using the same “with-Project” and “without-Project” assumptions (Appendix 15). Freight traffic may be substantially lower than forecast but this is offset to some extent by much higher originating and terminating passenger traffic. Another offsetting factor is coal production, which, though lower than appraisal in 2003 and 2004 because of the nationwide campaign to shut down small and unprofitable mines, will gain growth momentum from 2005 and is projected to reach 4.7 times the appraisal level in 2022. The economic internal rate of return (EIRR) is 20.8%, against 18.0% at appraisal. The benefits arising from the transfer of project-related service roads to public use were included in the economic reevaluation (but excluded at appraisal), resulting in a higher EIRR. Benefits arising from the avoidance of accident costs and adverse environmental impact, and from non-coal industrial production, were excluded. The socioeconomic benefits from local development around the station areas were also excluded.

¹⁹ According to discussions with provincial pricing authorities and the MOR.

47. The revised FIRR of 4.19% for the Project is higher than the weighted average cost of capital (WACC) of 2.86%. GSRC has the needed staff and resources to run the project railway and maintain it in good condition. The recalculated EIRR of 20.8% is higher than the appraisal estimate of 18%. The reevaluation shows that the Project is financially viable and cost-effective and remains economically viable. On the basis of those analyses, the Project is rated efficient.

D. Preliminary Assessment of Sustainability

48. The Project is technically and financially sound. There is strong ownership and commitment to the Project on the part of GSRC and the provincial and local governments. GSRC has appropriate, well-trained staff who can run and maintain the facilities efficiently. For human resource development, GSRC is cooperating with, and receiving assistance from, railway companies managing other ADB-funded local railways. GSRC has participated in seminars and workshops financed by ADB to spread reforms, transfer expertise, and provide working knowledge of the commercial railway operations. Appropriate maintenance and operating policies and procedures are in place. GSRC has given its assurance that computerized management and financial accounting systems will be in place before the end of 2005.

49. Recent production trends indicate that coal production will increase significantly. The establishment of other industrial operations will intensify demand for rail services in the project area. As noted in Appendix 10, the reorganization of GSRC has resulted in positive indicators and is expected to improve the profitability of the company and, hence, its sustainability. The financial reevaluation (Appendix 14) highlights the financial sustainability of the Project, particularly with the establishment of freight and passenger tariffs that will allow full cost recovery, and the high demand for freight and passenger transport.

50. The Project has transferred 220.3 km of service/access roads built in conjunction with the civil works construction to local villages for management (para. 57). Village associations are responsible for maintaining these roads. The roads are not paved and do not require large sums to maintain. The village associations use free village labor to maintain the roads. With the current maintenance system in operation, the sustainability of these service/access roads is assured. Link roads to the stations built by the local governments are being maintained by the local government authorities.

51. Project sustainability is rated most likely.

E. Environmental, Sociocultural, and Other Impact

52. The main goal of the Project was to reduce endemic poverty and promote economic development in the western region of Guizhou Province. During implementation (1997–2000) net per capita incomes in the project area increased by 28.39%²⁰ and the proportion of the population below the poverty line was reduced from 46% in 1998 to 21% in 2003. Within the same period the per capita rural net income in PRC increased by only 7.8%.²¹ The Project has provided better access to health care, bigger markets, and better employment opportunities. Appendix 16 presents a detailed review of the social and poverty reduction impact of the Project in the project area.

²⁰ Source Guizhou Shuibai Railway Corporation: Per capita income increased from CNY1,164.68 in 1997 to CNY1,495.33 in 2000.

²¹ Per capita rural net income increased from CNY2,090.13 in 1997 to CNY2,253.42 in 2000.

53. Particular attention was paid during project implementation to improving the lives of ethnic minorities in the project area. During construction, 75% of the unskilled jobs were reserved for ethnic minorities; 15% of those jobs went to women.²² Special agricultural training seminars were organized for ethnic minorities and microcredit programs were made available to them. Villages where many ethnic minorities reside were provided with access roads and electricity and water supply systems. All these initiatives have significantly improved income levels and quality of life. Appendix 17 provides a more detailed evaluation of the development of ethnic minorities under the Project.

54. In December 1993, an environmental impact assessment (EIA) of the Project was prepared by the Second Survey & Design Institute (SSDI). During project appraisal, a summary environmental impact assessment (SEIA) was prepared by the PPTA consultants, circulated to ADB's Board of Directors, and made public. The final alignment was selected to minimize construction costs and adverse environmental impact. During implementation, environmental monitoring and mitigation measures were carried out in accordance with the EIA and SEIA.

55. To minimize adverse environmental impact (i) spoils from tunnel excavations and other places were used as far as possible in building embankments or railway stations; what could not be used was deposited in a valley nearby with retaining walls; (ii) unstable slopes were given proper and timely slope treatments to avert landslides and erosion; (iii) more than 70,000 plants were planted on the embankment slopes to increase the forest cover by about 530 mu (35.3 hectares [ha]) along the railway; (iv) around 300 mu (20 ha) of land acquired for temporary use was leveled and transferred to the local farmers for replanting; (v) ditches or conduits were built to drain surface runoff; (vi) low-noise and low-pollution machines were used during construction; (vii) working time was limited at construction sites near villages or other inhabited areas; (viii) supervisors were trained to deal with the buildup of harmful gas in tunnels, gas detection equipment was purchased, tunneling proceeded with proper ventilation and with the use of explosion-proof machines; and (ix) the design of culverts and other drainage structures was further revised and perfected to avoid damage to the local draining system.

56. The GDIES monitored noise, air, water, and other environmental conditions and regularly submitted its findings to GSRC. Noise levels at representative noise-sensitive points in seven stations along the Shuibai Railway meet acceptable class III standards.²³ The water quality monitoring results show that the discharge from drains or channels along the railway has not significantly affected the quality of water discharged into rivers. Air environment quality meets acceptable class II standards. The environmental impact analysis is provided in Appendix 8.

57. The Project railway line, together with its service/access roads, has helped improve the social and living conditions in the project area. Table 1 below lists the service/access roads built in the project area, the transport vehicles purchased by the villages, and the estimated increase in annual income per village. It should be noted that before the Project the villages owned no transport vehicles as there were no road links to these areas.

²² Source Guizhou Shuibai Railway Corporation.

²³ National Standard 3096–1993.

Table 1: Service/Access Roads along the Railway

No.	Township	Village	Length (km)	Transport Vehicles Purchased by Villages		Estimated Increase in Income ^a (CNY'000 per village)
				Small Truck	Motorcycle	
1.	Yu She	Hai Gu Tang	3	5	7	100
2.	Yu She	Da Ping	4	2	5	50
3.	Du Ge	Ya Kou	15	6	6	100
4.	Yang Mei	Qun Lian	12	5	6	100
5.	Fa Er	Ying Chang	20	7	10	150
6.	Fa Er	Yue Jin	35	6	5	100
7.	Fa Er	Min Zhu	37	5	6	100
8.	Xin Jei	Du Mu Gu	5	1	2	20
9.	Xin Jie	Mao Jiao Duo	4	2	2	30
10.	Ying Pan	Luo Duo	11	2	3	50
11.	Ying Pan	Yu Sa	13	2	2	40
12.	Ying Pan	Luo Ga	23	4	4	80
13.	Ying Pan	Ji Xi Ping	30	5	5	90
14.	Ying Pan	Gan Gou	8	2	4	40
Total			220	54	67	

^a The estimated increase in income in each village is based on estimates provided by village headmen considering the of tractors, small trucks, and motorcycles purchased by the village after the Project.

Source: Guizhou Shuibai Railway Corporation and township governments.

58. The Project involved a substantial amount of land acquisition and resettlement. At appraisal, it was estimated that 434.47 ha of land would have to be acquired for the construction of the railway, 124.13 ha of land would be required for temporary occupation, and 37,774 m² of structures would be demolished. Land acquisitions, whether for temporary or permanent use, were paid for on the basis of the price of permanent land acquisition. At project completion, 539.75 ha of land had been permanently acquired or temporarily occupied for railway construction, in the process affecting 29,653 persons in 7,925 households, and 98,042 m² of houses and 10,102 m² of factory and institutional structures had been demolished (para. 22). Of the demolition of houses affected 4,364 people in 1,073 households, compared with the estimated 2,466 persons in 615 households at appraisal. There was an increase in the number of those affected by the demolitions partly because of the realignment in the detailed design of the Project. Ethnic minorities, mainly of the Yi and Miao peoples, made up about a third of the affected population. Land compensation and resettlement costs increased from CNY50.1 million at appraisal to CNY71.6 million. The higher resettlement costs were due mainly to increased dwelling/building relocation and the higher costs of affected infrastructure. The new houses were larger and better than the previous ones. Those new houses were mainly concrete brick or brick timber houses, and were provided with electricity and water supply. Some of the affected persons interviewed confirmed that they had a better and more comfortable life than before and expressed satisfaction with the compensation and resettlement arrangement.

59. The land acquisition and resettlement were carried out in 1998 and 2001. By 2001 virtually all land acquisition and resettlement had been completed, and the infrastructure facilities affected had been either restored or reconstructed. GSRC was responsible for land acquisition and resettlement. The district and county governments created district and county resettlement offices to handle resettlement matters, including conducting group discussions with

affected persons and surveys within their respective jurisdictions. GSRC allocated resettlement and compensation funds to these district and county offices, and the affected village groups and households received the funds through their townships and villages. Overall, the resettlement was implemented in a satisfactory manner.

60. The railway funded under the loan has contributed to economic development in the areas affected by the Project, by providing better, faster, safer, and cheaper access to markets, employment opportunities, and social services (para. 39). Service roads (para. 12) and 8,000 m² of houses built during the civil works construction were transferred for free to the local villages for them to use and manage. Many of the structures were turned into schools, clinics, and houses for the elderly. Railway construction used 4.19 million person-days of local labor, which was paid for at the monthly rate of CNY500–600 per capita. The land acquisition and resettlement activities are evaluated in Appendix 7; the social impact of the Project in the project area, particularly the success it has achieved in reducing poverty, is analyzed in Appendix 16; and developments related to the ethnic minorities are discussed in Appendix 17. The Project is deemed to have had significant environmental, sociocultural, and other impact.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

61. The formulation and design of the Project was technically sound and highly relevant to the achievement of its development goals at appraisal and at completion. The main outputs were implemented well and completed ahead of schedule. The Project achieved its main goals of increasing per capita incomes and reducing the proportion of the population in the project area below the poverty level. The purpose, to establish a cost-effective mode of transport for mining and other industrial outputs and passengers in the project area, was attained. The quality of the completed works is high. The reevaluation by the project completion review mission showed that the Project remains economically viable, with an EIRR of 20.8%, and financially viable and cost-effective, with an FIRR of 4.06%. Overall, the Project is rated highly successful.²⁴

B. Lessons Learned

62. As with past ADB railway projects in the PRC, the appraisal projections for freight traffic in the project area were unrealistically high and, conversely, the passenger traffic projections were extremely low and have already been significantly exceeded (Appendix 12). Coal production projections at appraisal were significantly below current projections (Appendix 11). Also, in land acquisition and resettlement, projections at appraisal were significantly lower than the actual figures (para. 22).

63. The service/access roads and link roads connecting the railway stations to population centers were two important components of the Project, and yet they were not clearly specified in the appraisal. These should have been specified in detail at appraisal to allow the construction and finalization of all the roads to be monitored and evaluated during implementation and at project completion. As mentioned in para. 35. The Project was designed to give more emphasis to coal transport and less to passenger transport. But later on the focus on passenger transport

²⁴ Rating is based on PPAR rating. Relevance: highly relevant (rating 0.6); efficacy: highly efficacious (rating 0.75); efficiency: efficient (rating 0.4); sustainability: most likely (rating 0.6); and other impact: significant (rating 0.3). Overall weighted rating: 2.65.

increased significantly, and the Project was flexible enough to accommodate the increased demand for passenger transport. Without such flexibility, the Project would have been less successful.

C. Follow-Up Actions and Recommendations

1. General

64. ADB should take more care when preparing appraisal projections and avoid presenting over-optimistic projections at the time of appraisal. Though such over-optimistic projections (para. 62) did not affect the Project, more conservative projections will ensure that marginally viable projects will not get ADB's approval.

2. Project-Related

65. A performance audit of the Project should be done in 2007, by which time the Project would have been in full operation for more than 3 years and traffic, maintenance, and physical conditions and the benefits attained may be better assessed.

66. GSRC has given its assurance that its computerized management and financial accounting systems, which have not yet been implemented, will be in place before the end of 2005 (paras. 13, 28, and 48). ECRD should follow up the implementation of the computerized management information system, which is scheduled to be completed in late 2005.

67. As stated in para. 57, the service/access roads built have had a major impact on the poor living in the project area. If these gravel service roads, which were handed over to the villages, could be upgraded to sealed roads, there would be an even greater improvement in the living conditions of the poor farmers in the area. It is therefore recommended that the Borrower look into the possibility of improving or upgrading the service/access roads built under the Project.

PROJECT FRAMEWORK

Design Summary	Performance Targets		Data Source	Assumptions and Risks
	Appraisal	Actual		
<p>Impact Increased economic development and poverty reduced in the western region of Guizhou Province</p>	<ul style="list-style-type: none"> To increase per capita incomes To reduce the proportion of the population below the poverty line 	<ul style="list-style-type: none"> Per capita income increased by 28% between 1997 and 2000 Those below the poverty line in the project area decreased from 46% in 1998 to 21% in 2003 	<ul style="list-style-type: none"> GSSA GSSA 	<ul style="list-style-type: none"> Coordinated development of coal mines, industries, physical infrastructure, and social programs
<p>Outcome A cost-effective mode of transport for mining and other industrial outputs and for passengers in the project area</p>	<ul style="list-style-type: none"> Increased freight and passenger volumes Commercialization of operations; attainment of financial performance targets 	<ul style="list-style-type: none"> Freight volume increased by 119% between 2003 and 2004 FIRR of 4.2% achieved 	<ul style="list-style-type: none"> GSRC 	<ul style="list-style-type: none"> Strong absorptive and implementation capacity. Resolution of cash-flow difficulties in first few years of operation
<p>Outputs 1. 121-km standard-gauge single-track electrified railway line from Liupanshui to Baiguo 2. Procurement of equipment for operation and maintenance 3. Computerization of management information and financial accounting systems of GSRC</p>	<ul style="list-style-type: none"> Construction from July 1998 to December 2002 Equipment to be procured by December 2002 Systems design and installation by December 2000 	<ul style="list-style-type: none"> 118.5-km railway line completed in May 2002 Equipment procured on time Design completed by February 2003; systems installation to be completed by December 2005 	<ul style="list-style-type: none"> GSRC completion report GSRC GSRC completion report 	<ul style="list-style-type: none"> Strong implementation capacity of GSRC Adequate counterpart funds

Design Summary	Performance Targets		Data Source	Assumptions and Risks
	Appraisal	Actual		
4. Construction of service/access and link roads	<ul style="list-style-type: none"> Construction of link roads completed by December 2002 	<ul style="list-style-type: none"> 220 km of service/access roads, 2 km of link roads completed; another 28 km of link roads being constructed 	<ul style="list-style-type: none"> GSRC and local governments 	<ul style="list-style-type: none"> Commitment of local government Adequate counterpart funds
5. Institutional development	<ul style="list-style-type: none"> GSRC corporatized Signing of concession agreement and operation and maintenance 	<ul style="list-style-type: none"> GSRC corporatized Concession agreement signed 	<ul style="list-style-type: none"> GSRC 	<p>Government's commitment and ADB assistance in concluding concession agreement</p>
Activities – Milestones			Inputs	
1.0 Preconstruction activities, from January 1998 to June 1999			<ul style="list-style-type: none"> Incorporation of GSRC Arrangement of counterpart funds Environmental impact assessment Survey and design Advance action for procurement Concession agreement ADB appraisal 	
2.0 Land acquisition and resettlement, from July 1998 to December 2000			<ul style="list-style-type: none"> Preliminary survey Detailed land acquisition plan Acquisition of land and resettlement of affected persons 	
3.0 Civil works construction and equipment procurement 3.1 Procurement of civil works, by June 2001			<ul style="list-style-type: none"> Hiring of ITC by GSRC Prequalification of bidders Invitation to bid Evaluation of bids Awarding of contracts 	
3.2 Mobilization and construction of service roads			<ul style="list-style-type: none"> ADB approval of contract awards Construction of temporary works and service roads 	
3.3 Construction of civil works, by December 2002			<ul style="list-style-type: none"> Implementation according to contract schedule 	

Activities – Milestones	Inputs
3.4 Environmental protection and mitigation measures	<ul style="list-style-type: none"> • Implementation of mitigation measures recommended in EIA and SEIA • Monitoring by GDIES
3.5 Procurement of equipment	<ul style="list-style-type: none"> • ADB approval of bidding documents • Bid invitation • Evaluation of bids • Contract awarding
4.0 Computerization of MIS and FAS, and training of GSRC staff	<ul style="list-style-type: none"> • Hiring of consultants • Design of MIS and FAS
5.0 Construction and upgrading of link roads to poor inland areas	<ul style="list-style-type: none"> • Commitment of local governments • Construction of link roads by local governments
6.0 Development of basic physical and social infrastructure	<ul style="list-style-type: none"> • Development of education, health, electricity, agricultural extension, and communications infrastructure • Commitment of provincial and local governments. • Monitoring by GSSA

ADB = Asian Development Bank, EIA = environmental impact assessment, FAS = Financial Accounting System, FIRR = financial internal rate of return, GDIES = Guizhou Designing Institute of Environmental Sciences, GSRC = Guizhou Shuibai Railway Corporation, GSSA = Guizhou Social Sciences Academy, ITC = China International Tendering Company, MIS = Management Information System, SEIA = summary environmental impact assessment.

CHRONOLOGY OF MAJOR EVENTS IN THE PROJECT'S HISTORY

Year	Date	Activity
1997	1 October	– Start of loan fact-finding mission
1998	13 February	– Management review meeting; approval of advance procurement action
1998	17 February	– Start of loan appraisal
1998	18 March	– Signing of agreement between GSRC and GDIES for environment monitoring and supervision
1998	28 March	– Signing of agreement between GSRC and GSSA for resettlement monitoring and supervision
1998	15 April	– Signing of concession agreement between Guizhou Shuibai Railway Corporation and Chengdu Railway Administration Bureau
1998	29 June	– Start of loan negotiations
1998	18 August	– Loan approval
1998	14 October	– Bid opening date for procurement of civil works packages
1998	3 November	– Start of inception mission
1998	10 December	– Approval of change in implementation arrangements
1998	18 December	– ADB approval of bid evaluation report for civil works
1999	23 February	– Loan signing
1999	24 May	– Loan effectivity
2000	19 July	– Start of midterm review of the Project
2001	19 June	– First partial cancellation of loan proceeds
2002	11 September	– Turnover of Project to CRAB
2002	26 September	– Opening ceremony for the Project
2002	13 November	– MOR announcement No. [2002] 1363 opening freight transport on the Shuibai Railway Line
2002	20 November	– Effectivity of commercial tariff notification
2002	1 September	– Start of trial operation
2003	12 September	– Final reallocation of loan proceeds
2003	11 June	– Approval of extension of loan closing date
2003	30 June	– Original closing date
2004	1 March	– Start of freight operations
2004	15 March	– Final disbursement and actual closing date
2004	31 October	– Asset recomposition of Guizhou Shuibai Railway
2005	1 February	– Start of passenger operations
2005	10 April	– Start of Project completion review mission

ADB = Asian Development Bank, CRAB = Chengdu Railway Administration Bureau, GDIES = Guizhou Designing Institute of Environmental Sciences, GSRC = Guizhou Shuibai Railway Corporation, GSSA = Guizhou Social Sciences Academy, MOR = Ministry of Railways.

DETAILS OF CONTRACT PACKAGES

Item	Method	ADB Con.	Cont. Rcvd.	Advice of PCSS Nos.	ACTUAL		Orig. Amount (in CNY)	ADB Financing (plus variations)	Dollar Equivalent	Disbursement (\$)	Contract Balance
					Contractor	PCSS					
A. Civil Works (50% ADB Financing)											
Construction Section 1	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 12th Engineering Bureau, MOR, Shanxi Province	0001	75,672,269.00	57,143,494.39	6,906,278.00	6,906,278.00	-
Construction Section 2	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 2nd Dept of the Tunnel, Hebei Province	0002	95,012,242.00	65,950,052.47	7,970,449.00	7,970,449.00	-
Construction Section 3	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 19th Engineering Bureau, MOR, Liaoning Province	0003	133,964,366.00	96,650,084.50	11,679,730.00	11,679,730.00	-
Construction Section 4	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 15th Engineering Bureau, MOR, He'nan Province	0004	103,551,398.00	85,806,836.97	10,369,082.00	10,369,082.00	-
Construction Section 5	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 14th Engineering Bureau, MOR, Shandong Province	0005	144,823,388.00	99,494,482.37	12,024,597.00	12,024,597.00	-
Construction Section 6	ICB	16/Dec/98	25/Jan/99	2/Jan/99	The 5th Engineering Bureau, MOR, Guizhou Province	0006	144,421,276.00	91,152,051.09	11,015,490.00	11,015,490.00	-
							697,444,939.00	496,197,001.78	59,965,626.00	59,965,626.00	-
B. Signalling, Telecom, Electrification (100% ADB financing)											
Lot 3-1: Transformers (12 sets)	IS	7/Sep/01	3/Oct/01	4/Oct/01	Shanxi Grand Coalchem Indl, Taiyuan	0035	US\$706566	706,566.00	669,616.00	669,616.00	-
Lot 3-2: Switches (125 sets)	ICB	7/Sep/01	3/Oct/01	4/Oct/01	CCECC International Trading Co., Haidan district	0036	2,374,698.55	2,374,698.00	285,663.00	285,663.00	-
Lot 3-3: Secondary Equipment of Traction	ICB	7/Sep/01	3/Oct/01	4/Oct/01	Acheng Relay Co., Ltd., Heilongjiang	0037	3,651,258.00	3,651,258.00	441,142.00	441,142.00	-
Lot 3-4: Transformers, Lighter Protectors	ICB	11/Sep/01	3/Oct/01	4/Oct/01	China Electric Power Tech, Xicheng District, Beijing	0038	US\$195,105	195,105.00	195,105.00	195,105.00	-
Lot 3-5 Contact System Wires and Materials	ICB	7/Sep/01	3/Oct/01	4/Oct/01	Shandong Mach. & Eqpt. I/E Group Co, Qingdao	0039	US\$533,050	533,050.00	533,028.00	533,028.00	-
Lot 3-6: Cross Web Member Type Pre-stressed	ICB	7/Sep/01	3/Oct/01	4/Oct/01	CCECC International Trading Co., Haidan district	0040	2,510,304.00	2,510,304.00	289,337.00	289,337.00	-
Lot 3-7: Automatic Split-phase Device (1 set)	ICB	7/Sep/01	3/Oct/01	4/Oct/01	China National Overseas Eng. Corp., Beijing	0041	1,119,800.00	1,119,800.00	135,294.00	135,294.00	-
Lot 3-8: Contact System Parts (1 lot)	ICB	7/Sep/01	3/Oct/01	4/Oct/01	Beijing Kaishengao I/E Co. Ltd.	0042	1,579,938.48	1,579,938.00	152,733.00	152,733.00	-
									2,701,918.00	2,701,918.00	-
C. Materials (100% ADB financing)											
Package 1, ordinary Portland cement (45000 T)	ICB	6/May/99	7/Jun/99	9/Jun/99	Jenka Industries Limited, Wanchai	0007	(in USDollars)	1,612,800.00	1,612,800.00	1,612,800.00	-
Package 2, ordinary Portland cement (35000 T)	ICB	6/May/99	7/Jun/99	9/Jun/99	China Railway Materials & Supplies, Beijing	0008	1,083,950.00	1,083,950.00	1,083,950.00	1,083,950.00	-
Package 3, ordinary Portland cement (14000 T)	ICB	6/May/99	7/Jun/99	9/Jun/99	China National Building Materials, Beijing	0009	530,180.00	530,180.00	530,180.00	530,180.00	-
Package 4, ordinary Portland cement (6000 T)	ICB	6/May/99	7/Jun/99	9/Jun/99	China National Building Materials, Beijing	0010	227,220.00	227,220.00	227,220.00	227,220.00	-
Package 1, ordinary Portland cement (82,500 T)	ICB	20/Aug/99	11/Nov/99	18/Nov/99	Hainan Provincial Machinery & Equipment, Haikoi, Hainan	0011	2,433,750.00	2,431,532.80	2,431,533.00	2,431,533.00	-
Package 2, ordinary Portland cement (70,000 T)	ICB	20/Aug/99	11/Nov/99	18/Nov/99	Guida company Limited, Wanchai, Hongkong	0012	2,347,100.00	2,347,100.00	2,347,100.00	2,347,100.00	-
Package 4, ordinary Portland cement (13,000 T)	ICB	20/Aug/99	11/Nov/99	18/Nov/99	Guida company Limited, Wanchai, Hongkong	0013	459,550.00	459,550.00	459,550.00	459,550.00	-
Package 3, ordinary Portland cement (24,500 T)	ICB	20/Aug/99	11/Aug/99	18/Aug/99	China National Building Materials, Beijing	0014	933,450.00	933,450.00	933,450.00	933,450.00	-
Package 2, Hot-rolled plain round steel bar	ICB	1/Oct/99	10/Dec/99	14/Dec/99	Kunming Iron & Steel Corp, Kunming, Yunnan	0015	825,500.00	813,042.86	813,043.00	813,043.00	-
Package 4, Hot-rolled, ribbed steel	ICB	9/Nov/99	10/Dec/99	14/Dec/99	Kunming Iron & Steel Corp, Kunming, Yunnan	0017	844,220.00	841,570.80	841,571.00	841,571.00	-
Package 5, Hot-rolled, plain round steel bar	ICB	1/Oct/99	10/Dec/99	14/Dec/99	Kunming Iron & Steel Corp, Kunming, Yunnan	0018	773,300.00	770,682.17	770,682.00	770,682.00	-
Package 1, Hot-rolled ribbed steel	ICB	9/Nov/99	10/Dec/99	14/Dec/99	Kunming Iron & Steel Corp, Kunming, Yunnan	0020	844,220.00	844,220.00	840,753.00	840,753.00	-
Package 1, Rails (5,979 pcs) & joint attachment	ICB	7/Aug/00	25/Sep/00	27/Sep/00	Pangang Group Intl., Sichuan	0021	3,798,732.08	3,798,732.08	3,785,181.00	3,785,181.00	-
Package 2, Rails (9,296 pcs) & joints (107,038)	ICB	7/Aug/00	25/Sep/00	27/Sep/00	Shenzhen Sunray Group, Shenzhen	0022	5,991,625.95	5,991,625.95	5,980,786.00	5,980,786.00	-
Package 3, Spring Clip and Buckle fastenings	ICB	24/Jul/00	25/Sep/00	27/Sep/00	China Export Bases Devt., Chongqing	0023	529,001.00	529,001.00	436,692.00	436,692.00	-
Package 4, Spring Clip and Buckle fastenings	ICB	24/Jul/00	25/Sep/00	27/Sep/00	China Export Bases Devt., Chongqing	0024	787,845.00	787,845.00	688,511.00	688,511.00	-
Package 5, Lateral Turnouts, 28 group	ICB	24/Jul/00	25/Sep/00	27/Sep/00	CCECC Intl. Trading Co., Haidan District, Beijing	0025	197,517.00	197,517.00	197,517.00	197,517.00	-
Package 6, Lateral Turnouts, 25 group	ICB	14/Jul/00	25/Sep/00	27/Sep/00	CCECC Intl. Trading Co., Haidan District, Beijing	0026	175,409.00	175,409.00	175,409.00	175,409.00	-
Package 1, Ordinary Portland cement	ICB	25/Jan/01	12/Dec/00	25/Jan/01	Shenzhen Sunray Group, Shenzhen	0030	98,790.00	98,790.00	98,790.00	98,790.00	-
Package 2, Ordinary Portland cement	DP	25/Jan/01	12/Dec/00	25/Jan/01	China National Building Materials, Beijing	0031	99,630.00	99,630.00	99,630.00	99,630.00	-
Ordinary Portland Cement (14,000 MT)	IS	25/Jan/01	8/Feb/01	15/Feb/01	China National Building Materials, Beijing	0032	516,600.00	516,600.00	516,600.00	516,600.00	-
Ordinary Portland Cement (14,000 MT)	IS	25/Jan/01	8/Feb/01	15/Feb/01	China Railway Materials, Beijing	0033	450,520.00	450,520.00	450,520.00	450,520.00	-
Ordinary Portland Cement (14,000 MT)	IS	25/Jan/01	8/Feb/01	15/Feb/01	China National Building Materials, Beijing	0034	445,900.00	445,900.00	318,190.00	318,190.00	-
Package 1, Communication Cable-1	ICB	17/Dec/01	20/Dec/01	11/Jan/02	CCECC Intl. Trading Co., Haidan District, Beijing	0043	387,180.19	387,180.19	374,943.00	374,943.00	-
Package 2, Communication Cable-2	IS	17/Dec/01	20/Dec/01	11/Jan/02	CCECC Intl. Trading Co., Haidan District, Beijing	0044	152,370.63	152,370.63	151,111.00	151,111.00	-
Package 3, Communication Eqpt (135 sets)	IS	17/Dec/01	20/Dec/01	11/Jan/02	CCECC Intl. Trading Co., Haidan District, Beijing	0045	76,130.35	76,130.35	75,590.00	75,590.00	-
Package 4, Radio Train Dispatching System	IS	17/Dec/01	20/Dec/01	11/Jan/02	Delam Europa GMBH, Germany	0046	444,580.39	444,580.39	444,580.00	444,580.00	-
							27,067,071.59	27,047,130.22	26,685,882.00	26,685,882.00	-
D. Consulting Services (100% ADB Financing)											
Consulting Services for Computerization	IS	16/Jul/02	6/Sep/02	25/Oct/02	Transportation & Econ (TERA), USA	0047	399,607.00	399,607.00	399,607.00	399,607.00	-
E. Capitalization (Interest & Commitment Charge)											
								15,246,967.00	15,246,967.00	15,246,967.00	-
Total									105,000,000.00	105,000,000.00	-

ICB = international competitive bidding, IS = international shopping, DP = direct purchase, MOR = Ministry of Railways.

Note: PCSS 0016 and 0019 were terminated due to supplier's inability to deliver the goods on time.

PCSS 0027, 0028, & 0029 were terminated because they were ordinary Portland cement.

PROJECT COSTS AND FINANCING SOURCES
(\$ million)

Table A4.1: Project Cost

Component	Appraised			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Base Cost						
1. Railway-civil works	104.4	110.6	215.0	116.0	122.9	238.9
2. Railway trackwork (including rails, sleepers, ballasts)	14.2	22.7	36.9	17.6	28.4	46.1
3. Buildings and facilities	1.5	6.2	7.7	0.8	3.4	4.2
4. Signaling, telecommunications, electrification, and operational equipment	13.5	18.4	31.9	15.4	20.9	36.3
5. Land acquisition, compensation, and resettlement	0.0	4.4	4.4	0.0	8.7	8.7
6. Administration, consulting services, and miscellaneous costs	0.4	15.4	15.8	0.4	27.2	27.6
Subtotal - A (Base Cost)	134.0	177.7	311.7	150.3	211.5	361.8
B. Contingencies						
1. Physical	11.5	15.1	26.6	0.0	0.0	0.0
2. Price	7.2	9.0	16.2	0.0	0.0	0.0
Subtotal - B	18.7	24.1	42.8	0.0	0.0	0.0
C. Interest during construction and other charges						
	17.4	9.1	26.5	15.3	15.5	30.8
Subtotal - C	17.4	9.1	26.5	15.3	15.5	30.8
Total (A+B+C)	170.1	210.9	381.0	165.6	227.0	392.6

Source: Guizhou Shuibai Railway Corporation estimates on PCR.

Table A4.2: Financing Sources

Source	Appraised			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
ADB	140.0	0.0	140.0	105.0	0.0	105.0
GSRC	30.1	138.6	168.7	60.6	154.4	215.0
SDB	0.0	72.3	72.3	0.0	72.6	72.6
Total	170.1	210.9	381.0	165.6	227.0	392.6

ADB = Asian Development Bank, GSRC = Guizhou-Shuibai Railway Corporation, SDB = State Development Bank.

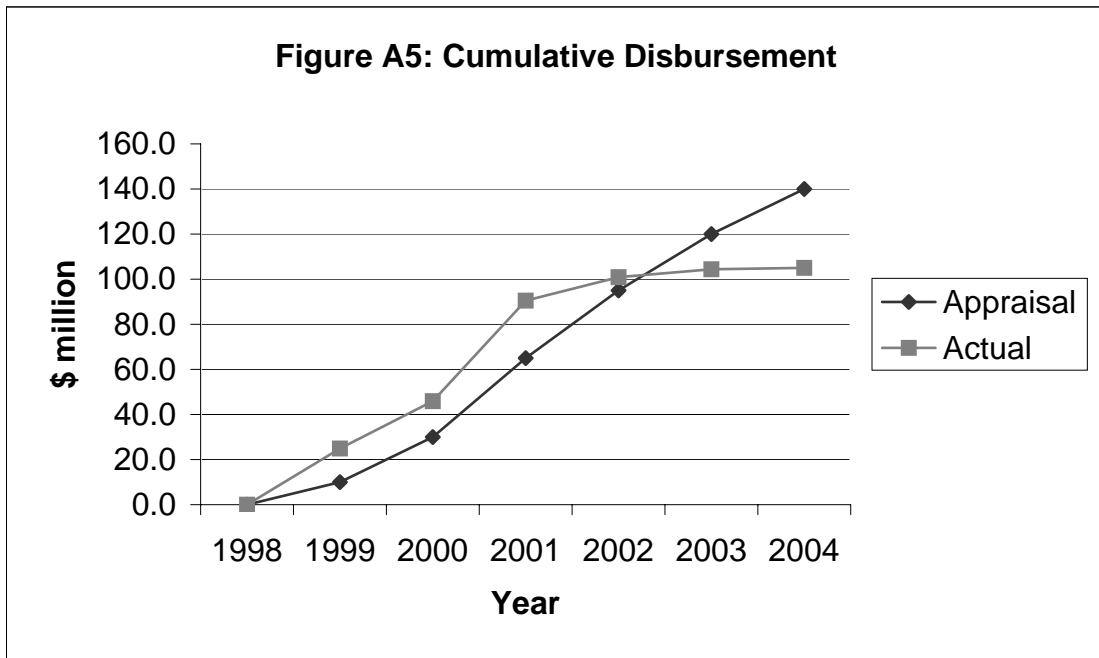
Source: Guizhou Shuibai Railway Corporation estimates on PCR.

APPRAISAL AND ACTUAL DISBURSEMENT SCHEDULES

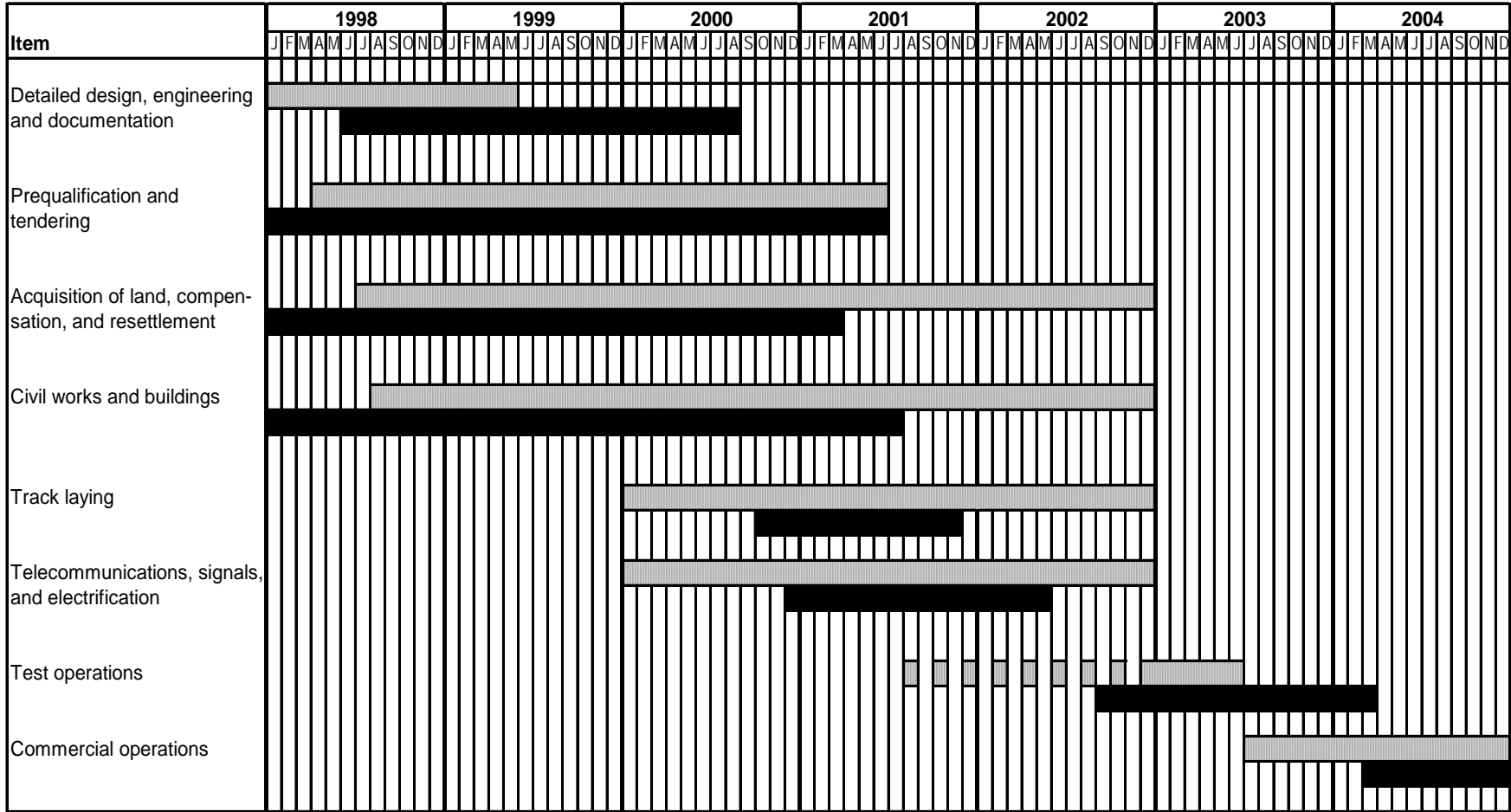
Table A5: Disbursement Schedule
(\$ million)

Year	Appraisal	Actual	Cumulative	
			Appraisal	Actual
1998	0.0	0.0	0.0	0.0
1999	10.0	24.9	10.0	24.9
2000	20.0	21.0	30.0	45.9
2001	35.0	44.6	65.0	90.5
2002	30.0	10.4	95.0	100.9
2003	25.0	3.5	120.0	104.4
2004	20.0	0.6	140.0	105.0
Total	140.0	105.0		

Source: Asian Development Bank.



PLANNED AND ACTUAL IMPLEMENTATION SCHEDULE



Appraisal:

Actual:

EVALUATION OF LAND ACQUISITION AND RESETTLEMENT ACTIVITIES

A. Background

1. In October 1997, a resettlement plan was prepared by the project preparatory technical assistance (PPTA) consultants for affected residents of Zhongshan District, Shuicheng County, and Panxian County of Liupanshui Municipality, all of which were along the 118.58-kilometer (km) railway connecting Liupanshui and Baiguo. Resettlement implementation, monitoring, and evaluation were based on the plan, which was approved by ADB.

B. Scope of Land Acquisition and Resettlement

2. At appraisal, it was estimated that about 434.47 ha of land would be acquired for the construction of the railway and 124.13 ha for temporary occupation. When the land was acquired, the compensation was based on permanent acquisition, even for the temporarily acquired land. At project completion, 539.75 ha of land had been permanently acquired or temporarily occupied for railway construction, 3% less than the total stated in the resettlement plan. The main reason for this decrease was that the plan estimates were based on the feasibility study while the actual land acquisition was based on the detailed design. Table A7.1 compares the planned and actual resettlement activities.

Table A7.1: Resettlement Plan and Implementation Compared

Impact of Resettlement	RP (1997)	Actual (2001)	Difference	Rate (%)
1. Land acquisition (hectares)				
(i) Permanent	434.47	539.75	(18.85)	(3)
(ii) Temporary	124.13			
2. House demolition (square meters)				
(i) Dwelling demolition	37,774	98,042	60,268	160
(ii) Factory and institution demolition	Included in above	10,102	10,102	
3. People affected				
(i) by land acquisition				
Household	615	7,925	7310	1,188
Person	2,466	29,653	27,187	1,102
(ii) by dwelling demolition				
Household	615	1,073	458	74
Person	2,466	4,364	1,898	77

RP = resettlement plan.

Sources: Guizhou Shuibai Railway Corporation, Guizhou Social Sciences Academy, and Resettlement Plan.

3. The acquisition of 539.75 hectares (ha) of land affected 29,653 persons in 7,925 households.¹ Table A7.2 shows the different types of land acquired and the people affected by the land acquisition.

Table A7.2: Land Acquisition by County/District

	County/District			Total
	Zhongshan	Shuicheng	Panxian	
Irrigated land (ha)	0.80	21.33	6.94	29.07
Dry land (ha)	9.27	246.50	80.16	335.93
Vegetable land (ha)	0.18	4.76	1.55	6.49
Total cultivated land (ha)	10.25	272.59	88.65	371.48
Affected households	219	5,815	1,891	7,925
Affected persons	818	21,759	7,076	29,653
Forest land (ha)	0.60	15.94	5.18	21.72
Waste land (ha)	3.52	93.66	30.46	127.64
Other land (ha)	0.52	13.87	4.51	18.90
Total forest/waste land (ha)	4.64	123.47	40.15	168.26
Total land acquisition (ha)	14.89	396.06	128.80	539.75

ha = hectare.

Sources: Guizhou Shuibai Railway Corporation and Guizhou Social Sciences Academy.

4. The affected houses can be divided into two categories according to ownership type: (i) personal (family) dwellings, and (ii) buildings owned by factories or public institutions. Demolished dwellings totaled 98,042 square meters (m²), about 160% higher than the plan figure. The main reason for this increase was design changes realignment and conservative assessments. The people affected by the demolition totaled 4,364, 74% higher than the 2,466 in the resettlement plan. Demolished factory buildings and public institutions totaled 10,102 m² whereas none had been anticipated in the plan. As already mentioned, the plan was based not on the final alignment but on the feasibility study.

C. Applied Laws and Regulations, and Compensation Standards

5. The land acquisition and resettlement were implemented according to the following laws and regulations:

- (i) The Law of Land Administration of the People's Republic of China (passed by the 16th session of the 6th National Congress in June 1986, and revised by the 5th session of the 7th National Congress in December 1988);

¹ The estimates of affected households (615) and persons (2,466) in the resettlement plan were arrived at by dividing the farmland area to be acquired for the railway by the average farmland per capita. This meant that the equivalent of 2,466 persons (including dependents) would lose their farm livelihood (total loss of land was assumed for each person). In reality, for many people, railway projects affect only a small portion of their land as the railway crosses a village (typically 10% loss on average). The Ministry of Railways has reported that 7,925 households lost some land and therefore received compensation.

- (ii) The Guizhou Provincial Implementation Regulations of the Law of Land Administration of the People's Republic of China; and
- (iii) The notification (No. 75 of 1997) of land acquisition and house relocation for the construction of the Guizhou Shuibai Railway (issued by the Liupanshui municipal government).

6. The resettlement plan specified different compensation standards for the various categories of affected land. During the implementation, compensation for all types of land was paid at a unit rate in each county or district. On the basis of the total land acquired and the compensation paid, the actual average land compensation rates were higher than the average rates in the plan. Table A7.3 compares the land compensation rates.

Table A7.3: Planned and Actual Land Compensation Rates Compared

Item	Compensation rate in the Resettlement Plan (CNY)	Compensation Rate in Zhongshan and Baiguo Town of Panxian ^a (CNY)	Compensation Rate in Other Parts of Panxian (CNY)	Compensation Rate in Shuicheng (CNY)
Irrigated land	3,583	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class
Residential land	4,835	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class
Dry land	1,080	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class
Forest land	816	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class
Orchard	2,721	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class
Waste land	635	about 5,580	3,720	2,900, 3,100, or 3,300 according to land class

^a Rate is 50% higher than elsewhere in Panxian.

Sources: Guizhou Shuibai Railway Corporation, Guizhou Social Sciences Academy, and field visit.

7. The resettlement plan specified compensation standards for brick concrete (CNY415/m²) and brick timber houses (CNY170/m²). However, the actual house compensation rates were much lower. Compared with those for other similar ADB-funded projects, the compensation rates were reasonable. The rates in the plan were too high (Table A7.4).

Table A7.4: Planned and Actual House Compensation Rates Compared

Item	Compensation Rate in Resettlement Plan (CNY)	Actual Rate		
		Guizhou Shuibai Project (CNY)	Chongqing Expressway Project (CNY)	Chengdu-Nanchong Expressway Project (CNY)
Brick concrete house	415	140–210	80–160	80–210
Brick timber house		105–145	70–110	60–120
Timber tile house	170	60–140	90–110	40–80

Sources: Guizhou Shuibai Railway Corporation, Guizhou Social Sciences Academy, and field visit.

D. Resettlement Organizations

8. The Guizhou Shuibai Railway Corporation (GSRC) assigned staff to take charge of the land acquisition and resettlement. The Liupanshui Municipality and the three affected local governments set up resettlement offices (supporting the railway offices) to coordinate resettlement in the townships, while similar offices in the 14 affected townships coordinated resettlement at the village and household level. There was at least one woman member in every township resettlement coordinating team. Women's federation at provincial, prefecture, county, and township level, were also involved in implementing of resettlement plan. The civil construction contractors also assigned staff to process matters related to land acquisition and resettlement.

E. Resettlement Budget and Payment

9. The actual total cost of land acquisition, house relocation, and affected electric and telecommunication facilities was CNY71.6 million, 43% higher than the CNY50.1 million estimated in the resettlement plan because of differences between the preliminary design and the detailed design. The total cost comprised CNY33.4 million for land, CNY25.9 million for houses and auxiliary structures, and CNY12.3 million in other costs. The resettlement budget and actual payments are shown in Table A7.5.

Table A7.5: Resettlement Budget Estimate and Actual Payments
(CNY'000)

Item	RP (1997)	Actual (2001)	Difference	Change (%)
Land	40,529	33,415	(7,114)	(18)
Houses and auxiliary structures	8,064	25,914	17,850	221
Other land attachments	279	12,271	10,752	708
Other	1,240			
Total	50,112	71,600	21,488	43

Sources: Guizhou Shuibai Railway Corporation and Guizhou Social Sciences Academy.

10. The GSRC allocated resettlement funds to Liupanshui Municipality, which paid out the funds to affected village groups and households through the counties and townships. The compensation for temporary land occupation was paid directly to the affected households by each civil construction contractor. The compensation rate for temporary land occupation was the

same as that paid for permanent land acquisition, and the costs of temporary land occupation were included in the total resettlement costs.

F. Resettlement

11. In August 1997, measurement of land and buildings and facilities to be acquired began. November of that same year marked the start of land acquisition and the relocation of housing and buildings. The compensation contracts were signed during the same period. By 1999, most of the land acquisition and housing relocation had been completed and most of the affected infrastructure had been restored or rebuilt. But with the progress of the civil construction, a small amount of sporadic land acquisition and house demolition lasted until 2001.

12. The resettlement activities for land acquisition were implemented at village and village group level. Nearly all the affected villages and village groups decided to give all of the compensation for cultivated land and resettlement in cash to the affected households. Most of the villagers had decided that this was the way to distribute the payment. The villages were generally satisfied with the way the payments were handled.

13. House relocation started in November 1997. The new housing plots were provided free of charge by the villages or village groups. The new houses were built according to the expectations of the relocated households. Field investigations revealed that the new houses were usually ready three months after the old ones were demolished. However, since transitional and moving allowances were not stipulated in the resettlement plan, no such allowances were paid to the relocated households.

14. The new houses were generally better in style and quality than the old houses, resulting in an improvement in the living conditions of those relocated. The villagers generally preferred to build larger and better houses by using part of their savings or borrowing from relatives and friends to supplement the housing compensation funds.

15. The enterprises and public institutions affected by the Project were mainly village schools, small clinics, and small enterprises. There was detailed consultation on the compensation for the demolished buildings owned by factories or public institutions. Payment covered the compensation fee, additional compensation for affected structures and attachments, moving costs, replacement land costs, and other losses. This compensation was paid directly to the affected factories or public institutions. For instance, because the Songhe Township Central School in Panxian County was only 20 meters away from the railway, the Project paid the school about CNY350,000 for 300 square meters of old buildings and other losses, including moving and transitional allowances. The new 1,900-square-meter, four-story brick concrete buildings for the school were finished in September 2002. The old single-story brick timber houses are still used as teachers' dormitories. The new school now has 17 classes, 36 teachers, and 1,038 students compared with 9 classes, 16 teachers, and 500 students in the old school. The school president and the township leader are satisfied with the compensation fees they received.

G. Assessment of the Quality of Resettlement and Rehabilitation

16. Site visits and investigations during the project completion review mission found that the affected households were relocated with their original village groups to keep the social and economic relationships intact. The size and structure of the new houses were better. Necessary infrastructure such as village roads and house plots were provided free of charge. While the

housing compensation was adequate for building a new house of the same structure and quality, the affected people tended to invest some of their own funds to have a better house. Most relocated households were satisfied with the relocation arrangement.

17. For affected factories and public institutions, additional assistance beyond the standard compensation was provided. Especially for public institutions, such as schools, the extra funds were provided so that a better building could be built. For affected infrastructure, additional compensation above the amount budgeted in the resettlement plan was paid so that the infrastructure could be restored or rebuilt quickly.

18. The affected area is rich in coal resources. More than half of the rural workers sought better jobs outside their villages or engaged in non-agricultural tasks such as coal mining. On average, each of those villagers earns at least CNY6,000 per year. Work outside the village has become most important source of their income, and more than 70% of the farmers' household income comes from non-agricultural sources. Land acquisition did not cause any marked decrease in household incomes. The compensation for land given to the affected farmers in cash provided them with new opportunities to work in orchards and find other work in agriculture. Contractors provided employment opportunities to the affected farmers for low-skilled labor such as earth works. On average, the daily wage was at least CNY20. This construction employment helped to increase the income of the affected people.

H. Consultation, Monitoring, and Evaluation

19. In August 1997, before the resettlement, mobilization campaigns were held in all villages and among all village groups that would be affected. During the resettlement, land compensation allocation programs were settled in consultation with the affected villagers. Resettlement sites and methods of the relocated residents and enterprises and institutions were identified after consultation.

20. The GSRC engaged an independent resettlement monitoring agency, the Guizhou Academy of Social Sciences (GSSA), to do the external monitoring work. Between 1998 and 2001, five resettlement monitoring reports, were prepared and submitted to ADB by GSSA. The monitoring reports described the resettlement organizations, consultation, compensation standards, and income restoration activities. GSSA also finished and submitted to ADB six monitoring reports on the ethnic minorities, poverty reduction, and social development.

I. Conclusion and Lessons Learned

21. The PCR mission interviewed representatives of two affected villages and one affected school. These villages and school are now in a better condition than before. The affected households have obtained compensation for house demolition and land acquisition on the basis of replacement costs. From the findings of the PCR mission, it can be concluded that the resettlement was implemented mainly according to the plan, though actual compensation rates for land and houses were often different from the rates in the plan. The objectives stated in the resettlement plan have been achieved

22. The resettlement activities were carried out by a well-established resettlement organization involving the GSRC (project level), municipalities (prefecture level), districts/counties, townships, villages, and village groups. Resettlement was closely linked to project construction, and cooperation from local governments was encouraged. The resettlement agencies were well coordinated and operated well.

23. Before and during the resettlement, the affected people were consulted and informed about the compensation policies, and their resettlement options were taken into consideration. All the affected groups and individuals have been paid compensation. All the relocated households that wished to build new houses have done so at no cost to themselves. The affected facilities and infrastructure have been restored or rebuilt.

24. Through the efforts of the resettlement offices and local governments at all levels, the affected farmers have been compensated according to the option preferred by most villagers. Since 1999, more and more villagers have found work in the outside agriculture such as coal mining. Land acquisition did not significantly reduce their incomes, only a small part of which was derived from agriculture. Instead, their incomes have generally improved and earning capacity has been strengthened.

25. For ADB, the main lessons from the Project are as follows:

- (i) The RP should specify feasible compensation standards for all the affected categories, especially for important items such as land and dwellings and other buildings. Otherwise, it will be difficult to gauge whether or not the compensation standards conform to the agreement between ADB and the Borrower.
- (ii) Data collection should be systematic and timely, and should include details about the affected land, dwellings and important land attachments, and people, to allow a more comprehensive review and assessment during the project completion review.

ENVIRONMENTAL IMPACT ANALYSIS

A. Introduction

1. The Project is in the eastern part of the Yungui Plateau, where there are high mountains and lofty peaks, and complex geological conditions. The project area has an elevation of between 1,800 meters (m) and 2,500 m, rising from southeast to northwest. The railway route runs through many steep mountains and deep valleys. The geological structures along the railway are complex and contain a combination of multi-structural systems. The main structural characteristics commonly seen are karst, landslides, collapses, rock accumulations, mud flows, soft soil, artificial coal pits, and gases. The karst landscape is especially well developed and has valleys, funnels, sinkholes, subterranean rivers, and limestone caves. The most widely distributed soil types are yellow and brown soil, yellow soil, purple soil, and paddy rice soil.

2. The project area belongs to the subtropical climate zone, dry and cold in winter and spring, wet and mild in summer and autumn. The average annual temperature is 13–14°C. The average annual rainfall is 1,200–1,500 millimeters (mm). The prevailing wind blows from the southwest to northeast, with a mean velocity of 1.6–2.5 meters per second. The railway crosses three main rivers in the project area. They are the Balang, Beipan, Xiangshui, and they belong to two major river systems, namely, the Zhujiang (Pearl River) and the Changjiang (Yangtze River). Deep riverbeds and large head drops characterize these mountain rivers, providing abundant hydropower reserves.

3. Along the railway, land of lower gradient (with a slope of less than 10 degrees) accounts for only 25% of the dry land, whereas that with higher gradient (with a slope of 10 degrees and above) makes up 75%. The forest cover is only 3.9% of the land area. Common tree species are pine, China fir, cypress, birch, and poplar. There are no significant natural habitats, cultural properties, tourist sites, or other environmentally sensitive spots in the areas immediately adjacent to and directly affected by the Project.

4. In December 1993, an environmental impact assessment (EIA) of the Project was prepared by the Second Survey & Design Institute (SSDI) of the Ministry of Railways (MOR). During project appraisal, a summary environmental impact assessment (SEIA) was prepared by the PPTA consultants, circulated to ADB's Board of Directors, and made public. The final alignment was selected to minimize construction costs, resettlement costs, and adverse environmental impact.

B. Environmental Management

5. The Guizhou Shuibai Railway Company (GSRC) is responsible for environmental management and supervision for the Project. During construction, the designated personnel, with the help of the environmental consultants, were in charge of the mitigation measures prepared during the EIA. The personnel reviewed the environmental monitoring reports, responded to any adverse environmental impacts, supervised the contractors and construction supervision companies, and reported and connected with the relevant agencies and ADB. All important environmental matters and decisions were referred directly to the top management of GSRC. At the request of GSRC, each contractor and construction supervision company designated staff from the site management team to deal with environmental issues.

6. In the operating stage, GSRC has paid constant attention to environmental management. The designated personnel still take charge of implementing further mitigation measures, carrying out routine maintenance of environmental facilities, and controlling pollution.

C. Environmental Monitoring

7. Environmental monitoring took place at two levels: daily environmental monitoring, by the contractors and construction supervision companies on the site, and periodic environmental monitoring, by specialist staff, who took samples and analyzed them according to the monitoring procedures and guidelines.

8. The Guizhou Designing Institute of Environmental Sciences (GDIES) was assigned to carry out the environmental sampling and analysis, and perform environmental monitoring. GDIES monitored noise pollution, ambient air quality, surface water quality, and the ecological environment, verified the EIA evaluation, and implemented the mitigation plan. GDIES staff visited the site for periodic environmental monitoring and inspection, gave guidance and advice on environmental monitoring, trained project staff, planned the implementation of mitigation measures, and reported their findings. Between 1998 and 2003, GDIES submitted 23 quarterly and annual environmental monitoring reports to GSRC and ADB. The formal monitoring served as a legal basis for confirming compliance with environmental regulations.

D. Implementation of Mitigation Measures

9. During implementation, environmental monitoring and mitigation measures were carried out according to the EIA and SEIA. The following main measures have been taken to minimize adverse environmental effects:

- (i) Using spoils from tunnels and other places in building embankments or railway stations, and moving the unused spoils into nearby valleys with retaining walls to prevent them from being dumped into rivers;
- (ii) Dealing promptly with unstable slopes to avert landslides and erosion;
- (iii) Planting more than 70,000 square meters of plants on the embankment slopes and about 530 multiple units (mu)¹ (35.3 hectares [ha]) of trees along the railway;
- (iv) Transferring around 300 mu (20 ha) of land leveled for temporary use to local farmers for replanting;
- (v) Building ditches or conduits to drain waste water;
- (vi) Using low-noise and low-pollution machines;
- (vii) Limiting working time at construction sites near villages or other inhabited areas;
- (viii) Training supervisors to deal with gas in tunnels, purchasing gas detection equipment, attaching importance to ventilation while tunneling, and using explosion-proof machines in tunnels; and
- (ix) Further revising and perfecting the design of culverts and other drainage structures to avoid damaging the local draining system.

E. Environmental Impact

1. Noise

10. Noise monitoring points were selected in accordance with the EIA, and the distribution of representative sensitive receptors. During construction, the monitoring results showed that the noise level varied with the stage of construction and the machinery used. Since the Project is located in mountainous areas with fewer people, the noise from the construction had only a limited effect on the residents along the railway alignment, besides, the contractors adopted noise mitigation measures such as using only low-noise equipment at night. The environmental authorities and GDIES received no complaints from the public about noise from the project site.

¹ 1 mu = 0.0667 ha.

11. In the operating stage, the noise level in the seven stations along the railway is between 52.5 and 57.7 decibels. This level meets the class III standard (GB 3096-1993), and the acoustic environment is good.

2. Environmental Air

12. During construction, the coal used in the project areas had less than 2% sulfur content. Smoke was first purified of dust particles before being discharged, and in the less sparsely populated mountainous areas where the Project is located, the smoke was quickly diffused, and it had minimal effect on air quality.

13. In the operating stage, electric heaters have taken the place of coal-fired boilers, and electric locomotives have taken the place of oil-fired locomotives, reducing air pollution. The values for sulfur dioxide, nitrogen oxides, and trisodium phosphate can meet the class II standard (GB 3095-1996) for ambient air quality.

3. Surface Water

14. During construction, sewage discharged along the construction line was mainly the live sewage from the contractors. When oxidized in the ditch, the sewage attained a concentration that could meet the Standard for Irrigation Water Quality (GB 5084-1992).

15. In the operating stage, the water pollutants were mainly the live sewage from the seven stations. The results from the monitoring of water quality showed that the discharge from drains or channels along the railway has had hardly any impact on the water quality of the receiving rivers.

4. Ecological Environment

16. During construction, the contractors carried out the environmental protection provisions in their contracts and designed residue ground according to the principle of building residue-retaining walls first before accumulating residue. So soil erosion was controlled, and the construction did not adversely affect the surrounding environment.

17. In the operating stage, possible ecological problems in the project areas, such as water and soil erosion, landslip, and mud-rock flow, have been controlled through appropriate design and management. There have been no significant changes in forest coverage, extent of water and soil erosion, percentage of paddy field in cultivated land, percentage of steep slope, and percentage of naked land—the five main indices of environmental quality.

F. Conclusions

18. During construction, the contractors for all contracted sections fulfilled their obligation to protect the environment and to implement mitigation measures in their construction schemes. The adverse effects of the project construction on the surrounding environment were thus minimized.

19. According to the monitoring results, the railway operation has not affected the habitat of protected species in nature reserves and the water quality of Yuse Reservoir is as described in the EIA. The noise level and environmental air meet the Government's regulatory standards, and there is no significant impact on the water quality of the receiving rivers. The Project has met its objective of environmental protection.

20. In recent years, the local governments in the area have constructed natural ecological

defense of Yangtze River and Zhujiang River upstream areas, and carried out a series of environmental protection projects, including water and soil protection projects in Beipan River and Nanpan River, terracing of slopes, and reforestation of farmland. Besides, by March 2001, all the small-scale coal mines in Guizhou Province that produced less than 30,000 tons of coal yearly had been closed. As a result, the quality of the environment in the project areas has gradually improved.

COMPLIANCE WITH MAJOR LOAN COVENANTS

Covenant		Reference to Loan Documents	Compliance Status
1	The Borrower shall furnish to the Asian Development Bank (ADB) all such reports and information as ADB shall reasonably request concerning (i) the Loan, and the expenditure of the proceeds and maintenance of the service thereof; (ii) the goods and services and other items of expenditure financed out of the proceeds of the Loan; (iii) the Project; (iv) the administration, operations and financial condition of the Guizhou Shuibai Railway Corporation (GSRC) and any other agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof; (v) financial and economic conditions in the territory of the Borrower and the international balance of payment position of the Borrower; and (vi) any other matters relating to the purposes of the Loan.	Loan Agreement (LA), Section 4.04	Complied with
2	The Borrower shall take all actions to enable the Province and GSRC to perform their respective obligations under the Project Agreement, including the establishment and maintenance of tariffs as stipulated in paragraph 13 of Schedule 6 and shall not take or permit any action which would interfere with the performance of such obligations.	LA, Section 4.06	Complied with
3	(i) GSRC shall be the Executing Agency of the Project; (ii) Project Management Office (PMO) shall be responsible for day-to-day Project implementation and commissioning of the Project railway. PMO shall be headed by a suitably qualified Project Manager who shall be assisted by an adequate number of suitably qualified professional staff; (iii) The Province shall set up a Lead Group for central coordination and resolution of any conflicts between the various agencies involved in Project implementation.	LA, Schedule 6, para. 1	Complied with
4	The Borrower, the Province and GSRC shall ensure that all necessary arrangements are made for the timely provision of sufficient local currency funds required for the timely implementation and completion of the Project, including cost overruns, if any.	LA, Schedule 6, para. 2	Complied with
5	The Borrower shall ensure that (i) local currency loans sourced from the State Development Bank (SDB) and the Province shall follow a repayment schedule (including a seven-year grace period for loan repayments) commensurate with GSRC's repayment capacity during the initial years of operation, and (ii) the Province, the Ministry of Railways (MOR) and the Ministry of Coal Industry (MCI) shall assist GSRC in sourcing working capital, if required, in the initial years of operation.	LA, Schedule 6, para. 2	Complied with

	Covenant	Reference to Loan Documents	Compliance Status
6	GSRC shall make the necessary applications for listing its shares on the stock exchange after it has achieved a satisfactory level of financial performance as prescribed by the Borrower.	LA, Schedule 6, para. 3	Not yet due
7	The Borrower, the Province and GSRC shall ensure that all land and right of way required for the Project are made available in a timely manner.	LA, Schedule 6, para. 4	Complied with
8	The Province and GSRC shall ensure that (i) the resettlement plan agreed with ADB is carried out promptly and efficiently, and that all persons affected by the acquisition of land required for the Project are compensated and (ii) resettled in accordance with the resettlement plan in a manner such that they shall be at least as well-off as they would have been in the absence of the Project. Affected persons shall be given assistance to restore incomes to at least pre-Project levels. (iii) Adequate funds shall be made available by GSRC in a timely manner for land acquisition and resettlement activities.	LA, Schedule 6, para. 5	Complied with
9	GSRC shall engage the Guizhou Social Sciences Academy (GSSA) to monitor the implementation of the resettlement plan and provide half yearly reports thereon during the implementation period, to provide a report upon completion of resettlement, and to evaluate the resettlement process one year after completion of resettlement. GSRC shall submit all of these reports immediately to ADB for review.	LA, Schedule 6, para. 6	Complied with
10	GSRC shall ensure that all applicable national, provincial, and local environmental laws, regulations, guidelines and standards are complied with during the Project construction and operational stages. GSRC shall ensure that adverse environmental impacts related to the construction and operation of the Project are minimized through implementation of the environmental monitoring program and mitigation measures as specified in the Environmental Impact Assessment (EIA) and Summary Environmental Impact Assessment (SEIA) prepared for the project, and as agreed with ADB.	LA, Schedule 6, para. 7	Complied with
11	GSRC shall engage the Guizhou Designing Institute of Environmental Sciences (GDIES) to perform the environmental monitoring activities. The results of the environmental monitoring and mitigation measures shall be reported to ADB by GSRC through the quarterly progress reports on Project implementation, through annual reports on environmental monitoring, and an evaluation report one year after completion of construction. The annual reports and the evaluation report shall be prepared by GDIES.	LA, Schedule 6, para 8.	Complied with

Covenant	Reference to Loan Documents	Compliance Status
12	GSRC shall provide adequate funds in a timely manner for implementation of environmental mitigation measures as are necessary.	LA, Schedule 6, para. 9
13	The Borrower shall ensure that the environmental mitigation measures proposed in the EIA and SEIA and as agreed with ADB shall be applied to the construction of service and link roads, as necessary.	LA, Schedule 6, para. 10
14	The Borrower shall ensure, or cause the Province to ensure, that (i) all Project-induced mining and industrial development shall undergo appropriate environmental assessment and review under the applicable national and provincial regulations to ensure minimal adverse environmental impacts and application of appropriate mitigation measures; (ii) the polluting small-scale mining and coking industries in the Project area shall be phased out and replaced by integrated modern plants, on the basis of the Borrower's guidelines of January 1997 on the modernization and control of polluting small-scale coking and mining operations; (iii) all necessary measures are taken to ensure workers' safety in coal mines in the Project area.	LA, Schedule 6, para. 11.
15	GSRC shall ensure that special precautions are taken to ensure the safety of construction workers during the construction of tunnels in special geological formations containing coal, gas, and ground water.	LA, Schedule 6, para. 12
16	(i) The Province shall set tariffs on the Project railway at full cost recovery including the operation and maintenance costs of the Chengdu Railway Administration Bureau (CRAB) and the management costs of GSRC, depreciation, debt-service in excess of depreciation, taxes, and a reasonable profit, taking into consideration market conditions. (ii) Tariffs to be charged at the beginning of commercial operations shall be based on a tariff study to be completed by GSRC before the start of commercial operations on the earliest completed sections of the Project railway. (iii) The tariff shall be reviewed annually and revised as necessary to achieve full cost recovery. (iv) Tariff adjustments shall be approved by the Province and implemented by GSRC within three months of completion of each such review.	LA, Schedule 6, para. 13
17	The Province shall ensure that the planned construction of service roads by GSRC and construction and upgrading of link roads by local governments to connect the Project railway with townships and villages in the Project hinterland shall be completed concurrently with the Project.	LA, Schedule 6, para. 14

Covenant		Reference to Loan Documents	Compliance Status
18	(i) The Borrower and the Province shall ensure that adequate funding is provided for the implementation of the planned development of coal production, industrial and natural resource projects in the Project area, which shall be completed by the Province as planned. (ii) The Province and MOR shall ensure the construction of interfaces between the coal mines and railway stations along the Project railway concurrently with the Project.	LA, Schedule 6, para. 15	Complied with
19	The Borrower shall ensure that MOR shall (i) construct the marshaling yard at Liupanshui, (ii) undertake capacity enhancements on the Loudi-Guiyang-Liupanshui (LGL) and Baiguo-Hongguo (BH) sections of the national railway, and (iii) construct the Neijiang to Liupanshui railway line concurrently with the Project.	LA, Scheedule 6, para. 16	Complied with
20	(i) GSRC shall enter into a concession agreement with CRAB entrusting the operation and maintenance of the railway to CRAB. GSRC shall ensure that the concession agreement, the terms and conditions of which are to be satisfactory to ADB, shall be based on market principles, and that the terms and conditions shall enable GSRC to fulfill its obligations under its Charter and the Loan while maintaining sustained financial viability. (ii) The project facilities shall be efficiently operated and maintained, with due regard to the safety of passengers and freight.	LA, Schedule 6, para. 17	Complied with
21	(i) The Province and GSRC shall ensure that electric power for the operation of the Project railway shall be provided as required. (ii) GSRC shall devise and implement appropriate public safety campaigns through media, public announcements, household contacts and schools to familiarize people living along the route of the Project with safety issues related to the electric railway.	LA, Schedule 6, para. 18	Complied with
22	(i) GSRC shall ensure that at least 45% of the Project's construction jobs shall be given to persons living below the poverty line. (ii) GSRC shall follow a pro-poor policy for engagement of workers for the remaining jobs, subject to the provision that the poor workers fulfill the job efficiency requirement. (iii) GSRC shall ensure that such workers are provided on-the-job training. The Province shall ensure that a pro-poor policy consistent with job capability and efficiency requirements is followed for the engagement of workers in the coal mines, and that training is provided to poor persons to enable them to take up available jobs.	LA, Schedule 6, para. 19	Complied with

Covenant		Reference to Loan Documents	Compliance Status
23	The Province shall increase the quality and extend the coverage of the public utilities, health, education, agriculture extension and credit in the Project area, to maximize the Project's impact on poverty reduction.	LA, Schedule 6, para. 20	Complied with
24	GSRC shall enter into a contract with GSSA for monitoring the Project's impact on poverty reduction and the impact of the Province's social programs. GSRC shall require GSSA to prepare annual monitoring reports and an evaluation report one year after the start of operations and shall submit these reports to ADB.	LA, Schedule 6, para. 21	Complied with
25	The Borrower, the Province, and GSRC shall ensure that the development plan for minority ethnic peoples in the Project area is implemented as agreed with ADB and in conformity with ADB's policy. GSRC shall enter into a contract with an independent institution acceptable to ADB for monitoring the implementation of the plan. GSRC shall require the independent institution to provide annual reports on the implementation and a final evaluation report one year after the completion of the Project, and shall submit these reports to ADB. GSRC shall ensure that women's representatives at prefecture, county and district levels take part in the implementation of the resettlement plan, and GSRC shall seek the advise of such representatives on the wider social and economic development of women in the Project area. The Borrower, the Province, and GSRC shall ensure that ADB's Policy on Gender and Development is followed during the implementation of the Project.	LA, Schedule 6, para. 22	Complied with
26	(i) GSRC shall monitor and evaluate the operations of the Project against selected operational parameters, as agreed with ADB, for five years, beginning from the first full year of commercial operation of the Project. (ii) GSRC shall monitor and evaluate the Project's benefits through periodic socioeconomic impact assessments to be undertaken by GSSA under agreed terms of reference acceptable to ADB. GSRC shall provide the results of these assessments to ADB.	LA, Schedule 6, para. 23	Not yet due
27	GSRC shall maintain records and accounts adequate to identify the goods and services and other items of expenditure financed out of the proceeds of the Loan, to disclose the use thereof in the Project, to record the progress of the Project (including the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, its operations and financial condition.	Project Agreement (PA), Section 2.06	Complied with

Covenant		Reference to Loan Documents	Compliance Status
28	GSRC shall furnish to ADB quarterly reports on the execution of the Project and on the operation and management of the Project facilities. Such reports shall be submitted within one month following the end of the quarter.	PA, Section 2.08 (b)	Complied with
29	Promptly after physical completion of the Project, but in any event not later than nine months thereafter, GSRC shall prepare and furnish to ADB a report, in such form and in such detail as ADB shall reasonably request, on the execution and initial operation of the Project.	PA, Section 2.08 (c)	Complied with
30	GSRC shall (i) maintain separate accounts for the Project and for its overall operations; (ii) have such accounts and related financial statements (balance sheet, statement of income and expenses, statement of sources and application of funds) audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; and (iii) furnish to ADB, not later than nine months after the close of the fiscal year to which they relate, 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.	PA, Section 2.9 (a)	Complied with
31	GSRC shall maintain its financial performance at levels which are sufficient to achieve (i) an operating ratio of not more than 70% for each of the fiscal years commencing from the fourth full fiscal year of full commercial operations, and (ii) a debt-service ratio of not less than 1.2 for each of the fiscal years commencing from the fourth full fiscal year of full commercial operations.	PA, Section 2.16 (a)	Not yet due

EFFECTS OF GSRC REORGANIZATION

1. **Purposes of GSRC Reorganization.** The executing agency (EA), the Guizhou Shuibai Railway Corporation (GSRC), acquired from the Ministry of Railways (MOR) the assets of the Hongguo-to-Baiguo railway line including 43 kilometers (km) of state-owned railway line between Hongguo and Baiguo and the connected facilities. GSRC issued equity shares to MOR for the agreed value of assets taken over. The assets had been transferred and the shares issued by the end of October 2004. This acquisition helped GSRC operate more economically. GSRC made the acquisition and subsequently reorganized to (i) extend the operational length of the railway line; (ii) expand GSRC's operating scope; (iii) increase its income and financial viability; (iv) build on the advantages of the shortest line route in southwest China; and (v) augment the transportation capacity of the Project.

2. **Status Before Reorganization.** The Project extended 118.0 km (operational length) between Luipanshui (Shuicheng) and Baiguo, and had a total investment (asset) of CNY3,247 million, which comprised CNY1,796 million in equity capital (CNY916 million from Guizhou provincial government [GPG] [51.0%] and CNY880 million from MOR [49.0%]) and CNY1,451 million in loans (CNY600 million from the State Development Bank [SDB] and \$105 million [about CNY851 million] from the Asian Development Bank [ADB]).

3. **Status after Reorganization.**

- (i) The Shuicheng-Baiguo-Hongguo railway line is 160.0 km long (operational length) and total assets of CNY3,598 million, as shown in Table A10.1.

Table A10.1: Assets of Guizhou Shuihong Railway Co., Ltd

Source of Funds	Amount (CNY million)	Percentage
Borrowing (CNY1,451 million) (40.33%)		
SDB	600	16.68
ADB	851 ¹	23.65
Capital (CNY2,147 million) (59.67%)		
MOR (57.3%)	1,231	34.21
GPG (42.7%)	916	25.46
Total	3,598	100.00

¹ \$105 million.

GPG = Guizhou Provincial Government, MOR = Ministry of Railways, SDB = State Development Bank.

Source: Guizhou Shuibai Railway Corporation.

- (ii) The majority owner of GSRC changed from the GPG to MOR.
- (iii) To reflect the extension of its railway line (Shuicheng-Baiguo-Hongguo), Guizhou Shuibai Railway Co., Ltd changed its name to the "Guizhou Shuihong Railway Co., Ltd (New GSRC)" on 8 December 2004.
- (iv) The creditor's rights and debts of the GSRC transferred to the New GSRC.
- (v) As resolved at a meeting of the new shareholders, the GSRC bylaws were revised, and its board of directors (BOD) and board of supervisors (BOS) were reelected. The new BOD includes seven representatives of two shareholders, and the new

BOS has five representatives. The membership of the new BOD and the new BOS is shown in Table A10.2.

Table A10.2: The New GSRC Board of Directors and Board of Supervisors

BOD			BOS		
Name	Position	Entity Represented	Name	Position	Entity Represented
Qiu Zhipeng	Chairman	MOR	Song Rongfa	Chairman	GPG
Li Baofang	Vice-chairman	GPG	Fu Yunsong	Member	MOR
Su Shunhu	Member	MOR	Luo Fawu	Member	MOR
Li Hongwei	Member	MOR	Qian Lingshan	Member	GPG
Yuan Minghao	Member	MOR	Liu Wensheng	Member	GSRC
Chen Yong	Member	GPG			
Wang Yongmao	Member	GPG			

GPG = Guizhou Provincial Government, GSRC = Guizhou Shuibai Railway Corporation, MOR = Ministry of Railways.

Source: Guizhou Shuibai Railway Corporation.

(v) The organization chart of the New GSRC is given in Table A10.3.

4. Effects of the Reorganization.

(i) **Debt-equity ratio.** The debt-to-capital ratio decreased from 44.7% to 40.3% after the reorganization. The lower debt-equity ratio puts the loan providers in a more secure position.

Table A10.3: Capital Structure of Guizhou Shuibai Railway Corporation

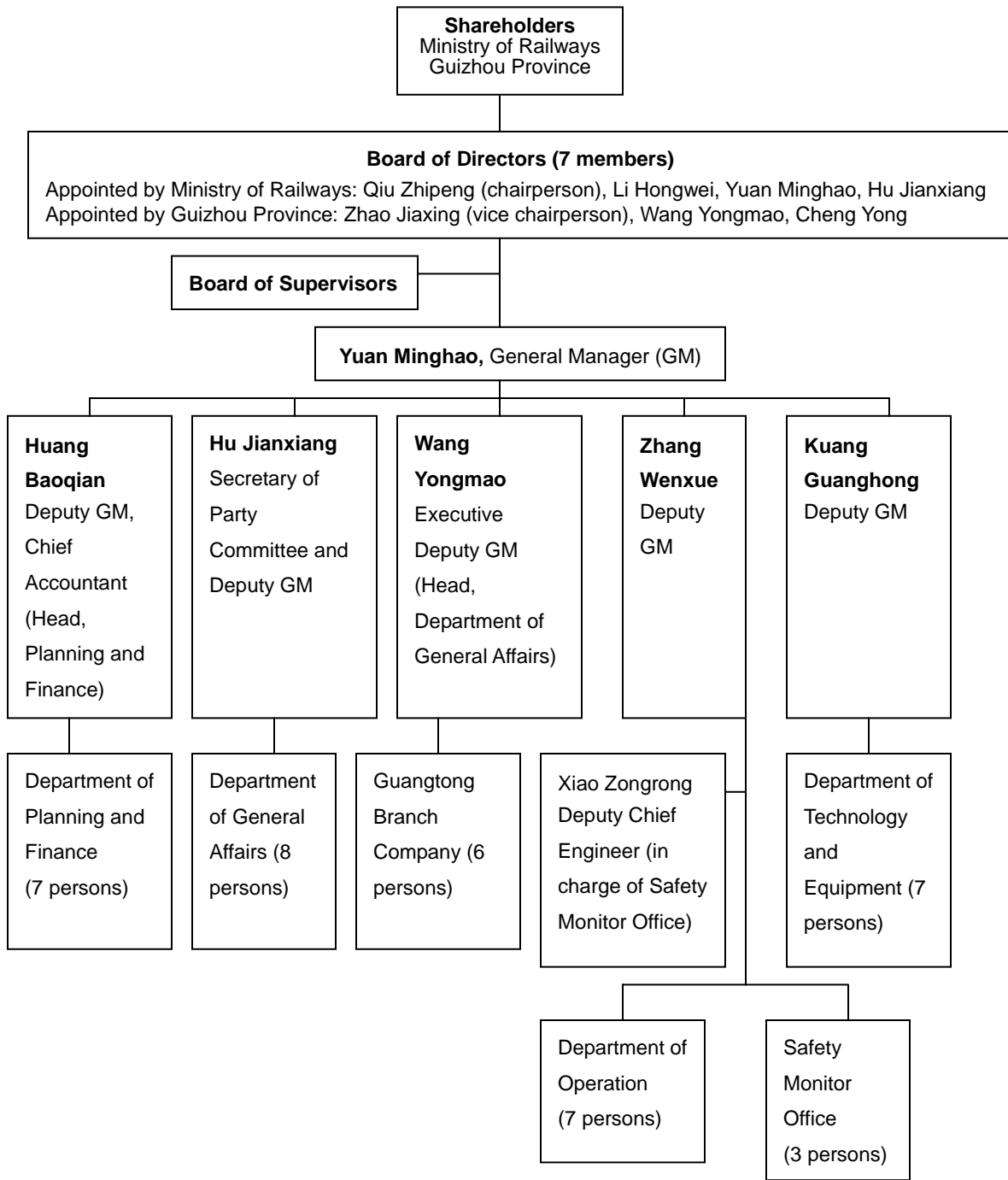
Item	Before		After	
	Amount (CNY million)	%	Amount (CNY million)	%
Equity	1,796.00	55.3	2,147.00	59.7
Loan	1,451.03	44.7	1,451.03	40.3
Total investment	3,247.03	100.0	3,598.03	100.0

Source: Guizhou Shuibai Railway Corporation.

- (ii) **Financial leverage.** The lower financial leverage decreased the shareholders' return on equity (ROE), but the improved revenue base reduced their financial risk. The larger asset base also increased capacity for debt repayment and interest payment.
- (iii) **Liquidity.** Higher revenues increased the liquidity of the Project, an especially important factor in the first years of operation. The Project can enjoy a larger cash pool from operations without an extra investment in cash.
- (iv) **Profitability.** The reorganization brought in more revenue. According to GSRC's annual report for 2004, freight loading and delivery increased by 133.1% and 131.1% in the 2 months after the reorganization.
- (v) **Economic analysis.** Since the Hong-Bai section already exists, the merger was not expected to affect the economic analysis using "with Project" and "without Project" scenarios.

- (vi) **Transportation of goods.** In the 10 months from 1 January to 31 October 2004, 7,470 wagons were loaded (459,971 tons of coal and coke), 1,507 trains were dispatched, and 30,155 wagons were moved as transit traffic, for a total transport revenue of about CNY57.009 million. After the reorganization, in November and December alone, 21,380 wagons were loaded (1,305,067 ton of coal and coke), 252 trains were dispatched, and 8,221 wagons were moved as transit traffic, for a total transport revenue of about CNY29.633 million. These figures show that operations in November and December were much better than in the previous 10 months: the number of loaded wagons increased monthly by 133.1%, dispatched goods by 131.9%, and transport revenue by 159.9%.
- (vii) **Passenger transportation:** The New GSRC entered into an agreement with the Kunming Railway Administration Bureau (KRAB) in mid-December 2004 to operate passenger transport trains along the project railway line. KRAB started passenger transport operation on 1 February 2005. Two pairs of passenger trains now run daily:
- (a) Train No. 6061/2: Kunming-Baiguo-Liupanshui (slow train); and
 - (b) Train No. 6081/2/3/4: Kunming-Weishe (Nankun railway line)-Baiguo-Liupanshui-Guiyang (slow train from Kunming to Baiguo, express train from Baiguo to Guiyang).

Figure A10: Organization Chart of Guizhou Shuihong Railway Co., Ltd



GM = General Manager.

Source: Guizhou Shuibai Railway Corporation.

COAL PRODUCTION IN THE PROJECT AREA

('000 tons)

Name of the Mine	1997 ^d	1998 ^d	1999 ^d	2000 ^d	2001 ^d	2002 ^d	2003 ^d	2004 ^d	2006 ^e	2011 ^e	2016 ^e	2020 ^e	2022 ^e
A. Local Mines													
Shuicheng County	1,287	1,746	855	703	640	384	1,228	2,344	7,800	11,700	17,590	26,390	26,390
Panxian County	4,628	6,070	2,907	2,400	2,194	1,642	2,452	4,402	12,300	18,500	27,860	41,790	41,790
Zhongshan District	1,365	1,587	877	698	612	662	697	1,429	6,200	10,050	16,200	26,390	26,390
Subtotal (A)	7,280	9,404	4,639	3,801	3,446	2,689	4,377	8,174	26,300	40,250	61,650	94,570	94,570
B. State Mines													
	1,000	1,000	1,000	1,000	1,000	3,200	6,700	9,800	12,400	19,840	30,100	45,000	49,200
Subtotal (B)	1,000	1,000	1,000	1,000	1,000	3,200	6,700	9,800	12,400	19,840	30,100	45,000	49,200
Total (A+B)	8,280	10,404	5,639	4,801	4,446	5,889	11,077	17,974	38,700	60,090	91,750	139,570	143,770
Appraisal Estimate	6,318			11,850			17,650		27,110	30,180	30,450		30,650

^a actual

^e estimated

Note: There were 561 small mines in year 2000 and 481 small mines in year 2004, 80 (561-481) small mines are closed.

Source: Guizhou Shuibai Railway Corporation and Provincial Government.

PROJECTED FREIGHT AND PASSENGER TRAFFIC

Traffic	2003		2004		2005		2006		2010		2012		2016		2022	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Projected	Appraisal	Projected	Appraisal	Projected	Appraisal	Projected	Appraisal	Projected	Appraisal	Projected
Freight ('000 ton)																
Transit	1,971	1,245	2,879	2,000	3,787	3,066	4,695	3,679	5,522	6,093	6,089	6,093	7,529	6,093	8,344	6,093
Local	4,165	505	6,424	1,840	8,684	5,671	10,943	6,430	14,520	8,705	16,041	10,647	18,547	10,647	21,886	10,647
Total	6,136	1,750	9,303	3,840	12,471	8,737	15,638	10,109	20,042	14,798	22,130	16,740	26,076	16,740	30,230	16,740
Average Hauling Distance (km)	86	108	86	92	87	100	87	111	86	118	86	114	87	114	87	114
Total Ton-km (million)	528	189	800	353	1,085	874	1,361	1,122	1,724	1,746	1,903	1,908	2,269	1,908	2,630	1,908
Passengers																
Transit	360	0	540	0	720	563	900	1,000	1,380	1,800	1,545	2,000	1,725	2,000	1,898	2,000
Local	60	0	80	0	100	1,137	120	2,000	160	3,200	175	3,500	196	3,500	216	3,500
Total	420	0	620	0	820	1,700	1,020	3,000	1,540	5,000	1,720	5,500	1,921	5,500	2,114	5,500
Average Journey Distance (km)	112	0	113	100	113	100	114	100	115	102	115	102	115	102	115	102
Total Passenger-km (million)	47	0	70	0	93	170	116	300	177	510	198	561	221	561	243	561

Source: Guizhou Shuibai Railway Corporation.

PERFORMANCE INDICATORS AND FINANCIAL PERFORMANCE

1. The financial statements of the Guizhou Shuibai Railway Corporation (GSRC) comprise the actual figures for 1998 to 2004, and projections for 2005 onward, based on information provided by the company. The financial statements (Tables A13.1, A13.2, and A13.3) are based on the traffic forecast revised by GSRC. The main assumptions, to the extent that they differ from those at appraisal, are as follows:

- (i) The principal of the Asian Development Bank (ADB) loan has been reduced from \$140 million to \$105 million.
- (ii) The repayment of principal for both ADB and State Development Bank (SDB) debt has been rescheduled. The ADB loan started to be repaid in 2004 instead of 2003, and the SDB loan in 2004 instead of 2005.
- (iii) Interest rates remain constant at the 2004 level, i.e., 6.31% per year for ADB and 5.76% for SDB.
- (iv) The tariff remains at CNY0.28 per ton-kilometer for local freight traffic and CNY0.12 for transit freight traffic throughout 2005–2022.
- (v) Traffic will reach capacity in 2012 and remain constant thereafter.
- (vi) Passenger transport operations did not start until 2005. It has been outsourced to the Kunming Railway Administration Bureau (KRAB) for the lump sum of CNY5.99 million per pair of passenger trains. As forecast by GSRC, two pairs of passenger trains will operate in 2005 and four pairs will operate from 2006 onward.
- (vii) The pre-tax profits will not be shared with anyone, as provided at appraisal in a concession agreement with the Chengdu Railway Administration Bureau.
- (viii) Transport operation and maintenance has been outsourced to KRAB according to the traffic volume.

Table A13.1: Income Statement
(CNY million)

Year Ending 31 December	2003		2004		2005		2006		2007		2008		2009		2010	
	Appraisal	actual	Appraisal	actual	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised
Operating Revenue	224.1	12.5	355.9	80.9	497.9	200.1	650.1	273.9	723.6	317.3	771.0	355.4	820.0	394.2	866.3	399.9
Freight	206.9	12.95	328.7	73.1	460.0	166.4	600.6	220.1	667.9	261.0	710.6	296.1	755.1	331.5	797.2	333.0
Passenger ^a	4.0	0.0	6.2	0.0	8.5	12.0	11.2	24.0	13.1	24.0	15.2	24.0	16.8	24.0	18.4	24.0
Other	20.7	0.0	32.9	10.5	46.0	28.4	60.1	39.0	66.8	42.9	71.1	47.2	75.5	51.9	79.7	56.4
Business Tax	7.5	0.4	11.9	2.7	16.7	6.7	21.8	9.2	24.2	10.6	25.8	11.9	27.5	13.2	29.0	13.4
Working Costs:	101.8	47.0	131.7	83.2	164.9	109.8	200.2	125.0	218.1	148.3	236.1	161.6	255.3	174.7	275.8	177.9
GSRC Management Cost ^c	1.8	5.8	2.0	5.8	2.2	7.3	2.4	7.8	2.7	8.3	3.0	8.8	3.2	9.4	3.6	9.9
Operating Cost ^b	100.0	41.2	129.7	77.4	162.7	102.5	197.8	117.2	215.4	140.0	233.1	152.8	252.1	165.4	272.2	168.0
- Salary and Wages	17.0	3.4	20.8	3.4	26.2	4.8	31.4	5.1	33.5	5.6	34.8	6.0	36.2	6.5	37.7	7.0
- Fuel and Electricity	20.1	3.1	29.0	17.5	38.6	20.9	49.0	24.0	54.1	36.4	59.6	38.9	65.5	41.3	71.7	41.4
-Materials/outsourcing transport cost	15.4	3.8	18.8	21.6	22.3	35.0	26.2	44.9	28.3	53.4	30.5	61.7	32.9	69.6	35.4	69.8
-Leasing Charges	18.8	0.5	29.9	2.9	41.7	6.4	54.5	6.7	60.8	7.0	67.4	7.4	74.5	7.7	82.1	8.1
-Administration Cost/loading costs	2.5	0.4	3.9	2.1	5.5	6.6	7.2	7.2	8.0	7.9	8.9	8.7	9.8	9.6	10.8	10.6
-Maintenance & Repair	26.2	30.0	27.3	30.0	28.4	28.9	29.5	29.3	30.7	29.7	31.9	30.1	33.2	30.6	34.5	31.1
Depreciation ^d	64.8	0.4	131.3	60.5	131.3	76.8	131.3	76.8	144.6	76.8	157.9	76.8	157.9	76.8	158.9	76.8
Operating Cost	166.6	47.4	263.0	143.7	296.2	186.6	331.5	201.8	362.7	225.1	394.0	238.5	413.2	251.6	434.7	254.8
Operating Profit	57.5	-34.9	92.9	-62.9	201.7	13.5	318.6	72.1	360.9	92.2	377.0	116.9	406.8	142.6	431.6	145.2
Nonsoperating Cost	3.1	1.4	4.0	1.6	4.9		6.0		6.5		7.1		7.7		8.3	
Interest Expense	83.8		167.9	89.5	166.8	87.1	160.7	83.4	148.7	78.5	138.1	72.5	126.5	66.4	114.2	60.2
Profit Sharing with CRAB							6.3		10.2		9.2		38.7		45.8	
Profit Before Tax	(29.32)	(36.30)	(78.93)	(153.97)	29.94	(73.63)	145.58	(11.32)	195.4	13.7	222.7	44.5	233.9	76.2	263.4	85.0
Income tax							22.20		64.5		73.5		77.2	0.0	86.9	25.1
Profit After Tax	(29.32)	(36.30)	(78.93)	(153.97)	29.94	(73.63)	123.38	(11.32)	130.9	13.7	149.2	44.5	156.7	76.2	176.5	59.8
Performance Indicators																
Feight ton-km (million)	525.2	189.0	801.8	354.2	1,079.8	874.5	1,355.8	1,123	1,448.8	1,335.9	1,541.4	1,542.0	1,634.5	1,740.9	1,725.6	1,746.2
Passenger-km (million)	47.0	0.0	69.9	0.0	92.9	170.0	116.3	300.0	131.3	351.4	146.4	403.2	161.6	455.4	176.8	508.0
Freight Tariff (Y/ton-km)	0.394	0.300	0.410	0.300	0.426	0.312	0.443	0.324	0.461	0.337	0.461	0.351	0.462	0.365	0.462	0.380
Passenger Tariff (Y/pax-km)	0.085		0.089		0.092	0.092	0.096		0.100	0.100	0.104	0.104	0.104	0.104	0.104	0.104
Number of Staff (CRAB)	720	42	844	42	1026	42	1181	42	1210	42	1210	42	1210	42	1210	42
Converted ton-km/Staff	795	4,500	1,033	8,433	1,143	24,867	1,246	33,870	1,306	40,175	1,395	46,315	1,484	52,292	1,572	53,672
Working Ratio (percent)	45.4%	375.3%	37.0%	102.9%	33.1%	54.9%	30.8%	45.6%	30.1%	46.7%	30.6%	45.5%	31.1%	44.3%	31.8%	44.5%
Operating Ratio (percent)	74.3%	378.6%	73.9%	177.7%	59.5%	93.3%	51.0%	73.7%	50.1%	71.0%	51.1%	67.1%	50.4%	63.8%	50.2%	63.7%

^a based on contract with Kunming Railway Administration Bureau from 2005 on

^b different breakdown due to GRSC data available for revised operating cost as shown after /

^c excluding intangible asset amortization provision

^d including intangible asset amortization provision

Source: Guizhou Shuibai Railway Corporation and consultant estimate.

Table A13.2: Balance Sheet
(CNY million)

Year Ending 31 December	1998		1999		2000		2001		2002		2003		2004	
	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual
Current Assets:	0.0	420.0	0.0	648.4	(0.0)	642.7	0.1	562.2	0.1	640.5	23.0	363.2	34.6	118.4
Cash		329.0	0.0	425.4	(0.0)	523.8	0.1	313.8	0.1	485.5	5.7	315.8	7.2	89.8
Accounts Receivable		91.0		223.0		118.8		248.4		155.0	17.2	47.5	27.4	28.6
Fixed Assets	140.4	746.0	577.0	964.3	1,493.1	1,755.7	2,384.0	2,379.8	3,048.6	2,732.9	3,261.5	3,133.6	3,130.2	3,426.6
Gross Assets in Operation		1.7		2.4		2.9		3.5		5.6	3,326.3	10.4	3,326.3	3,646.2
Accumulated Depreciation		0.3		0.5		0.6		1.0		1.3	64.8	2.0	196.1	222.9
Net Assets in Service	0.0	1.4	0.0	1.9	0.0	2.3	0.0	2.5	0.0	4.3	3,261.5	8.4	3,130.2	3,423.3
Work in Progress	140.4	744.7	577.0	962.4	1,493.1	1,753.4	2,384.0	2,377.3	3,048.6	2,728.6		3,125.2		3.3
Total Assets	140.4	1,166.0	577.0	1,612.7	1,493.1	2,398.4	2,384.1	2,942.1	3,048.7	3,373.4	3,284.5	3,496.8	3,164.8	3,545.0
Accounts Payable		461.0		166.1		131.3		130.6		140.9	8.5	235.5	11.0	93.2
Long-term Debts:	0.0	160.0	64.9	660.8	507.0	930.4	1,403.2	1,349.9	2,081.2	1,435.3	2,355.9	1,464.5	2,335.3	1,456.7
- Bank		0.0	49.3	200.8	288.9	380.4	748.8	749.9	1,166.4	835.3	1,254.6	864.5	1,243.8	856.7
- SDB		160.0		460.0		550.0	152.3	600.0	409.0	600.0	600.0	600.0	600.0	600.0
- MOR and GPG			15.6		218.1		502.1		505.8		501.3		491.5	
Capital	140.5	545.0	512.1	755.0	987.0	1,335.0	987.0	1,461.0	1,264.0	1,796.0	987.0	1,796.0	987.0	2,147.0
- MOR	50.5	455.0	184.2	455.0	355.0	755.0	355.0	755.0	632.0	880.0	355.0	880.0	355.0	1,231.0
- MCI	28.5		103.8		200.0		200.0		200.0		200.0		200.0	
- GPG	61.5	90.0	224.1	300.0	432.0	580.0	432.0	706.0	432.0	916.0	432.0	916.0	432.0	916.0
Retained earnings											(29.3)		(108.3)	(154.0)
Adjustments for:														
- Foreign Exchange Reserves				30.9	(0.9)	1.7	(6.1)	0.7	(19.6)	1.3	(37.6)	0.8	(60.2)	2.1
- Asset Revaluation Reserves														
Total Liabilities and Capital	140.5	1,166.0	577.0	1,612.7	1,493.1	2,398.4	2,384.1	2,942.1	3,325.6	3,373.4	3,284.5	3,496.8	3,164.8	3,545.0

Source: Guizhou Shuibai Railway Corporation Financial Statements 1998 - 2004, and Guizhou Shuibai Railway Corporation and consultant estimate.

Table A13.2: Balance Sheet
(CNY million)

Year Ending 31 December	2005		2006		2007		2008		2009		2010	
	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised
Current Assets:	100.7	(18.8)	204.6	(30.0)	338.3	(37.3)	493.9	(16.8)	647.9	33.2	796.4	143.5
Cash	62.4	(32.6)	154.6	(48.3)	282.6	(59.1)	434.6	(41.4)	585.0	5.6	729.9	115.7
Accounts Receivable	38.3	13.9	50.1	18.3	55.7	21.8	59.2	24.7	62.9	27.6	66.4	27.7
Fixed Assets	2,998.9	3,349.8	2,867.6	3,272.9	3,388.3	3,926.1	3,230.4	3,849.2	3,072.4	3,772.4	2,963.4	3,722.3
Gross Assets in Operation	3,326.3	3,649.5	3,326.3	3,649.5	3,991.6	4,379.5	3,991.6	4,379.5	3,991.6	4,379.5	4,041.5	4,406.2
Accumulated Depreciation	327.4	299.7	458.7	376.6	603.3	453.4	761.2	530.2	919.2	607.1	1,078.1	683.9
Net Assets in Service	2,998.9	3,349.8	2,867.6	3,272.9	3,388.3	3,926.1	3,230.4	3,849.2	3,072.4	3,772.4	2,963.4	3,722.3
Work in Progress												
Total Assets	3,099.6	3,331.0	3,072.2	3,243.0	3,726.6	3,888.8	3,724.3	3,832.5	3,720.3	3,805.6	3,759.8	3,865.8
Accounts Payable	13.7	9.1	16.7	10.4	18.2	12.4	19.7	13.5	21.3	14.6	23.0	14.8
Long-term Debts:	2,260.0	1,380.4	2,128.3	1,302.4	2,006.6	1,202.6	1,875.0	1,100.8	1,733.8	996.7	1,592.3	890.1
- Bank	1,229.9	840.4	1,212.6	822.4	1,191.5	802.6	1,166.4	780.8	1,136.7	756.7	1,102.0	730.1
- SDB	556.8	540.0	461.3	480.0	380.3	400.0	294.1	320.0	203.6	240.0	118.6	160.0
- MOR and GPG	473.3		454.4		434.8		414.5		393.5		371.7	
Capital	987.0	2,147.0	987.0	2,147.0	987.0	2,147.0	987.0	2,147.0	987.0	2,147.0	987.0	2,147.0
- MOR	355.0	1,231.0	355.0	1,231.0	355.0	1,231.0	355.0	1,231.0	355.0	1,231.0	355.0	1,231.0
- MCI	200.0		200.0		200.0		200.0		200.0		200.0	
- GPG	432.0	916.0	432.0	916.0	432.0	916.0	432.0	916.0	432.0	916.0	432.0	916.0
Retained earnings	(78.3)	(227.6)	45.1	(238.9)	176.0	(225.2)	325.2	(180.8)	481.9	(104.6)	658.4	(44.7)
Adjustments for:												
- Foreign Exchange Reserves	(82.8)	22.0	(104.9)	22.1	(126.1)	22.1	(147.6)	22.1	(168.6)	22.0	(189.0)	128.7
- Asset Revaluation Reserves					664.9	729.9	665.0	729.9	664.9	729.9	664.9	729.9
Total Liabilities and Capital	3,099.6	3,331.0	3,072.2	3,243.0	3,726.6	3,888.8	3,724.3	3,832.5	3,720.3	3,805.6	3,736.6	3,865.8

Source: Guizhou Shuibai Railway Corporation Financial Statements 1998 - 2004, and Guizhou Shuibai Railway Corporation and consultant estimate.

Table A13.3: Cash Flow Statement
(CNY million)

Year Ending 31 December	1998		1999		2000		2001		2002		2003		2004	
	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual	Appraisal	actual
Source of Funds														
Funds from Operation											122.3	(34.48)	224.2	(2.38)
Operating Profit											57.5	(34.89)	92.9	(62.86)
Depreciation											64.8	0.4	131.3	60.5
Short-term debt		370.7		24.9		13.1		22.4		2.9				
Long-term Debts	0.0	160.0	64.9	500.8	441.1	269.6	891.0	419.5	664.6	85.4	277.4	0.0	0.0	0.0
- Bank			49.3	200.8	238.7	179.6	454.7	369.5	404.1	85.4	86.4			
- SDB		160.0		300.0		90.0	152.3	50.0	256.7		191.0			
- MOR			15.6		202.4		284.0		3.8					
- Guizhou Province														
Capital Contribution	140.4	545.0	371.6	210.0	475.0	580.0	0.0	126.0	0.0	335.0				
- MOR	50.5	455.0	133.7	0.0	170.8	300.0		0.0		125.0				
- MCI	28.5		75.3		96.2									
- GPG	61.5	90.0	162.6	210.0	207.9	280.0		126.0		210.0				
Total Sources	140.4	1,075.7	436.5	735.7	916.1	862.7	891.0	567.9	664.6	423.3	399.7	(34.5)	224.2	(2.4)
Application of Funds														
Capital Expenditures	140.4	746.7	436.5	215.7	916.1	815.3	890.9	603.2	664.6	349.7	277.7	409.0		
Debt Service	0.0	0.0	0.0	11.5	0.0	52.3	0.0	69.8	0.0	251.6	104.6	0.0	211.1	124.3
Interest Payment											83.9	0.0	167.9	89.5
- Bank											43.1		86.7	54.8
- SDB											31.6	0.0	63.2	34.7
- MOR											5.0		9.7	
- GPG											4.2		8.3	
Principal Repayment											20.7	0.0	43.2	34.8
- Bank											15.9	0.0	33.4	14.8
- SDB												0.0		20.0
- MOR											4.8		9.8	
- GPG														
- Short-term Debts				11.5		52.3		69.8		251.6				
Nonoperating Cost						0.4					3.1	1.4	4.0	1.6
Change in Working Capital				412.0		(103.8)		104.9		(349.7)	8.8	(275.2)	7.7	97.7
Profit Sharing with CRAB											0.0	0.0	0.0	0.0
Income Tax											0.0	0.0	0.0	0.0
Total Application	140.4	746.7	436.5	639.2	916.1	764.2	890.9	777.9	664.6	251.6	394.1	135.3	222.7	223.6
Net Cash Position	0.0	329.0	0.0	96.5	(0.0)	98.4	0.1	(210.0)	0.0	171.7	5.6	(169.8)	1.5	(226.0)
Cash at the Beginning			0.0	329.0	0.0	425.4	(0.0)	523.8	0.1	313.8	0.1	485.5	5.7	315.8
Cash at the End	0.0	329.0	0.0	425.4	(0.0)	523.8	0.1	313.8	0.1	485.5	5.7	315.8	7.2	89.8
Debt-service Ratio											1.2	-	1.1	(0.0)

Source: Guizhou Shuibai Railway Corporation's Final Accounts at Completion, and Guizhou Shuibai Railway Corporation and consultant estimate.

Table A13.3: Cash Flow Statement
(CNY million)

Year Ending 31 December	2005		2006		2007		2008		2009		2010	
	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised
Source of Funds												
Funds from Operation	333.0	90.3	449.9	148.9	505.5	169.0	534.9	193.8	564.7	219.4	590.5	222.0
Operating Profit	201.7	13.5	318.6	72.1	360.9	92.2	377.0	116.9	406.8	142.6	431.6	145.2
Depreciation	131.3	76.8	131.3	76.8	144.6	76.8	157.9	76.8	157.9	76.8	158.9	76.8
Short-term debt												
Long-term Debts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Bank												
- SDB												
- MOR												
- Guizhou Province												
Capital Contribution												
- MOR												
- MCI												
- GPG												
Total Sources	333.0	90.3	449.9	148.9	505.5	169.0	534.9	193.8	564.7	219.4	590.5	222.0
Application of Funds												
Capital Expenditures											26.7	26.7
Debt Service	264.7	143.4	314.4	161.4	292.1	178.3	291.1	174.3	288.7	170.5	276.1	60.2
Interest Payment	166.9	87.1	160.6	83.4	148.7	78.5	138.0	72.5	126.5	66.4	114.2	60.2
- Bank	86.0	53.8	85.0	52.8	83.8	51.6	82.4	50.3	80.6	48.9	78.6	47.3
- SDB	63.2	33.3	58.6	30.7	48.6	26.9	40.0	22.2	31.0	17.5	21.4	12.8
- MOR	9.4		9.0		8.6		8.2		7.8		7.4	
- GPG	8.3		8.0		7.7		7.4		7.1		6.8	
Principal Repayment	97.8	56.3	153.8	78.0	143.4	99.8	153.1	101.9	162.2	104.1	161.9	
- Bank	36.3	16.3	39.4	18.0	42.9	19.8	46.6	21.9	50.7	24.1	55.1	26.6
- SDB	43.2	40.0	95.5	60.0	80.9	80.0	86.2	80.0	90.5	80.0	85.0	80.0
- MOR	10.2		10.5		10.9		11.3		11.7		12.1	
- GPG	8.1		8.4		8.7		9.0		9.3		9.7	
- Short-term Debts												
Nonoperating Cost	4.9	0.0	6.0	0.0	6.5	0.0	7.1	0.0	7.7	0.0	8.3	0.0
Change in Working Capital	8.2	69.3	8.8	3.2	4.1	1.5	2.1	1.8	2.1	1.9	1.8	(0.1)
Profit Sharing with CRAB	0.0	0.0	6.3	0.0	10.2	0.0	9.2	0.0	38.7	0.0	45.8	0.0
Income Tax	0.0	0.0	22.2	0.0	64.5	0.0	73.5	0.0	77.2	0.0	86.9	25.1
Total Application	277.8	212.7	357.7	164.6	377.4	179.7	382.9	176.2	414.4	172.4	445.6	111.9
Net Cash Position	55.2	(122.4)	92.2	(15.7)	128.0	(10.7)	152.0	17.6	150.3	47.1	145.0	110.1
Cash at the Beginning	7.2	89.8	62.4	(32.6)	154.6	(48.3)	282.6	(59.1)	434.6	(41.4)	585.0	5.6
Cash at the End	62.4	(32.6)	154.6	(48.3)	282.6	(59.1)	434.6	(41.4)	585.0	5.6	729.9	115.7
Debt-service Ratio	1.3	0.6	1.4	0.9	1.73	0.9	1.8	1.1	2.0	1.3	2.1	3.7

Source: Guizhou Shuibai Railway Corporation's Final Accounts at Completion, and Guizhou Shuibai Railway Corporation and consultant estimate.

Table A13.4: Performance Indicators

Year Ending 31 December	2003		2004		2005		2006		2007		2008		2009		2010	
	Appraisal	actual	Appraisal	actual	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised	Appraisal	revised
Traffic																
Feight ton-km (million)	525	189	802	354	1,080	874	1,356	1,123	1,449	1,336	1,541	1,542	1,635	1,741	1,726	1,746
Passenger-km (million)	47	0	70	0	93	170	116	300	131	351	146	403	162	455	177	508
Converted ton-km	572	189	872	354	1,173	1,044	1,472	1,423	1,580	1,687	1,688	1,945	1,796	2,196	1,902	2,254
Freight tons (million)	6,136	1,750	9,303	3,840	12,471	8,737	15,638	10,109	16,739	11,513	17,840	13,106	18,941	14,716	20,042	14,798
Passengers (million)	420	0	620	0	820	1,700	1,020	3,000	1,150	3,500	1,280	4,000	1,410	4,500	1,540	5,000
Average Freight Distance (km)	86	108	86	92	87	100	87	111	87	116	86	118	86	118	86	118
Average Passenger Journey (km)	112	0	113	100	113	100	114	100	114	100	114	101	115	101	115	102
Ton-km per Route Km (million)	4.5	1.6	6.9	3.0	9.2	5.5	11.6	7.0	12.4	8.3	13.2	9.6	14.0	10.9	14.7	10.9
Passenger-Km per Route Km (million)	0.4	0.0	0.6	0.0	0.8	1.1	1.0	1.9	1.1	2.2	1.3	2.5	1.4	2.8	1.5	3.2
Staff																
Employees (no.)	720	42	844	42	1026	42	1181	42	1210	42	1210	42	1210	42	1210	42
Converted ton-km/Employee (million)	0.79	4.50	1.03	8.43	1.14	24.87	1.25	33.87	1.31	40.17	1.39	46.32	1.48	52.29	1.57	53.67
Financial																
Operating Ratio (%)	74.3%	378.6%	73.9%	177.7%	59.5%	93.3%	51.0%	73.7%	50.1%	71.0%	51.1%	67.1%	50.4%	63.8%	50.2%	63.7%
Annual Rate Return on Fixed Assets (%)	1.8%	-416.1%	3.0%	-1.8%	6.7%	0.4%	11.1%	2.2%	10.7%	2.3%	11.7%	3.0%	13.2%	3.8%	14.6%	3.9%
Debt Service Ratio	1.2	-	1.1	0.0	1.3	0.6	1.4	0.9	1.7	0.9	1.8	1.1	2.0	1.3	2.1	3.7

Source: Guizhou Shuibai Railway Corporation and Consultant estimate.

FINANCIAL REEVALUATION

1. The financial internal rate of return (FIRR) was reevaluated using the same methodology as at appraisal (Table A14). The FIRR is based on the traffic forecasts prepared by the project completion review mission in consultation with the Guizhou Shuibai Railway Corporation (GSRC). The major assumptions were the following:

- (i) The components of the FIRR calculations were in constant 1998 prices and covered the period from 1998 to 2022.
- (ii) Capital costs were based on the actual project costs but excluded interest and other charges during construction.
- (iii) Revenues, where passenger revenues were outsourced contract amounts, were expressed net of the business tax of 3.24% on the gross operating revenue.
- (iv) Current freight tariffs (CNY0.28 per ton-kilometer [ton-km] for originating and terminating freight traffic and CNY0.12 per ton-km for transit freight traffic) were assumed to remain constant in real terms over the project period.
- (v) The operating costs included only incremental costs incurred in operation and excluded provisions for depreciation. The operating costs were revised by GSRC to include its transportation operation and maintenance contract with the Kunming Railway Administration Bureau.
- (vi) The residual value was estimated on the basis of an average economic life of assets of 55 years.

Table A14: Financial Internal Rate of Return
(CNY million)

Year	Capital Cost ^a	Income Tax Paid	Operating Costs	Revenue	Net Cash Flow
1998	746.7	0.0			(746.7)
1999	215.7	0.0			(215.7)
2000	815.3	0.0			(815.3)
2001	603.2	0.0			(603.2)
2002	349.7	0.0			(349.7)
2003	409.0	0.0	48.4	12.5	(444.9)
2004		0.0	84.8	80.9	(4.0)
2005		0.0	109.8	200.1	90.3
2006		0.0	125.0	273.9	148.9
2007		0.0	148.3	317.3	169.0
2008		0.0	161.6	355.4	193.8
2009		0.0	174.7	394.2	219.4
2010	26.7	25.1	177.9	399.9	170.2
2011		36.5	185.2	426.4	204.7
2012		45.7	193.2	455.7	216.8
2013		47.5	193.2	455.7	215.0
2014		48.3	193.2	455.7	214.2
2015		49.1	193.2	455.7	213.4
2016		50.1	193.2	455.7	212.5
2017		51.1	193.2	455.7	211.4
2018		52.2	193.2	455.7	210.3
2019		53.4	193.2	455.7	209.1
2020		60.5	193.2	455.7	202.0
2021		60.7	193.2	455.7	201.8
2022	(2,800.3)	60.9	193.2	455.7	3,002.0
				FIRR =	4.19%

FIRR = financial internal rate of return.

^a 1998–2004 data from Guizhou Shuibai Railway Corporation Financial Statements.

Sensitivity Analysis

Scenario	FIRR
Base Case	4.19%
Operating Costs increase by 10%	3.74%
Revenue decrease by 10%	3.24%

FIRR = financial internal rate of return.

Source: Consultant estimate.

ECONOMIC REEVALUATION

1. The economic internal rate of return (EIRR) was reevaluated on the basis of “with-Project” and “without-Project” assumptions (Table A15). Benefits from service roads transferred to the villages, which were not included in the evaluation at appraisal, were included this time. The major features of the reevaluation were as follows:

- (i) All the components were expressed in 1998 constant prices.
- (ii) The computation of economic capital costs was based on actual project costs.
- (iii) Local cost components were adjusted to border prices by applying the economic conversion factors used at appraisal.
- (iv) Benefits from transferred service roads were evaluated, including about CNY40 million in transferred assets in 2003, and the CNY1.05 million in increased income for local villages per year¹ as a result of the transfer of the roads.
- (v) The benefits gained from avoiding road accidents, mitigating environmental impact, producing non-coal industrial output, and achieving substantial socioeconomic development in and around the station areas have not been quantified.
- (vi) Benefits related to coal production were estimated on the same assumption used at appraisal of a net economic value for coal attributable to the Project of CNY60.0 per ton.
- (vii) Benefits related to traffic were estimated as transport cost savings. A trucking rate of CNY0.7 per ton-kilometer (ton-km) for freight (from 1997) and a bus rate of CNY0.146 per passenger-kilometer (pax-km) for passenger transport (also from 1997), indexed to 1998, were used. After 5% was deducted from these rates for profit and 20% for labor, the result was a net economic road cost of CNY0.525 per ton-km for freight and CNY0.12 per pax-km for passenger transport.

¹ Based on estimates provided by village headmen and provincial government sources.

Table A15: Economic Internal Rate of Return

(CNY million)

Year	Cost		Benefit					Net Cash Flow	
	Project Investment ^a	Railway Operating Cost	Coal Production	Diverted Traffic		Transit Traffic			Increased Income
				Freight	Passenger	Freight	Passenger		
1998	748.3							(748.3)	
1999	208.7							(208.7)	
2000	751.5							(751.5)	
2001	514.6							(514.6)	
2002	259.2							(259.2)	
2003	228.0	71.2	119.8	10.5	0.0	23.8	0.0	1.1	(144.1)
2004		81.6	231.1	44.1	0.0	27.2	8.4	1.1	230.3
2005		114.3	405.1	144.6	23.9	33.0	28.4	1.1	521.7
2006		132.8	593.6	169.7	43.3	33.1	40.7	1.1	748.6
2007		146.2	691.1	182.7	49.5	38.4	43.2	1.1	859.7
2008		159.2	792.4	196.5	55.7	44.5	45.3	1.1	976.3
2009		171.8	896.9	212.8	61.9	49.5	47.0	1.1	1,097.3
2010	24.7	174.3	1,011.8	211.0	68.0	48.0	48.5	1.1	1,189.4
2011		180.7	1,134.1	229.6	74.1	46.6	49.7	1.1	1,354.5
2012		185.4	1,301.5	265.0	74.1	47.5	49.7	1.1	1,553.5
2013		185.4	1,477.8	265.0	74.1	47.5	49.7	1.1	1,729.8
2014		185.4	1,662.9	265.0	74.1	47.5	49.7	1.1	1,915.0
2015		185.4	1,857.0	265.0	74.1	47.5	49.7	1.1	2,109.0
2016		185.4	2,059.8	265.0	74.1	47.5	49.7	1.1	2,311.8
2017		185.4	2,399.8	265.0	74.1	47.5	49.7	1.1	2,651.8
2018		185.4	2,756.1	265.0	74.1	47.5	49.7	1.1	3,008.2
2019		185.4	3,128.8	265.0	74.1	47.5	49.7	1.1	3,380.8
2020		185.4	3,517.6	265.0	74.1	47.5	49.7	1.1	3,769.6
2021		185.4	3,667.5	265.0	74.1	47.5	49.7	1.1	3,919.6
2022	(2,671.8)	185.4	3,820.1	265.0	74.1	47.5	49.7	1.1	6,743.9
NPV (12%) =								3,210.5	
EIRR =								20.8%	

EIRR = economic internal rate of return, NPV = net present value.

^a 1998–2004 data: based on Guizhou Shuibai Railway Corporation financial statements.

Source: Guizhou Shuibai Railway Corporation and consultant estimate.

SOCIAL IMPACT AND POVERTY REDUCTION IN THE PROJECT AREA

A. Introduction

1. The Project is in Guizhou Province, one of the six poorest provinces in the People's Republic of China (PRC). The Project area, in the western region of Guizhou, had inadequate transport infrastructure and widespread poverty, and was therefore considered a priority area for poverty reduction in the province. As a key infrastructure project, the Project has linked up with the Guiyang-to-Kunming and Nanning-to-Kunming railway lines, and the new Neijiang-to-Kunming line.

2. In October 1997, a social analysis report (SA) was prepared by the project preparatory technical assistance consultants. The SA, which was approved by the Asian Development Bank (ADB), met the requirements of ADB's Policy on Poverty Reduction and Gender and Development.

B. Stakeholder Analysis

3. The project stakeholders are the residents along the railway and its peripheral areas, governments at various levels, and agencies providing services. The main stakeholders are as follows:

- (i) **Urban people unaffected by resettlement.** The Project provides convenient access to link counties and cities and fosters both passenger and freight movement. Transport costs are lower and the quality of service is better.¹ As the investment environment has improved, the local economy has achieved higher growth. Urban residents have gained more employment opportunities. The statistical data collected for Luipanshui Municipality indicate that the average net income per urban person in the municipality increased by 23% from 1997 to 2003, from CNY5,046 to CNY6,201.
- (ii) **Rural people unaffected by resettlement.** The Project has provided cheaper and better transportation. Better transport, in turn, has provided more opportunities to grow and market cash crops, thus improving the income of the farmers. More information and better services are now available. The data collected for Luipanshui Municipality show that the average net income per farmer increased by 30% from 1997 to 2003, from CNY1,151 to CNY1,502.
- (iii) **People affected by land acquisition or house relocation or both.** These people have been compensated and resettled through the implementation of the resettlement plan. During project construction, they obtained more employment opportunities. The living conditions of the relocated households have improved. The Project has increased market opportunities for the products of agriculture and sideline jobs. Better transportation has increased access to income-earning opportunities.

¹ Information gathered by the project completion review mission revealed that passenger transport from the project area to Luipanshui has vastly improved. The transport cost per passenger has gone down to CNY11 from CNY55 and transport time has been reduced to 3.5 hours from 5–8 hours.

C. Women in the Project Area

4. Before the Project, women in the project area mostly did household and farm work and had limited opportunities to find employment elsewhere. Since many young males sought work opportunities outside their home village, women stayed at home to work on the farm and to look after the family and house. Their work on the farm is nearly the same as that of men and involves tilling, seeding, carrying fertilizer, harvesting, and raising livestock. However, with better transport, many women, especially among the young, are now seeking employment outside their villages.

5. Most of the representatives from women's federations in the provinces, prefectures, counties, and townships said that women and women's groups were regarded as important by the governments. They were satisfied with the attitude of the public toward the role of women, and expressed appreciation for the employment opportunities provided by the Guizhou Shuibai Railway Corporation (GSRC) and construction contractors. During the civil work construction of the Project, 15% of local non-skilled workers employed by the contractors were women.² Besides in 1998, 33% of the new jobs in other sectors were taken by women. In 1999, CNY2.9 million were provided to the Project area for development programs for women which was five times the allocation in 1998.

D. Poverty Reduction

6. Poverty is not only low income but also the lack of access to opportunities. Improved transportation has reduced travel time and brought many once-inaccessible areas closer to major centers. It has also provided better access to health care, bigger markets, training and education resources, regional transportation hubs, and employment opportunities.

7. Service and link roads and 8,000 square meters (m²) of houses built during the civil works phase were transferred for free to the local villages for their use and management. The villages turned many of these buildings into schools, clinics, and facilities for the elderly. The civil works phase used 4.19 million person-days³ of local labor, much of this supplied by people below the poverty line, who were each paid CNY500–600 per month.

Table A16.1: Service/Access Roads along the Railway

Township	Village	Length (km)	Transport Vehicles Purchased by Villages		Estimated Increased in Income (CNY'000 per village)
			Small Truck	Motorcycle	
Yu She	Hai Gu Tang	3.3	5	7	100
Yu She	Da Ping	4	2	5	50
Du Ge	Ya Kou	15	6	6	100
Yang Mei	Qun Lian	12	5	6	100
Fa Er	Ying Chang	20	7	10	150
Fa Er	Yue Jin	35	6	5	100
Fa Er	Min Zhu	37	5	6	100
Xin Jei	Du Mu Gu	5	1	2	20

² Source: Guizhou Shuibai Railway Corporation.

³ Source Guizhou Shuibai Railway Corporation.

Township	Village	Length (km)	Transport Vehicles Purchased by Villages		Estimated Increased in Income (CNY'000 per village)
			Small Truck	Motorcycle	
Xin Jie	Mao Jiao Duo	4	2	2	30
Ying Pan	Luo Duo	11	2	3	50
Ying Pan	Yu Sa	13	2	2	40
Ying Pan	Luo Ga	23	4	4	80
Ying Pan	Ji Xi Ping	30	5	5	90
Ying Pan	Gan Gou	8	2	4	40
Total		220.3	54	67	

Note: The estimated increased in income for each village is based on estimates from village headmen, whose villages had purchased tractors, small trucks, and motorcycles after the Project. Table A16.2 lists the service/access roads built in the project area, the transport vehicles purchased, and estimated increased in annual income per village. Before the Project the villages owned no transport vehicles.

Source: Guizhou Shuibai Railway Corporation and township governments.

8. Link roads to the stations along the project railway also had a major social impact in the project area and are in various stages of development. Table A16.2 shows the status of the link roads at the various stations.

Table A16.2: Station Link Roads

Station	Length (km)	Status	Standard	Expected Completion	Investor
Liupanshui	1	Existing	Concrete		Local government
Ye She	7	Being constructed	Class 2 bituminous paved	End-2006	Local government
Fa Er	20	Being constructed	Concrete	30 April 2005	Local government
Song He	1	Being constructed	Concrete	End-2005	Local government
San Jia Zhai ^a					
Bai Ji Po ^b					
Mao Cao Ping					
Bai Guo	1	Existing	Concrete		Local Government

^a This link road is being planned by the township government.

^{a&b} These two stations are not yet operating. Link roads will be built when the stations start operating.

Source: Guizhou Shuibai Railway Corporation and township governments.

9. From 1998 to 2002, CNY1.66 billion was invested by the Luipanshui municipal government, Zhongshan District, Shucheng County, and Panxian County in poverty reduction.

10. The population of the villages remained roughly unchanged over the five-year project implementation period. However, the proportion of those who took up jobs outside the villages increased significantly in most villages, particularly in the remote or poorer ones where the employment opportunities were severely limited. More people started working outside the village for the following main reasons:

- (i) They had gained experience and learned skills while building the railway.
- (ii) There was not enough land available for agricultural and cash –crops.
- (iii) Improved transportation also meant better information about employment opportunities elsewhere.
- (iv) Improved transportation made travel more convenient and employment markets more accessible.

11. These factors were a direct result of the Project and the related access roads. Rural net incomes increased by 28.39% from 1997 to 2000. According to the data collected by the Guizhou Social Sciences Academy (GSSA), the population under the poverty line (CNY1,000 per person per year) in the project area decreased by more than 55% from 1998 to 2003, from 461,100 to 206,800. Annex 1 presents the socioeconomic indicators for the project area.

E. Monitoring

12. GSRC contracted an independent resettlement monitoring agency, GSSA, to conduct the external monitoring of poverty reduction and social development in the project area. In 1998 and 1999, GSSA submitted two monitoring reports on poverty reduction and social development to ADB.

F. Conclusions

13. The railway funded under the loan has contributed to economic development in the project areas by providing better, faster, safer, and cheaper access to markets, employment opportunities, and social services. The socioeconomic conditions in the project areas have improved (Table A16.3) and the Project's poverty reduction objectives have been met.

Table A16.3: Socioeconomic Indicators in the Project Area

Indicator	Year	Zhongshan	Shuizheng	Pangxian	Total
Population ('000)	1998	398.4	699.4	1,090.7	2,188.5
	2003	427.0	748.5	1,164.4	2,339.9
	Change (%)	7.18	7.02	6.76	6.92
GDP (CNY million)	1998	2,512.7	703.5	2,439.7	5,656.0
	2003	3,313.2	1,311.9	4,196.7	9,821.8
	Change (%)	71.7	86.4	72.0	73.7
Primary sector	1998	80.2	357.2	532.3	969.6
	2003	90.0	446.3	659.9	1,196.2
	Change (%)	12.3	25.0	24.0	23.4
Secondary sector	1998	1,544.5	216.1	1,325.6	3,086.1
	2003	2,706.5	587.9	2,400.1	5,694.5
	Change (%)	75.2	172.1	81.1	84.5
Tertiary sector	1998	888.0	130.4	581.8	1,600.3
	2003	1,516.7	277.7	1,136.7	2,931.1
	Change (%)	70.8	113.0	95.4	83.2
GDP per capita (CNY)	1998	6,307	1,006	2,237	2,584
	2003	10,101	1,753	3,604	4,198
	Change (%)	60.2	74.2	61.1	62.4

Indicator	Year	Zhongshan	Shuizheng	Pangxian	Total
Revenue of local government (CNY'000)	1998	44.7	37.6	121.4	203.8
	2003	90.4	85.0	220.2	395.6
	Change (%)	102.2	125.9	81.4	94.2
Birth rate	1998				1.84
	2003				1.44
	Change (%)				(21.7)
People below poverty line ('000)	1998	1.82	26.15	17.14	45.1
	2003	1.28	9.19	10.21	20.7
	Change (%)	(29.7)	(64.9)	(40.4)	(54.2)
Average income per farmer (CNY)	1998	1,402	1,120	1,253	1,258
	2003	1,758	1,389	1,566	1,571
	Change (%)	25.4	24.0	25.0	24.8
Average income per worker (CNY)	1998				5,994
	2003				11,721
	Change (%)				95.5

GDP = gross domestic product.

Source: Guizhou Social Sciences Academy.

ETHNIC MINORITY DEVELOPMENT PLAN

A. Introduction

1. In August 1997, a study of 125 of the 615 households affected by the Project was conducted under an Asian Development Bank–financed project preparatory technical assistance (PPTA). According to the results of the study, in the areas affected by the Project the ethnic minorities (Bai, Buyi, Miao, and Yi) compose 38% of the population and 34.7% of those affected by land acquisition and resettlement. Among the minority groups, the Yi and Miao ethnic groups outnumber the rest.

2. During the PPTA, the Guizhou Shuibai Railway Corporation (GSRC) prepared and submitted to ADB an Ethnic Minority Development Plan (EMDP). The plan, which was approved by ADB, met the requirements of ADB's *Policy on Indigenous Peoples*.

3. The external monitoring of the implementation of the development plan for ethnic minorities was entrusted by GSRC to an independent resettlement monitoring agency, the Guizhou Academy of Social Sciences (GSSA). In 1998 and 1999, GSSA prepared and submitted to ADB two monitoring reports on the ethnic minorities. Affected ethnic people actively participated in implementation of EMDP through their representatives and village committees.

B. Organization for Resettlement

4. When the resettlement organizations were set up in the prefectures, counties, and townships, the leaders of the minority affairs committees became members of these resettlement organizations. They played an important role in implementing the resettlement, and advised on the implementation of special assistance programs for minority nationalities. According to the statistics,¹ the ethnic minorities accounted for 25% of the members of prefectural resettlement offices, 76% of the members of county resettlement offices, and 36% of the leaders of all the affected villages and village groups.

C. Resettlement

5. During resettlement, all the land compensation and resettlement subsidies were paid to the ethnic minorities in cash, at their request. A survey of the 80 affected ethnic households indicated that they had cultivated landholdings of more than 0.39 multiple unit (mu)² per capita and they obtained basic subsistence from the land.

6. All the affected ethnic households received total compensation for relocating. The survey results showed that their new houses had a construction area per capita of 22.45 square meters (m²), compared with 18.3 m² in their old houses, which had been demolished.

D. Income Restoration Programs

7. During the construction of civil works, priority was given to the employment of the affected ethnic households. Those employed were paid CNY500–600 per person month, which was much more than what they would get from farming.

¹ Source: Guizhou Social Sciences Academy.

² 1 mu = 0.0667 hectare (ha).

8. It was also deduced from the GSSA monitoring report that each year during the civil works construction more than 200,000 ethnic minority individual farmers in Liupanshui Municipality attended training programs in agricultural production technologies. Survey results showed that at least one person in most of the ethnic households had attended the training.

9. Special microcredit programmes, the terracing of slopes, and the extension of advanced yet practical agricultural technologies in ethnic minority areas helped restore and even improve incomes. Also, access roads were built or upgraded, and other infrastructure, such as electricity, was provided or improved.

E. Conclusions

10. The mitigation measures and income restoration programs raised agricultural output and per capita income among the ethnic minorities. The survey showed that the net income per capita of affected ethnic households increased by 76% between 1997 and 2003, from CNY834 to CNY1,466. The incomes of affected ethnic people increased at a much higher rate (31%), in fact, than the incomes of all affected people. The negative impact on their lives was therefore minimized as their income level significantly improved.

F. Lessons Learned

11. The Monitoring and evaluation of the EMDP was an important part of the overall social impact monitoring and evaluation, which was exclusively targeted for minority issues. The data concerning those issues, such as special land acquisition and housing relocation impacts on the ethnic minorities, living standards of the ethnic minorities before and after resettlement, should be collected systematically. Therefore, the assessment of the EMDP implementation could be made on a more comprehensive and integral basis.