

**PROJECT COMPLETION REPORT**

**ON THE**

**NORTHEAST FLOOD DAMAGE REHABILITATION PROJECT**  
**(Loans 1685/1686/1687-PRC)**

**IN THE**

**PEOPLE'S REPUBLIC OF CHINA**

**December 2003**

## **CURRENCY EQUIVALENTS**

(as of 30 September 2003)

Currency Unit		– yuan (CNY)	
		<b>At Appraisal</b>	<b>At Project Completion</b>
		(23 March 1999)	(30 September 2003)
CNY1.00	=	\$0.1208	\$0.120
\$1.00	=	CNY8.2792	CNY8.30

## **ABBREVIATIONS**

ADB	–	Asian Development Bank
BME	–	benefit monitoring and evaluation
EA	–	executing agency
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
IA	–	implementing agency
IMAR	–	Inner Mongolia Autonomous Region
M&E	–	monitoring and evaluation
MOF	–	Ministry of Finance
NDRC	–	National Development and Reform Commission
O&M	–	operation and maintenance
PCC	–	project coordination consultant
PCR	–	Project Completion Review
PH	–	provincial highway
PIU	–	project implementation unit
PLG	–	project leading group
pm	–	person-month
PMO	–	project management office
PPTA	–	project preparation technical assistance
PRC	–	People's Republic of China
RRP	–	report and recommendation of the President
TA	–	technical assistance

## **WEIGHTS AND MEASURES**

ha	–	hectare
km	–	kilometer
kW	–	kilowatt
m	–	meter
m <sup>2</sup>	–	square meter
m <sup>3</sup>	–	cubic meter
t	–	ton

## **GLOSSARY**

banner	–	A local government administration area.
chaukulun	–	A fenced area of land for growing crops and fodder for feeding livestock.
mu	–	A measurement unit for an area of agricultural land equal to 1/15 <sup>th</sup> of a hectare.

## **NOTES**

- (i) The fiscal year (FY) of the Government coincides with the calendar year.
- (ii) In this report, "\$" refers to US dollars.

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## BASIC DATA

### A. Loan Identification

1.	Country	People's Republic of China		
2.	Loan Nos.	1685/1686/1687-PRC		
3.	Project Title	Northeast Flood Damage Rehabilitation Project (Inner Mongolia Autonomous Region/ Heilongjiang Province/Jilin Province)		
4.	Borrower	People's Republic of China		
5.	Executing Agencies	Inner Mongolia Autonomous Region Heilongjiang Province Jilin Province		
6.	Amount of Loan	L1685	L1686	L1687
		\$110 million	\$110 million	\$110 million
7.	Project Completion Report Number	PCR:PRC 761		

### B. Loan Data (L1685/1686/1687)

1.	Fact Finding/Appraisal			
	- Date Started	18 Jan 1999		
	- Date Completed	12 Feb 1999		
2.	Loan Negotiations			
	- Date Started	20 Mar 1999		
	- Date Completed	22 Mar 1999		
3.	Date of Board Approval	22 Apr 1999		
4.	Date of Loan Agreement	19 May 1999		
5.	Date of Loan Effectiveness (L1685/L1686/L1687)			
	- In Loan Agreement	17 Aug 1999		
	- Actual	27 Aug 1999		
	- Number of Extensions	1		
6.	Closing Date:	L1685	L1686	L1687
	- In Loan Agreement	30 Apr 02	30 Apr 02	30 Apr 02
	- Actual	28 Nov 03	30 Jul 03	21 Feb 03
	- Number of Extensions	1	1	0
7.	Terms of Loan			
	- Interest Rate	Variable	Variable	Variable
	- Commitment Charge	0.75%	0.75%	0.75%
	- Maturity (number of years)	30	30	30
	- Grace Period (number of years)	7	7	7

## 8. Disbursements

## a. Dates

	Initial Disbursement	Final Disbursement	Time Interval
L1685	9 Dec 1999	28 Nov 2003	46 months and 19 days
L1686	10 Dec 1999	30 Jul 2003	43 months and 20 days
L1687	17 Dec 1999	21 Feb 2003	38 months and 4 days

	Effective Date	Original Closing Date	Time Interval
L1685	27 Aug 1999	30 Apr 2002	32 months and 3 days
L1686	27 Aug 1999	30 Apr 2002	32 months and 3 days
L1687	27 Aug 1999	30 Apr 2002	32 months and 3 days

## b. Amount (\$)

**L1685: Inner Mongolia Autonomous Region**

Category	Original Allocation	Last Revised Allocation	Amount Cancelled	Net Amount Available	Amount Disbursed	Undisbursed Balance
01A Civil Works and Materials (Road and Bridges)	54,000,000	60,000,000	0	60,000,000	60,407,467	-407,467
01B Civil Works and Materials (Non-Road Sectors)	35,326,000	40,934,000	0	40,934,000	40,744,873	189,127
02 Equipment (Non-Road Sectors)	1,692,000	523,000	0	523,000	381,630	141,370
03 Consulting Services	738,000	518,000	0	518,000	440,828	77,172
04 Interest During Construction	8,050,000	8,025,000	0	8,025,000	8,025,000	0
05 Unallocated	10,194,000	0	0	0	0	0
Total	110,000,000	110,000,000	0	110,000,000	109,999,798	202

**L1686: Heilongjiang Province**

Category	Original Allocation	Last Revised Allocation	Amount Cancelled	Net Amount Available	Amount Disbursed	Undisbursed Balance
01A Civil Works and Materials (Road and Bridges)	54,000,000	83,356,084	0	55,368,567	83,468,076	-111,992
01B Civil Works and Materials (Non-Road Sectors)	35,326,000	14,789,545	0	45,271,343	14,815,373	-25,828
02 Equipment (Non-Road Sectors)	1,692,000	3,214,371	0	934,135	3,230,559	-16,188
03 Consulting Services	738,000	590,000	0	475,955	435,881	154,119
04 Interest During Construction	8,050,000	8,050,000	0	7,950,000	8,050,000	0
05 Unallocated	10,194,000	0	0	0	0	0
Total	110,000,000	110,000,000	0	110,000,000	109,999,889	111

**L1687: Jilin Province**

Category	Original Allocation	Last Revised Allocation	Amount Cancelled	Net Amount Available	Amount Disbursed	Undisbursed Balance
01A Civil Works and Materials (Road and Bridges)	54,000,000	55,368,567	0	55,368,567	55,368,567	0
01B Civil Works and Materials (Non-Road Sectors)	35,326,000	45,271,343	0	45,271,343	45,271,343	0
02 Equipment (Non-Road Sectors)	1,692,000	934,135	0	934,135	934,135	0
03 Consulting Services	738,000	475,955	0	475,955	475,955	0
04 Interest During Construction	8,050,000	7,950,000	0	7,950,000	7,950,000	0
05 Unallocated	10,194,000	0	0	0	0	0
Total	110,000,000	110,000,000	0	110,000,000	110,000,000	0

9.	Local Costs (ADB Financed)	Appraisal Estimate	Actuals
- Amount (\$ million)		158.00	142.00
- Percent of Local Costs		42	28
- Percent of Total Cost		29	21

### C. Project Data

#### 1. Project Cost (\$ million)

Loan No.	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
L1685	57	126	183	65	209	274
L1686	57	127	184	62	138	200
L1687	58	125	183	61	155	216
<b>Total</b>	<b>172</b>	<b>378</b>	<b>550</b>	<b>188</b>	<b>502</b>	<b>690</b>

#### 2. Financing Plan (\$ million)

Loan No.	Appraisal Estimate			Actual		
	ADB	Borrower	Total	ADB	Borrower	Total
L1685	110	73	183	110	164	274
L1686	110	74	184	110	90	200
L1687	110	73	183	110	106	216
<b>Total</b>	<b>330</b>	<b>220</b>	<b>550</b>	<b>330</b>	<b>360</b>	<b>690</b>

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

Component	Appraisal			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
<b>L1685</b>						
Water Resources						
Infrastructure	10.74	26.89	37.63	7.99	21.00	28.99
Urban Facilities	11.00	23.59	34.59	16.35	35.44	51.79
Roads and Bridges	26.55	75.46	102.01	32.00	144.58	176.58
Project Management	0.58	0.51	1.09	0.19	0.41	0.60
Taxes and Duties	0.00	0.00	0.00	0.00	8.00	8.00
Total Base Cost	48.87	126.45	175.32	56.53	209.43	265.96
Interest During Construction	8.03	0.00	8.03	8.03	0.00	8.03
Total	56.90	126.45	183.35	64.56	209.43	273.99
<b>L1686</b>						
Water Resources	17.90	41.40	59.30	5.89	15.00	20.89
Infrastructure						
Urban Facilities	-	-	-	4.00	6.00	10.00
Roads and Bridges	26.19	76.75	102.94	44.00	110.00	154.00
Others	3.71	8.01	11.72	-	-	-
Project Management	0.82	0.53	1.35	0.29	0.31	0.60
Taxes and Duties	0.00	0.00	0.00	0.00	6.23	6.23
Total Base Cost	48.62	126.69	175.31	54.18	137.54	191.72
Interest During Construction	8.05	0.00	8.05	8.05	0.00	8.05
Total	56.67	126.69	183.36	62.23	137.54	199.77

Component	Appraisal			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
<b>L1687</b>						
Urban Facilities	6.52	14.44	20.96	24.00	53.73	77.73
Roads and Bridges	27.70	74.79	102.49	29.00	94.95	123.95
Other	15.23	35.56	50.79	-	-	-
Project Management	0.58	0.51	1.09	0.19	0.42	0.61
Taxes and Duties	0.00	0.00	0.00	0.00	6.17	6.17
Total Base Cost	50.03	125.30	175.33	53.19	155.26	208.45
Interest During Construction	7.98	0.00	7.98	7.95	0.00	7.95
Total	58.01	125.30	183.31	61.14	155.27	216.41
<b>Summary - Component</b>						
Water Resources	29.00	59.00	88.00	13.88	36.00	49.88
Infrastructure						
Urban Facilities	18.00	32.00	50.00	44.35	95.17	139.52
Roads and Bridges	80.00	196.00	276.00	105.00	349.53	454.53
Others	19.00	37.00	56.00	-	-	-
Project Management	2.00	1.00	3.00	0.67	1.14	1.81
Taxes and Duties	0.00	0.00	53.00	0.00	20.40	20.40
Total Base Cost	148.00	378.00	526.00	163.90	502.24	666.14
Interest During Construction	24.00	0.00	24.00	24.03	0.00	24.03
<b>Total</b>	<b>172.00</b>	<b>378.00</b>	<b>550.00</b>	<b>187.93</b>	<b>502.24</b>	<b>690.17</b>

#### 4. Project Schedule

Items	Appraisal Estimate	Actual
<b>(i) L1685</b>		
Date of Contract with Consultants		
Monitoring & Evaluation Specialist	-	16 Jul 1999
Monitoring & Evaluation Specialist	-	1 Dec 2001
Project Management Specialist	-	16 Jul 1999
Project Management Specialist	-	1 Aug 2001
Completion of Engineering Designs	-	Mar 2000
Civil Works Contract		
Date of Award (First Contract)	-	26 Apr 1999
Completion of Work (Last Contract)	-	15 Oct 2002
Equipment and Supplies		
Dates: First Procurement	-	28 Jun 1999
Last Procurement	-	9 Dec 1999
Completion of Equipment Installation (Yuming Hydroelectricity Power Plant)	-	Oct 2000
Start of Operations	-	Apr 2001
Completion of Tests and Commissioning	-	May 2001
Beginning of Start-Up	-	May 2001
Other Milestones		



Extension of Loan Closing Date	-	20 Apr 2003
Extension of Loan Effectiveness	-	31 Aug 1999
Reallocation of Loan Proceeds	-	9 Feb 2001
Partial Cancellation		28 Nov 2003

**(ii) L1686**

Date of Contract with Consultants		
Project Management Specialist	-	1 Jul 1999
Project Management Specialist	-	16 Aug 2001
Project Management Specialist	-	5 Nov 2002
Monitoring and Evaluation Specialist	-	13 Oct 1999
Monitoring and Evaluation Specialist	-	15 Sep 2001
Completion of Engineering Designs	-	31 Dec 1999
Civil Works Contract		
Date of Award (First Contract)	-	Mar 1999
Completion of Work (Last Contract)	-	Oct 2002
Equipment and Supplies		
Dates: First Procurement	-	May 2001
Last Procurement	-	10 May 2002
Completion of Equipment Installation (Harbin Drainage Station )	-	30 Nov 2001
Start of Operations	-	1 Mar 2002
Completion of Tests and Commissioning	-	30 Jun 2002
Beginning of Start-Up	-	30 Jun 2002
Other Milestones		
Extension of Loan Closing Date	-	30 Apr 2003
Extension of Loan Effectiveness	-	31 Aug 1999
Reallocation of Loan Proceeds		6 Mar 2002
Partial Cancellation		30 Jul 2003

**(iii) L1687**

Date of Contract with Consultants	-	
Monitoring and Evaluation Specialist	-	Nov 1999
Monitoring and Evaluation Specialist	-	Nov 2001
Project Management Specialist	-	19 May 1999
Completion of Engineering Designs	-	1 Jul 2001
Civil Works Contract		
Date of Award (First Contract)	-	12 Apr 1999
Completion of Work (Last Contract)	-	2 Feb 2001
Equipment and Supplies		
Dates: First Procurement (Baicheng Pump Station)	-	1 June 2001
Last Procurement	-	11 Sep 2001
Completion of Equipment Installation	-	Aug 2001
Start of Operations	-	Aug 2001
Completion of Tests and Commissioning	-	Sep 2001
Beginning of Start-Up	-	Oct 2001
Other Milestones		

Extension of Loan Effectiveness	-	31 Aug 1999
Reallocation of Loan Proceeds	-	9 Feb 2001

## 5. Project Performance Report Ratings

### c. Ratings

	Implementation Period	Development Implementation Objectives	Progress
(i)	From May 1999 to Dec 2000	S <sup>1</sup>	S
(ii)	From Jan 2001 to May 2001	HS <sup>2</sup>	HS
(iii)	From Jun 2001 to Nov 2001	HS	S
(iv)	From Dec 2001 to Nov 2002	HS	HS
(v)	From Dec 2002 to Jul 2003	HS	S

## D. Data on Asian Development Bank Missions

### L1685/L1686/L1687

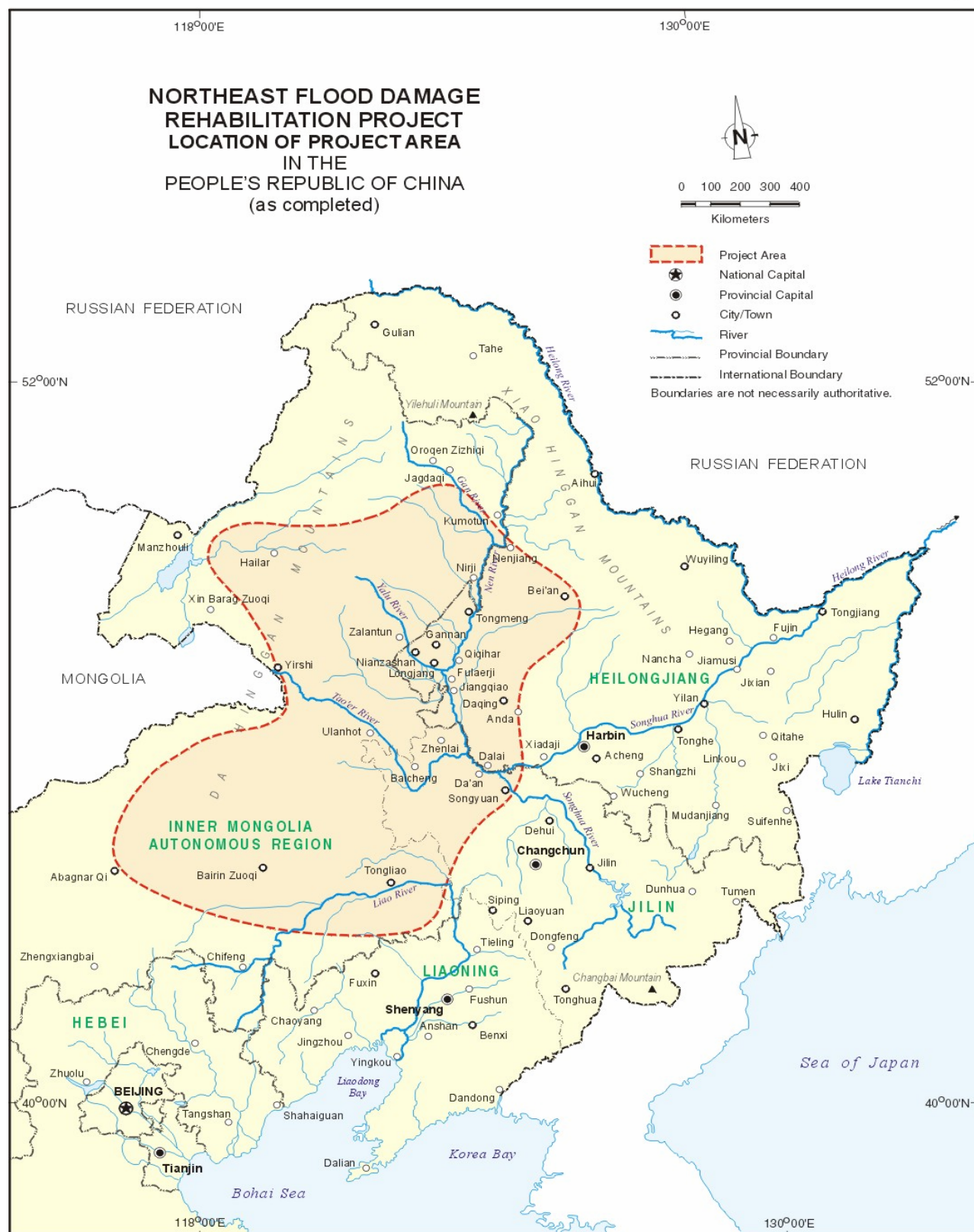
Name of Mission	Date	No. of Persons	No. of Person- Days	Specialization of Members
Fact-finding/Appraisal	19 Jan–12 Feb 1999	12	275.00	a, b, c, d, e, f, g, h, i, j, k
Inception	24 May–18 June 1999	4	26.37	a, l, m, n
Contact	25–28 Sep 1999	1	4.00	A
Review (1)	8–26 Nov 1999	3	57.00	a, n
Review (2)	20 Mar–1 Apr 2000	2	24.00	a, n
Midterm	4–22 Sep 2000	3	57.00	a, n, o
Review (3)	14–31 May 2001	3	54.00	a, n, o
Review (4)	20 Sep–3 Oct 2001	2	22.00	p, n
Review (5)	11–22 Mar 2002	2	24.00	q, n
Review (6)	17 Nov–2 Dec 2002	2	30.00	q, n
Project Completion	8 Sep–1 Oct 2003	3	81.00	q, r, s, t
Review				

a = Sr. Project Specialist; b = Sr. Project Economist; c = Sr. Program Officer; d = Urban Development Specialist; e = Project Economist; f = Project Engineer; g = Social Sectors Specialist; h = Counsel; i = Flood Control Specialist/Consultant; j = Roads Engineer/Specialist/Staff Consultant; k = Manager; l = Environment Specialist; m = Sr. Procurement Specialist; n = Asst. Project Analyst; o = Project Management Specialist/Staff Consultant; p = Project Officer; q = Project Specialist; r = Associate Project Analyst; s = Project Economist/Staff Consultant; t = Local Consultant.

<sup>1</sup> S means "Successful".

<sup>2</sup> HS means "Highly Successful".

Map 1

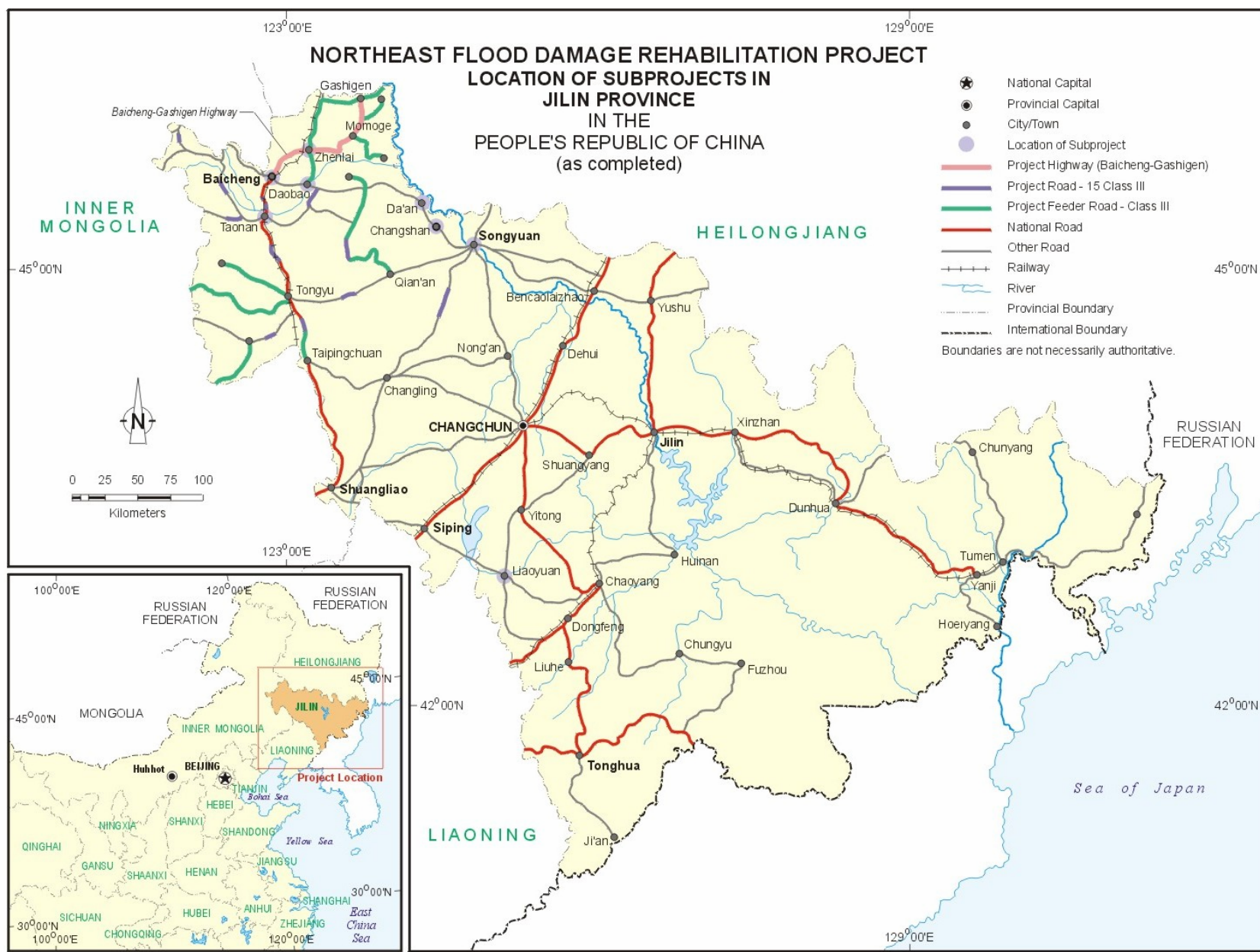






Map 3





## II. PROJECT DESCRIPTION

1. In June to August 1998, heavy rain caused the most severe flooding on record in the Nen, Songhua, and Liao river basins, the 3 main river systems draining the northeast region of the People's Republic of China (PRC). The floods were estimated to have an average recurrence interval of approximately 150 years, and affected the eastern and central parts of the Inner Mongolia Autonomous Region (IMAR), the western parts of Heilongjiang province, and the northern parts of Jilin province (see location maps of Project area and completed subprojects). A total of 154 persons lost their lives. The floods added about 1.8 million new poor people in the region/provinces, and disrupted the social and economic activities of some 16.1 million people (6.5 million in IMAR, 8.5 million in Heilongjiang province, and 1.1 million in Jilin province), damaging houses, crops, livestock, fish farms, commercial premises, and infrastructure including roads, bridges, railways, power transmission, irrigation systems, water storage and reticulation, sewerage reticulation, drainage systems, and flood protection facilities.<sup>1</sup> Direct damage costs to IMAR, and Heilongjiang and Jilin provinces were estimated at \$1.8 billion, \$3.6 billion, and \$1.7 billion, respectively. Although the Government met the immediate most critical needs of the affected populations, in November 1998 it requested assistance from the Asian Development Bank (ADB) for the rehabilitation of flood-damaged infrastructure facilities.

2. The objective of the Project was to assist the Government to restore normal levels of economic and social activity by rehabilitating and carrying out essential improvements on critical infrastructure damaged by the floods and their after-effects in IMAR and Heilongjiang and Jilin provinces. Three separate emergency loans of \$110 million each were provided to IMAR and Heilongjiang and Jilin provinces to help finance rehabilitation of flood-damaged facilities in 3 key sectors: (i) water resources infrastructure; (ii) urban facilities; and (iii) roads and bridges, covering the roads, highways, and bridges linking major towns and cities. In Jilin province, the rehabilitation of facilities covered only two sectors—urban facilities and roads and bridges.

3. The Project followed a sector approach with the rehabilitation works selected, implemented, and financed on a subproject basis grouped by sector. The Borrower was responsible for the selection of the subprojects, which had to satisfy certain criteria (see Appendix 2 of the Report and Recommendation of the President [RRP]). A feasibility report had to be submitted to ADB for approval before any bidding, contract award, or other implementation activity took place, if a subproject required a resettlement plan, an environmental impact assessment (EIA)—i.e., it was a Category A subproject—or the estimated total cost of the subproject was more than \$10 million equivalent. The feasibility study reports had to demonstrate an economic internal rate of return (EIRR) of no less than 12% (10% if there were significant nonquantified benefits) if the estimated subproject cost exceeded \$10 million. For the other subprojects, a feasibility report had to be submitted to ADB for ex-post approval within 6 months of subproject implementation, except that the first draft contract for civil works in each sector and in each province or region had to be reviewed by ADB before contract award. The loans only financed “eligible works,” i.e., only those parts of the infrastructure damaged by the 1998 flooding in the project area. However, consistent with ADB emergency loan procedures, ADB adopted a flexible approach, allowing rehabilitation works to include increases in flood protection standards and, in the case of roads and bridges, allowing increases in traffic capacity within limits agreed between ADB and the Government. Also, government funds were used to

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<sup>1</sup> ADB. 1998. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the People's Republic of China for the Northeast Flood Damage Rehabilitation Project*. Manila; and Project Management Office. 2002. *Northeast Flood Damage Rehabilitation Project (Jilin Province), Project Completion Report* (ADB Loan 1687-PRC).

finance “ineligible” works augmenting the scale and scope of works under the various subprojects in an efficient manner.<sup>2</sup>

4. The scope of the water resources infrastructure and urban facilities sectors included subproject preparation, civil works, equipment, and construction supervision. This was also the case for the roads and bridges sector, except that no equipment purchases were made.

### **III. EVALUATION OF DESIGN AND IMPLEMENTATION**

#### **A. Relevance of Design and Formulation**

5. Given the disastrous impact of the 1998 floods on the infrastructure in the project area and the need for assistance to restore the economic and social activities of the populations affected, the Project was highly relevant and consistent with ADB’s 1997 Country Operational Strategy, which focused on reducing poverty in inland provinces by promoting economic growth. The project area covers many poverty stricken and minority counties (see Appendix 1). Because the loans for the Project were processed as emergency loans, there was no project preparatory technical assistance (PPTA). However, project feasibility reports had to be prepared for each of the subprojects by the various implementing agencies (IAs); these reports assessed not only the least-cost methods of rehabilitating damaged infrastructure, but also the appropriateness of adding capacity, extending the scope of works to replace undamaged but aging or otherwise inadequate infrastructure, and the enhancement of service levels. Such improvements were incorporated in subprojects where the selection criteria allowed them or where sufficient government funding for ineligible expenditure could be secured.

6. The ineligible works under the Project, funded entirely by the Government, involved the provision of additional capacity in roads and bridges to meet growth in demand or necessary infrastructure replacement rather than rehabilitation of flood damage. The inclusion of such investment under the Project was highly desirable from a life cycle least-cost and economic efficiency perspective. The subproject appraisal criteria were not required to be applied to the ineligible works, but since ineligible works related to additional capacity for the eligible works, the subproject appraisal criteria were effectively applied to both eligible and ineligible works. This flexible approach to project design was especially appropriate given the rapid economic growth and urbanization experienced in the project area over the implementation period. Also, there were several instances where the damaged infrastructure was reaching the end of its economic life even before being damaged by the floods.

7. During project implementation, a number of the water resources infrastructure candidate subprojects identified at fact-finding/appraisal were eliminated or downsized, with consequent increased funding of urban facilities and roads and bridges subprojects. Frequently, this was due to an inability to secure sufficient counterpart funding for water resources infrastructure subprojects and availability of counterpart funding for subprojects in the other two sectors. However, in turn, this reflected higher priority being given to urban facilities and roads and bridges rehabilitation and upgrading. This was desirable given the high rates of economic and population growth in the major towns and cities in the project area, the rural to urban drift of population, and the rapidly increasing use of road vehicles in the project area. It was also consistent with the generally lower EIRRs associated with the water resources infrastructure subprojects.

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<sup>2</sup> It was in many cases more efficient to implement increases in infrastructure capacity at the same time as undertaking rehabilitation of existing capacity, rather than at a later time.



8. Because final subproject selection, design, and implementation were the responsibility of the IAs,<sup>3</sup> stakeholder ownership of, and involvement in, the various subprojects was (and continues to be) high for the various IAs and related municipal government agencies involved in the subprojects' ongoing operation and maintenance (O&M). Beneficiary ownership and involvement were limited by the public good nature of the facilities involved and the urgent need for their rehabilitation, which prior to the 1998 floods had provided essential services to the populations affected.

## B. Project Outputs

9. At fact-finding/appraisal, an indicative list of 62 candidate subprojects was identified<sup>4</sup> and 56 subprojects were implemented under the Project. However, as noted above, there were considerable changes in the composition, scale, and scope of the various subprojects implemented compared to the indicative list identified at appraisal. Table 1 shows the number of subprojects identified at appraisal and those actually implemented under the Project by sector and by province/region.

**Table 1: Number of Subprojects at Appraisal and as Implemented**

	At Appraisal				As Implemented			
	IMAR	Heilongjiang	Jilin	Total	IMAR	Heilongjiang	Jilin	Total
Water Resources	17	1	0	18	10	1	0	11
Infrastructure								
Urban Facilities	10	0	2	12	23	1	6	30
Roads and Bridges	8	9	15	32	5	6	4	15
<b>Total</b>	<b>35</b>	<b>10</b>	<b>17</b>	<b>62</b>	<b>38</b>	<b>8</b>	<b>10</b>	<b>56</b>

IMAR = Inner Mongolia Autonomous Region.

Source: ADB and Borrower's PCRs

10. The table shows that the number of water resources infrastructure subprojects implemented in IMAR is considerably lower than anticipated at appraisal and this reflects a reduction in relative priority for these subprojects. This is also shown in the lower level of overall costs for water resources subprojects for IMAR (see Basic Data, page iii) and the reduction in scope and cost for the single water resources infrastructure subproject for Heilongjiang, which occurred during its implementation.<sup>5</sup> A list of the subprojects, their outputs, and costs is contained in Appendix 2.

11. The number of roads and bridges sector subprojects implemented is also less than was identified at appraisal. However, this reflects combining together smaller subprojects into a reduced number of larger subprojects. As can be derived from the data in Appendix 3, roads and bridges accounted for 69%, 82%, and 62% of subproject costs for IMAR, Heilongjiang, and Jilin, respectively.

<sup>3</sup> Albeit subject to the eligibility criteria agreed at the time of project preparation and advance approval by ADB, in the case of certain subprojects.

<sup>4</sup> Appendix 4 of the RRP.

<sup>5</sup> The Nanyin reservoir subproject was included in the original list at appraisal and the original cost estimate submitted for inclusion in the Project Administration Manual was CNY521.9 million (\$63 million). The final cost for this subproject was CNY157.1 million (\$18.9 million), reflecting substantial reductions in the scope of works undertaken. (Appendix C of Northeast Flood Damage Rehabilitation Project. Loan 1686-PRC Heilongjiang Province. Final Report. Project Management Office. Heilongjiang Provincial Planning Commission. December 2002).

12. The possibility of reprioritization of subprojects between the different sectors was anticipated at appraisal. It had only a minor impact on the period of project implementation and is consistent with maximization of overall project benefits.

13. Among the project outputs are irrigation facility rehabilitation for 73,000 hectares (ha); 4 reservoirs repaired having a total capacity of 592 million cubic meters (m<sup>3</sup>); 1 hydropower station reconstructed with a capacity of 1,500 kilowatts (kW); 1,727.94 kilometers (km) of highway rehabilitated; 3 large highway bridges having a combined length of 1,085 m; 4 urban road bridges having a combined length of 665 meters (m); 103.78 km of urban roads rehabilitated; 6 water supply and treatment plants rehabilitated and expanded having a total capacity of 68,000 m<sup>3</sup>/day; and 8 rehabilitated drainage pump stations.

### C. Project Costs

14. The total project cost of eligible works at appraisal was \$550 million, of which the foreign costs were \$172 million (31%), including \$24 million in interest during construction, and local costs were \$378 million (69%), including duties and taxes. The actual project cost of eligible works was \$690 million, of which foreign costs were \$188 million (27%) and local costs were \$502 million (73%), including duties and taxes. A summary of project cost by component at appraisal and as actually implemented is shown in Table 2.

**Table 2: Project Costs Summary**  
(\$ million)

Component	Appraisal				Actual			
	Foreign Exchange	Local Currency	Total	%	Foreign Exchange	Local Currency	Total	%
Water Resources Infrastructure	29.00	59.00	88.00	16.00	13.88	36.00	49.88	7.00
Urban Facilities	18.00	32.00	50.00	9.00	44.35	95.17	139.52	20.00
Roads and Bridges	80.00	196.00	276.00	50.00	105.00	349.43	454.53	66.00
Others	19.00	37.00	56.00	10.00	-	-	-	-
Project Management	2.00	1.00	3.00	1.10	.67	1.14	1.81	0.30
Taxes and Duties	0.00	53.00	53.00	10.00	0.00	20.40	20.40	3.00
Interest During Construction	24.00	0.00	24.00	4.00	24.03	0.00	24.03	3.00
<b>Total</b>	<b>172.00</b>	<b>378.00</b>	<b>550.00</b>	<b>100.00</b>	<b>187.93</b>	<b>502.24</b>	<b>690.17</b>	<b>100.00</b>
% of Total	31.00	69.00	100.00		27.00	73.00	100.00	

Source: ADB and Borrower's PCR

15. At appraisal, an amount of \$56 million, which was allocated for "Others" as can be seen in Table 2, was subsequently allocated to the urban facilities and roads and bridges sectors. In addition, the original allocation of \$88 million for the water resources infrastructure sector was in part (\$36 million) reallocated to the other two sectors. The appraised and actual financing plan for the Project are compared in Table 3. Details of project costs by component, financier, and eligible and ineligible costs for the 3 separate loans are shown in Appendix 3. The ineligible works funded by the Government were only for roads and bridges sector subprojects. The nonavailability of counterpart funding for water resources subprojects and the availability of counterpart funding for the other sector subprojects resulted in all of the unallocated loan amount being used for urban facilities and roads and bridges sector subprojects, and in some of the funding allocated for water resources infrastructure sector projects being reallocated to the other two sectors. This reflected comparatively higher economic returns associated with investment in urban facilities and roads and bridges (Appendix 9).

**Table 3: Financing Plan Summary**  
(\$ million)

Source	Appraisal				Actual			
	Foreign Exchange	Local Currency	Total	%	Foreign Exchange	Local Currency	Total	%
A. Eligible Works								
ADB	172	158	330	60	188	142	330	48
Government	0	220	220	40	0	360	360	52
<b>Subtotal</b>	<b>172</b>	<b>378</b>	<b>550</b>	<b>100</b>	<b>188</b>	<b>502</b>	<b>690</b>	<b>100</b>
B. Ineligible Works								
Government	60	170	230	0	30	84	114	
<b>Total</b>	<b>232</b>	<b>548</b>	<b>780</b>		<b>218</b>	<b>586</b>	<b>804</b>	

ADB = Asian Development Bank.

Source: ADB and Borrower's PCRs

#### D. Disbursements

16. Out of the total loan amount of \$330 million,<sup>6</sup> a total of \$329,999,687 has been disbursed. Loan 1687 was fully utilized, while the undisbursed balances of \$111 for Loan 1686 and \$202 for Loan 1685 were cancelled. The Loan accounts were closed on 21 February 2003, 30 July 2003, and 28 November 2003, respectively.

17. At midterm review, the 3 executing agencies (EAs) sought approval to reallocate loan proceeds to enable the share of loan funds for roads and bridges to exceed the \$60 million ceiling given in their respective loan agreements (Article III, Section 3.02). ADB approval was given on 6 September 2000. A summary comparison between the original and eventual allocation for the aggregate of the 3 loans is given in Table 4.

**Table 4: Summary Reallocation Table**

Ref. No.	Description	Original Allocation			Revised Allocation		
		Category	Subcategory	%	Category	Subcategory	%
01	Civil Works and Materials	267,672,000			297,834,000		
01A	Civil Works and Materials (Roads & Bridges)		162,000,000	57		194,900,000	57
01B	Civil Works & Materials (Non Road Sectors)		105,672,000	57		102,934,000	57
02	Equipment (Non Road Sectors)	5,923,000		100	6,533,000		100
03	Consulting Services	1,756,000		100	1,608,000		100
04	Interest During Construction	24,056,000		100	24,025,000		100
05	Unallocated	30,593,000		100	0		
	<b>Total</b>	<b>330,000,000</b>			<b>330,000,000</b>		

Source: ADB

18. Initially, the EAs/IAs did not know how to use retroactive financing for urgent works carried out after loan appraisal and how to prepare withdrawal applications for force account works. Also, the EAs failed to make sufficient use of the imprest accounts, which were intended

<sup>6</sup> \$110 million for each of the three loans.

to help them overcome cash-flow difficulties in prefinancing project expenditures. The ADB review missions assisted the EAs to prepare withdrawal applications for the initial deposits to the imprest accounts, and guided the EAs/IAs on all the necessary disbursement procedures for submitting claims to ADB. Withdrawal applications were submitted for retroactive financing of urgent works carried out between 12 February 1999 (appraisal mission) and 27 August 1999 (loan effectiveness) and disbursements were made within the prescribed \$11 million allocation for each region/province.

19. The use of imprest accounts enabled IAs to pay advances to contractors, purchase small amounts of equipment or materials, engage consultants, and cover any small expenses using ADB's statement of expenditure procedures. The imprest accounts of the EAs were well maintained. Annual disbursements under the 3 loans are shown in Appendix 4.

## **E. Project Schedule**

20. The implementation of the Project was originally planned for 30 months from 1 May 1999 to 31 October 2001, with a period of loan utilization extending six months beyond the project completion date to 30 April 2002. This estimated completion date was met in the case of Jilin province, but was extended by 12 months each in both IMAR and Heilongjiang province to 31 October 2002 with a loan utilization period to 30 April 2003.

21. Among the factors that contributed to the implementation period extensions in IMAR and Heilongjiang province were:

- (i) limits on the availability of counterpart funds due to a succession of natural disasters;
- (ii) the preparation and approval of bid documents taking longer than expected;
- (iii) full extent of flood damage could not be assessed until the summer of 1999;
- (iv) revisions being made to the scale and scope of subprojects, because the emergency situation meant limited project preparatory work at appraisal;
- (v) feasibility study reports, bid evaluation reports, and EIA reports taking longer to prepare than expected; and
- (vi) delays in obtaining ADB approvals on documents submitted to ADB (para. 37), during the peak implementation period.

However, given the short 5-month construction season per annum in the project area due to the harsh winter conditions, the size and scope of the Project and the number and dispersed nature of the various subprojects (in IMAR especially), progress on the physical works for each of the subprojects in IMAR and the two provinces was generally very good, with the majority of contracts being completed within the contract periods stipulated (para. 34).

## **F. Implementation Arrangements**

22. The project implementation arrangements as envisaged at appraisal were appropriate and were maintained throughout the implementation period. The Borrower, Ministry of Finance (MOF) of the PRC, onlent the loans to the governments of IMAR and of Heilongjiang and Jilin provinces as the EAs, which subsequently onlent the proceeds to designated IAs at the municipal government level (i.e., at the city or county level). A project implementation organization chart reflecting the 3 levels of government involved is shown in Appendix 5 of the RRP.

23. At the national level, the National Development and Reform Commission (NDRC)<sup>7</sup> and MOF coordinated interagency issues and monitored the Project and resolved any conflict or potential problems at the national level. The NDRC took the lead role and was responsible for overall project coordination, and approved and promulgated policies related to flood rehabilitation activities. MOF was responsible for releasing loan funds to the EAs, monitoring the timely provision of counterpart funds to the IAs, ensuring that sound financial records were maintained, and ensuring that the project accounts were audited and submitted to ADB in accordance with the schedules agreed between ADB and the central Government.

24. At the regional level, the EAs each established project leading groups (PLGs) to act on their behalf. They were headed by vice governors and included senior representatives of the respective planning commissions, finance departments, communications departments, water resources departments, construction departments, and other relevant provincial/regional government agencies. The PLGs were assisted by project management offices (PMOs), established by each of the EAs to carry out its duties and responsibilities on a day-to-day basis. Each of the PMOs was assisted by a project coordination consultant (PCC) team consisting of 1 international project management specialist, 3 domestic specialists (one for each sector), 1 translator, and 1 administrative assistant.<sup>8</sup> Among the tasks of the PCC teams were reviewing and finalizing the various reports prepared by the local government level project implementation units (PIUs), ascertaining the amount of eligible costs and ADB financing in each subproject, and preparing quarterly progress reports and other reports required by ADB.

25. At the municipal government level, PIUs were established for each subproject, utilizing appropriate staff from within each of the IAs. They were responsible for subproject preparation, including feasibility studies and reports, detailed design, and documentation; calling for bids and awarding contracts for civil works, supply of materials, and procurement and installation of equipment; subproject implementation and contract management; processing applications for payment to contractors; reporting to their respective PLG; and maintaining records on the financial and physical progress of works. The PIUs were established within the existing framework of each IA, avoiding the need to create unnecessary additional unsustainable entities.

26. The implementation arrangements for the Project generally worked well, except in 2 areas:

- (i) At appraisal, it was anticipated that the PMOs would be adequately staffed by qualified full-time staff from the departments represented on the respective PLGs.<sup>9</sup> However, the PMO counterpart staff were not engaged full time but also maintained their previous responsibilities within their departments. This created difficulties and delays, especially in the processing of withdrawal applications and monitoring the financial performance of the Project. The EAs should have allowed full-time secondment of some staff during periods when the PMOs were under a heavy workload; and
- (ii) The single international monitoring and evaluation (M&E) specialist, whose 3.75 months input<sup>10</sup> was spread over IMAR and the 2 provinces and over 4 separate

<sup>7</sup> Previously called the State Development Planning Commission.

<sup>8</sup> In addition, a single international monitoring and evaluation special consultant was engaged on a periodic basis as part of the 3 PCC teams (see paras. 30 and 33).

<sup>9</sup> Para. 69 of the RRP.

<sup>10</sup> Initially set at 3 person-months but raised to 3.75 person-months during project implementation.

visits to the PRC, was limited in his ability to foster a sustainable interest in benefit monitoring and evaluation (BME) activities among the various EAs and IAs (para. 33). While more time could have been allotted to the BME specialist, it would still have been difficult to engender greater enthusiasm for M&E activities during project implementation.

## **G. Conditions and Covenants**

27. The conditions of loan effectiveness were met expeditiously and the 3 loans were declared effective on 27 August 1999. All major loan covenants were generally relevant and were all complied with. The status of compliance with the loan covenants is presented in Appendix 6.

28. The reporting requirements have been substantially complied with. The 3 EAs submitted their quarterly progress reports regularly and each submitted their project completion reports as required and in accordance with ADB's format. Audited financial statements were submitted generally on time, and only one last statement for the 3 loans remains for submission as of end-2003.

## **H. Related Technical Assistance**

29. Because of the emergency nature of the Project, no technical assistance (TA), including PPTA, was provided.

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

30. At fact-finding/appraisal, it was anticipated that 69 person-months (pm) of international and 270 pm of domestic consultants would be required to assist the PMO with subproject selection and implementation supervision, and to establish a project monitoring and evaluation system. Two international consulting firms were engaged in accordance with ADB's *Guidelines on the Use of Consultants*, and 4 contracts were awarded providing 69.28 pm of 3 international project management specialists, 1 each for the province/region and one international M&E specialist for all of them. The Government financed the cost of the domestic consultants, for a total 262 pm, who were engaged on an individual basis in accordance with procedures satisfactory to ADB. As compared to the requirement of 90 pm for each region/province estimated at appraisal, the domestic consultants were engaged for 100 pm in IMAR, 112 pm in Heilongjiang province, and 50 pm in Jilin province. The availability of qualified in-house expertise, particularly in Jilin province, had reduced its need for domestic consultants. The consulting services expertise and inputs are detailed in Appendix 7.

31. The civil works contracts for the Project were mostly procured through local competitive bidding procedures among prequalified local contractors, which were acceptable to ADB. Small civil works were carried out by the EAs on a force account basis. No foreign bidder participated in the local competitive bidding although they were allowed to do so. Vehicles and major equipment were procured using international shopping and international competitive bidding while small amounts of materials and equipment contracts were procured through direct purchase. ADB also approved advance action from the date of appraisal (12 February 1999) for procurement of civil works and equipment and for recruitment of consultants. Included under advance procurement action were urgent eligible works through force account arrangements. However, the EAs/IAs were not able to effectively utilize this facility. Initially, the EAs/IAs encountered difficulties in preparing the bid documents, and in particular, had evaluated bids

following procedures that involved weighting factors and the elimination of bids that were more than 15% above, or more than 5% below, the engineer's estimate for the works. This resulted in the rejection of some contract awards proposed by the EAs. ADB provided training in procurement in the 2 provinces and the autonomous region, which helped familiarize the EAs/IAs with ADB's procurement procedures. No subsequent procurement delays were experienced. Appendix 8 shows a detailed list of items procured under the Project.

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

32. The consulting firms performed satisfactorily and contributed to the success of the Project, despite some initial problems due to the lack of counterpart local PMO staff, vehicles, and office and accommodation facilities in the case of IMAR and Heilongjiang province. During the initial stages of the Project, the input from the international project management specialist was continuous with a full-time requirement to assist with documentation in relation to expenditure eligibility and feasibility, and to subproject preparation and approval. At the end of the construction season in October 2000, the requirement became intermittent with the main focus being disbursement issues. The lack of experience of a number of the IAs in the implementation of internationally financed projects meant that the international project implementation specialists played a vital role in liaison between the IAs, PMOs, EAs, and ADB.

33. The international M&E specialist achieved only limited results. In part this was due to the limited in-field time available given that the 3.75 pm provided under the Project was spread over IMAR and the 2 provinces and over 4 trips to PRC. Also, at a time of exceptional economic growth in the project area accompanied by high demands for capital expenditure on new infrastructure capacity, it was difficult for M&E of completed infrastructure projects to be given priority over planning and design of new facilities by the EAs and IAs. Some fairly broad measures of environmental and economic impacts were gathered from site visits, as well as from a series of focus group meetings and surveys of intended residential and commercial/industrial beneficiaries for a sample of 8 of the 56 subprojects.<sup>11</sup> However, the M&E work undertaken might have been more useful had it been better integrated with the feasibility study work undertaken initially for the various subprojects in the sample. For example, at the time of the Project Completion Review (PCR) mission, it appeared that very few<sup>12</sup> of the EIRR calculations for some of the subproject feasibility studies had been recalculated as part of ongoing M&E (Appendix 9).

34. The domestic consultants under the Project generally performed satisfactorily and significantly contributed to the success of the Project. The quality of works completed by the local contractors under the Project was generally high and the works were usually completed on time, as observed by the PCR and earlier missions. The suppliers of equipment installed under the Project performed satisfactorily.

<sup>11</sup> Two water resources infrastructure subprojects, 1 urban facilities subproject, and 1 roads and bridges subproject in IMAR; 1 urban facilities subproject and 1 roads and bridges subproject in Heilongjiang province; and 1 urban facilities subproject and 1 roads and bridges subproject in Jilin province.

<sup>12</sup> The BME completion report for Jilin province (dated July 2002) states that the EIRR for the Zhenlai County Water Supply subproject had been recalculated and "shows a pretax EIRR of 19%". Given the use of the term "pretax," this is presumably a financial internal rate of return calculation based on the water supply company's past, current, and forecast cash flows.

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

35. The performance of the Borrower, EAs, IAs in IMAR and Heilongjiang and Jilin provinces is rated as satisfactory. Initial problems associated with the provision of staffing and facilities for the PMOs and unfamiliarity with ADB requirements, procedures, guidelines, and documentation were eventually overcome. Counterpart funding for the Government's share of eligible works was generally<sup>13</sup> made available in a timely fashion as was additional funding to cover ineligible but desirable additions to flood-damaged facilities rehabilitated under the Project. Generally, works have been completed to a high standard (especially in the roads and bridges sector) and satisfactory arrangements have been made in handing over facilities for their ongoing operation to either existing or newly established state-owned enterprises or appropriate departments within the IAs. Adequate budgets are available for ongoing O&M requirements.

36. Despite the Project's limited preparation time, multisector nature, high overall cost, and numerous discrete and highly dispersed subprojects, the Government of the PRC, the EAs, and the numerous IAs have combined successfully to achieve the Project's objective.

## **L. Performance of ADB**

37. The performance of ADB is considered satisfactory in its timely response to assist the Government in undertaking the rehabilitation works, and in processing the loan expeditiously. The project design took into account the lessons learned from ADB's experience with rehabilitation assistance after disaster, to minimize delays and implement urgently needed works as soon as the weather conditions permitted. ADB fielded semiannual review missions, which helped in identifying and resolving problems as they occurred, to facilitate smooth implementation. However, due to internal resource constraints, ADB was not able to act promptly in the review of the feasibility study reports, particularly during the peak implementation period. This constraint was quickly overcome with the recruitment of a staff consultant who assisted in the review, and it did not have any major implications for the implementation schedule. ADB's resident mission in the PRC facilitated processing of withdrawal applications by prescreening these prior to their submission to headquarters. ADB also adopted a flexible approach in allowing the reallocation of funds between sectors and agreeing to revise candidate subprojects based on their relative priority during project implementation.

# **IV. EVALUATION OF PERFORMANCE**

## **A. Relevance**

38. The Project as an emergency response to a major climatic disaster was highly relevant in seeking to restore the economic and social activities of the populations affected. The Project was consistent with ADB's 1997 Country Operational Strategy, which focused on reducing poverty in inland provinces by promoting economic growth, and with the national program of the Government to rehabilitate flood-damaged public infrastructure covering both the Yangtze valley and northeast PRC. Previous levels of infrastructure capability and capacity were not only restored but also enhanced across a range of sectors. The completed subprojects generally reduced the rehabilitated infrastructure's susceptibility to future flooding. These are consistent with increasing demand for infrastructure services as a consequence of the high levels of

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<sup>13</sup> Exceptions were 2 water resources infrastructure sector subprojects—Hairisu irrigation scheme and Nanyin reservoir.



economic growth and urbanization and an increasing tendency toward the use of road vehicles in the project area. These additional benefits were facilitated by the flexibility in the original project design, the manner in which ADB responded to various requests during project implementation, and the EAs and most of the IAs having design and implementation capabilities as well as the ability to secure additional counterpart funding for eligible and ineligible works.

## **B. Efficacy in Achievement of Purpose**

39. The Project's immediate objective was to restore the capability of the populations affected by the 1998 floods and enable them to resume their economic and social activities; this has been successfully achieved. While immediate post-flood remedial works prior to the Project's implementation went some way toward achieving this objective, a major short-term benefit of the Project was the creation of 17,700 additional jobs in each of IMAR and Heilongjiang and Jilin provinces for unskilled rural and urban workers during the project implementation period. Typically these jobs were for the 5 months per annum construction season, paying around CNY20–30 per day for 30 days per month (i.e., an addition of around CNY3,000–4,500 in annual family income).<sup>14</sup> Meals and accommodation were provided free in addition to wages. This was an extremely useful supplement to normal incomes in the project area, especially for those farm families whose crops were destroyed in the 1998 floods.

40. Beyond the immediate term, the Project has provided the necessary rehabilitation (and expansion) of infrastructure capability to underpin the rapid expansion and urbanization of the economy in the project area. Given the generally high quality of the works completed, the increased protection of the rehabilitated (and expanded) infrastructure provided under the Project, and the availability of sufficient funding for ongoing O&M expenditure, the benefits of the Project are expected to be sustained in the future.

## **C. Efficiency in Achievement of Outputs and Purpose**

41. Since the loans were processed under ADB's emergency procedures, no EIRR for the Project was calculated at the time of appraisal. For some subprojects,<sup>15</sup> EIRR analyses were undertaken and their results included in the feasibility study reports. Unfortunately, there has been no systematic updating of these EIRR estimates as part of the M&E follow up. Appendix 9 provides some discussion on these benefits with reference to likely EIRRs for subprojects visited during the PCR Mission. From these and other broad measures of economic benefit collected during the PCR Mission, the following conclusions can be drawn about the Project's efficiency:

- (i) The Project has led to enhanced levels of flood protection for much of the rehabilitated, expanded, and upgraded infrastructure. Also, various additional flood protection measures have been included for people and property in the flood zone. The expected annual savings in direct and indirect flood damage need to be added to the benefits provided by the rehabilitated and upgraded infrastructure in the 3 sectors;

<sup>14</sup> The 5-month construction period over summer meant that unskilled rural workers could return to their family farms to contribute to the additional labor requirements at harvest time in autumn. During the summer construction, season workers' family members could maintain farming activities, meaning that the wages earned under the Project for unskilled workers from rural areas were additional to farm family earnings from normal farming activities.

<sup>15</sup> Those for which estimated costs exceeded \$10 million.

- (ii) Although only limited updated information is available on traffic counts on the various roads and bridges sector subprojects and the urban roads part of urban facilities sector subprojects, the rapid rates of economic growth and urbanization and the trend toward increased use of road vehicles suggests significant traffic growth; therefore, economic benefits in the form of vehicle operating costs and travel time savings have been achieved by these subprojects;
- (iii) The irrigation subprojects in the water resources infrastructure sector seem likely to have relatively low rates of return. Because of the harsh winter conditions in the project area, only single cropping of paddy and other low value crops is possible and these have limited net returns;
- (iv) For the urban facilities sector subprojects, the economic benefits are difficult to quantify. While there is little doubt that the infrastructure rehabilitated and improved under the Project has contributed to higher rates of economic growth, inflows of investment from abroad and other parts of the PRC, higher land prices, and generally more prosperous economic conditions in the project area, so too will have other factors. Also, within a particular urban area, the rehabilitation and upgrading of infrastructure will usually divert trade and the demand for land from other locations within the same urban area. Such effects are only transfers and not net national economic benefits. This makes it difficult to obtain accurate measures of economic benefits, which are not overstated.

For all subprojects, the feasibility studies, which were given prior or ex-post approval by ADB, included least-cost analysis of the engineering solutions implemented.

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

42. The Project has a high likelihood of future sustainability. Flood protection measures have been incorporated in the new works, which have been designed to withstand floods having return periods in excess of 100 years for major roads and bridges, between 25 and 50 years for minor roads and bridges, and at least 50 years for rural water infrastructure. In urban areas, storm water drains have now been provided for many of the rehabilitated urban roads and a number of subprojects include the provision of improved drainage reticulation and pump stations. Generally, the project works visited during the PCR Mission were of a high standard and had been satisfactorily maintained (although there has been limited time since their completion for the infrastructure to deteriorate). However, since project completion, there have also been no major flood events to test the susceptibility of the facilities, and in fact, drought conditions have prevailed.

43. O&M budgets appear to be adequately financed throughout the project area for the various infrastructure facilities rehabilitated under the Project. In the case of roads and bridges, the various communications departments appear to receive sufficient income for O&M from a combination of toll revenue, annual vehicle license fees, and direct allocations from central, provincial/regional, and municipal governments. Water charges are now well established in both rural and urban areas,<sup>16</sup> and surcharges to water charges to cover storm water and sewage reticulation and disposal costs are being phased in. Other urban services' O&M costs appear to be adequately met from property rate charges, while the growth in residential, commercial, and industrial development in the project area is providing a rapidly expanding base for such income from rates.

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<sup>16</sup> Although in some poorer rural areas, IAs do not apply charges which they are entitled to do (e.g. from Nanyin reservoir in Heilongjiang province)

## E. Environmental, Sociocultural, and Other Impacts

44. Whereas at appraisal it was anticipated that some Category A subprojects might be implemented and needed an EIA prepared and approved by ADB prior to their implementation, no such subprojects were finally identified for inclusion in the Project. During the June 1999 review mission, the environmental classification of some roads and bridges subprojects in IMAR was changed from A to B after detailed inspections by the mission's environmental specialist. One subproject, Nanyin reservoir, concerned ADB review missions as to the potential environmental effects associated with expanding the reservoir. However, due to a lack of counterpart funding, this subproject was reduced in scope and the reservoir was not expanded. The environmental impacts of most of the subprojects were relatively minor and related to those arising during project construction. In accordance with the construction standards issued by the Ministry of Construction, appropriate mitigation measures were identified and included in the EIA report of the subprojects, which were scrutinized by the environment protection bureau of the region/province prior to their submission for ADB approval. The environment protection bureaus also closely supervised the implementation of the mitigation measures to ensure that they had been undertaken satisfactorily during the implementation period.

45. With respect to poverty reduction, the project area includes poverty counties/*banners*,<sup>17</sup> populated by ethnic minorities.<sup>18</sup> The Project provided immediate short-term relief in the form of provision of supplementary incomes to unskilled rural and urban workers, most of whom are from ethnic minorities, via 5 months per year construction contracts. Longer term, poverty reduction per se will largely only be achieved indirectly via the beneficial effect for all socioeconomic and vulnerable groups (including ethnic minorities) from enhanced economic prosperity brought about by rehabilitation and improvements to infrastructure, especially in the poverty counties/*banners* in the project area. In particular, the ethnic minorities living in the less developed and remote areas of the Project have benefited from the rehabilitated roads and highways through the provision of better access to opportunities for employment and education in urban centers. The extent that the Project enhanced the incomes of the rural poor directly via improved irrigation supplies was fairly limited.

46. Resettlement of residents was required for some roads and bridges sector subprojects, but the numbers requiring resettlement were small since most sections were along the original alignments. For example, for the 3 roads and bridges subprojects selected for BME, representing almost 20% of project costs, only 23 households required resettlement (Appendix 9, Table A9). In Heilongjiang province, 163 households had to be resettled for the roads and bridges sector subprojects, the most significant resettlement being for the Nianbei Highway subproject where 126 households had to be resettled. The EAs submitted to ADB detailed land acquisition and resettlement plans, when required, as part of the feasibility study reports, which were also approved by the local land administration bureaus. Compensation paid and the procedures followed were in accordance with the 1998 Land Administration Law, which requires the general public to be apprised of the plan, and for the local government to solicit comments and suggestions from the collectives and affected individuals. From the BME analysis

<sup>17</sup> Poverty counties and *banners* are defined either by the central government or by regional/provincial government, on the basis of average per capita income for the county or *banner* being below a threshold level—generally between CNY1,000 (\$121) to CNY1,500 (\$181) per capita per annum. It is estimated that around 7 million people in the project area live in poverty counties/*banners*.

<sup>18</sup> Based on available data in IMAR, the ethnic minorities is about 26% of the total population of 12.8 million, scattered in 5 prefectures in the project area. The ethnic minorities in the project area include Dawoer, Elunchun, Ewenke, Korean, Man, and Mongolian.

undertaken, the resettled households seem generally happy with their new circumstances. Their new houses are larger and of better quality than their previous dwellings, while land has been provided in the same villages as they previously lived in. In the case of urban facilities sector subprojects, there were some indirect resettlement effects as the upgrading of facilities, especially urban roads, frequently brought with it the redevelopment of adjacent property. While such urban renewal provides opportunities for entrepreneurial profits for developers, there was no evidence to suggest that residents resettled as a consequence of project works were treated unfairly, and indeed, the overwhelming impact of the Project on residents seems positive.

## **V. OVERALL ASSESSMENT AND RECOMMENDATIONS**

### **A. Overall Assessment**

47. The Project was implemented as conceived at appraisal. This included considerable flexibility in final subproject selection and formulation, subject to various selection criteria agreed between ADB and the Borrower. The Project has met its objective of assisting the Government of the PRC to restore normal levels of economic and social activity by rehabilitating flood-damaged infrastructure in IMAR as well as Heilongjiang and Jilin provinces.

48. The Project has been assessed following the *Guidelines for the Preparation of Project Performance Audit Reports* and is rated as highly successful, with shortcomings limited to some minor implementation delays and BME systems falling short of expectations.

### **B. Lessons Learned**

49. The absence of a project framework and lack of BME data, coupled with poor monitoring by counterpart staff, affects the monitoring of project performance.

50. The capability of, and availability of counterpart funds at, municipal government IAs in the PRC have proven to be sufficiently high for this large and complex multisector project to be implemented to a generally high standard. Despite the largely disaggregated implementation structures and initial unfamiliarity with ADB procedures and documentation, the various IAs and EAs were able to formulate, design, and implement a series of subprojects, which met their own priorities, but within the selection criteria agreed with ADB at appraisal. Adopting this sector loan approach appears to be well suited for emergency loans to the PRC.

51. Implementation experience suggests that the use of international project management specialist consultants who are familiar with ADB procedures for (i) subproject selection, (ii) eligibility of particular expenditures for loan financing, and (iii) procurement and disbursement will assist with the timely implementation and monitoring of major projects in the PRC, although the EAs and IAs involved with this Project have now gained this experience themselves. Also, emphasis should be placed on training EA and IA staff by consultants.

52. For timely completion of physical works, and the smooth processing of withdrawal applications and disbursements, strong coordination by the PMO is essential.

## **C. Recommendations**

### **1. Project-Related**

53. Because of the emergency situation, the loans for the Project were processed urgently, without a formal project framework to establish a baseline for monitoring. Although BME was provided for in the Project, the resources committed to it were insufficient. For future projects responding to emergency situations, sufficient funding should be allocated under the loan to BME activities to enable the monitoring of the short- and long-term impacts. It is recommended that the sample of 9 subprojects selected for M&E under the Project continue to be monitored by the EAs and IAs and that this work be integrated with an updating of the estimates of subproject benefits identified as part of the feasibility study reports.

54. During the project completion review, the headworks of the Dongsheng irrigation scheme were found to have fallen into disrepair. The IA committed to undertake remedial works, which were completed by 20 October 2003 as stated in their letter of 20 October 2003. The Government should ensure that adequate funds continue to be made available for O&M to ensure continued sustainability of the rehabilitated and improved infrastructure.

55. The operations of Yuming hydropower station need to be integrated with the operations of other water resources systems located upstream, including the Hong Shan reservoir to ensure continuity of electricity generation at a high load factor by the IA.

56. The preparation of a project performance audit report can begin as early as 2004.

### **2. General**

57. For emergency response projects, training on procurement, recruitment of consultants, and disbursements should be provided by ADB at the initial phase of project implementation to familiarize EAs and IAs with ADB procedures.

58. Provision for advanced action and retroactive financing needs to be made for all future emergency rehabilitation projects during appraisal by ADB.

59. ADB approval of a subproject for inclusion under an emergency loan should be based on a detailed design study prepared by the IA rather than on a feasibility study report. When infrastructure is to be rehabilitated anyway, it is more appropriate to focus on the best design alternatives rather than analyzing whether the rehabilitation should occur or not. However, where facilities are being expanded, some consideration of optimizing the extent of capacity growth should be addressed.

60. The PRC Government needs to ensure that all the required internal approvals for subprojects are advanced in parallel with approvals from ADB. Likewise, ADB should ensure that sufficient resources are available to ensure timely responses to reports submitted by the IAs.

## POVERTY COUNTIES/BANNERS IN THE PROJECT AREA

### A. Poverty Level Measures

1. Information gathered during the PCR Mission indicated current poverty level thresholds in the People's Republic of China (PRC) defined at the national government level of between CNY1,000 (\$122) for the "poor" and CNY1,500 (\$181) for the "near poor" per capita per annum. The percentages of population classified as "poor" in Inner Mongolia Autonomous Region (IMAR), Heilongjiang, and Jilin in February 2002 was 17.3%, 15.5%, and 10.1%, respectively. The percentages of population classified as "poor" or "near poor" (i.e., having average incomes less than CNY1,500 per capita per annum) for IMAR, Heilongjiang, and Jilin were 40.3%, 34.4%, and 27.0%.<sup>1</sup>

2. National poverty counties and *banners* are defined where average incomes fall below the "near poor" level.

3. In IMAR and Heilongjiang province additional provincial poverty counties or *banners* are defined where average incomes fall between CNY1,500 and CNY2,500 (\$301) per capita per annum.

### B. Poverty Counties and *Banners* in Inner Mongolia Autonomous Region

4. There are seven national poverty counties and *banners* in IMAR in the project area: the *banners* of Arong, Balinyou, Keyouzhong, Mulidawa, Wenniute, and Zhalaite, and Tuquan county. There are 4 additional provincial poverty *banners* in the project area: Dongwu, Keyouqian, Kouzuozhong, and Zhalute. The total population in these 11 counties and *banners* is estimated to be 2.6 million.<sup>2</sup>

### C. Poverty Counties in Heilongjiang

5. There are 5 national poverty counties and *banners* in Heilongjiang province in the project area: Baiquan, and the counties of Dumeng, Gannan, Lindian, and Tailai. There are 4 provincial poverty counties in the project area: Fuyu, Kedong, Longjiang, and Zhaoyuan. The total population in these 9 counties and *banners* is estimated to be 3.1 million.

### D. Poverty Counties in Jilin

6. There are 2 national poverty counties in Jilin in the project area: Daan and Zhenlai. Their combined population is estimated to be 1.2 million.

### E. Total Poverty Population in Project Area

7. Combining the poverty population in the project area in IMAR, Heilongjiang, and Jilin gives a total of 6.9 million.

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<sup>1</sup> Source: Songhua River Flood Plain Management Sector Project TA 3376-PRC. Volume 8. February 2002. (See format of footnote 13 on appendix 9)

<sup>2</sup> Source: PMO

## LIST OF SUBPROJECTS

**Loan No. 1685-PRC: Northeast Flood Damage Rehabilitation Project  
Inner Mongolia Autonomous Region**

Component			Actual ('000)	
			Subproject Cost	
Output			CNY	\$
A. Roads and Highways				
1.	NH 111 Wulanhaote to Xinlinbei	165.5 km classification 2, with subgrade 12 m wide, 7 m sealed	380,700	45,978
2.	PH 101 Aershan to Huolinguole	365.7 km, classification 3, with subgrade 8.5 m wide, 7 m sealed	358,110	43,250
3.	NH 111 Xinlinbei to Zhalantun	85.1 km, classification 2, 12 m subgrade, 7 m sealed	251,900	30,423
4.	NH 111 Najitun to Nierji	114 km, classification 3, subgrade 8.5 m, 7 m sealed	221,220	26,717
5.	NH 304 Shebetu to Huolinguole	280.6 km, classification 2, subgrade 12 m wide, 9 m (112 km) to 7 m (168.6 km)	450,390	50,395
Subtotal			1,662,320	196,763
1.	Hairisu Irrigation Scheme	12 km embankment in 5 sections, 76 division gates, 3 water drops	38,480	4,647
2.	Yuming Hydropower Station	Small-scale hydropower station, total storage capacity of 1.68 million m <sup>3</sup> , installation capacity 1,500 kW, buildings including power houses, discharging tunnel, overflowing dam and transformer station	17,064	2,061
3.	Daxing Shengli Headworks	1 headworks, including rubber dam, sluice gate and intake gates	4,460	539
4.	Dongsheng Irrigation Scheme	Headworks, main canal of 1 km, 2 branch canals about 18 and 10 km long; 15 structures of trunk and branch canals;105 structures of lateral canals; 18 km of drains and 66.5 km of lateral ditches;100 wells; 2,500 enclosed pasture areas; 840 ha spray irrigation;130 ha drip irrigation and 350 ha furrow irrigation	26,356	3,183
5.	Chaersen Irrigation Scheme	2 irrigation schemes, 2 headworks, 9.88 km irrigation channels, 43 structures including diversion gates, intake gates, road bridges, and aqueducts	30,000	3,623
6.	Hangali Reservoir	Total storage capacity of 92.5 million m <sup>3</sup> , irrigation area of 155,000 mu farmlands and 41,000 mu pastures	15,890	1,919

			Actual ('000)	
Component			Subproject Cost	
Output			CNY	\$
7.	Qianjin Irrigation Scheme	Medium-sized irrigation scheme including 3 sub-areas, 4 intake gates, 4 sluice gates and 4 dams, 4 trunk canals, 24 branch canals and annex structures	20,360	2,459
8.	Duximiao Irrigation Scheme	Medium-sized irrigation scheme; 1,000 wells; 25 trunk-canal gates; 6 crossing culverts; 23 branch-canal bridges; 2 junction works; 585 km channels; 27 trunk-canal bridges and 72 branch-canal gates	51,461	6,215
9.	Chaersen Irrigation Scheme	2 intake junction works, diversion gates, intake gates, road bridges, diversion dike	20,670	2,496
10.	Tumuji Reservoir	Medium-sized reservoir with storage capacity of 99 million m <sup>3</sup> ; works of heightening the main dam; 2,600 m high; rebuilding the spillway dam 400 m long; reinforcing rock-lined auxiliary dam of 4,200 m long; restoring 6 discharge outlets	8,420	1,017
<b>Subtotal</b>			<b>233,161</b>	<b>28,159</b>
<b>C. Urban Facilities</b>				
1.	Zhalantun Bridge	A new prestressed T-beam bridge 326 m long overall, deck width 16 m <sup>8</sup> spans, approach 678 m designed load 20 t trailer—120 t	25,036	3,024
2.	Zhalantun Roads	Reconstruction of 13 urban roads (area 141,836 m <sup>2</sup> ) including drainage, paving, and lights	25,698	3,104
3.	Zhalantun Water Supply	Reconstruction of 5 water supply wells, water treatment plant, transformer, generating set, control and distribution system, 18.9 km pipelines and restoration of vegetation	19,401	2,343
4.	Najitun Bridge and Roads	2 plate girder bridges; 20 m long and 21.6 m wide; 2 spans; 3 urban roads 6,408 m long with the area of 96,022 m <sup>2</sup> and drainage	23,040	2,783
5.	Nierji Bridge and Roads	Three 23 m long bridges with the respective width of 12, 16 and 23 m; urban roads of 38,640 m <sup>2</sup> inclusive of drainage and lights	16,085	1,943
6.	Aershan Roads	Motor vehicle lanes of 36,454 m <sup>2</sup> ; nonmotor vehicle lanes of 19,062 m <sup>2</sup> , sidewalk of 15,938 m <sup>2</sup> ; drainage of 5,021 m, lights and other facilities	11,440	1,382
7.	Aershan Water Supply	Reconstruction of water supply plant and resource, pipelines, dam, and power distribution facilities	17,586	2,124
8.	Bayanhushuo Bridge and Roads	6 urban roads of 8,100 m long and 14 m wide; bitumen pavement; drainage and lights; 3 reinforced concrete bridges	22,640	2,734



			Actual ('000)	
Component			Subproject Cost	
Output			CNY	\$
9.	Wulanhaote Water Supply	Rock-lined flood-control bank of 1,515 m; 3 wells; 3 pump houses; water treatment plant; power supply and distribution facilities; pipelines	18,420	2,225
10.	Yinder Roads	Urban roads of 2,600 m long and 40 m wide and 5,200 m drainage and lights	12,515	1,511
11.	Huolinguole Bridge	Bridge with the length of 100 m and width of 9 m	4,055	490
12.	Huolinguole Roads	2 urban roads of 9 m wide with the respective 948 m and 1,400 m total area of 21,100 m <sup>2</sup>	5,650	682
13.	Huolinguole Water Supply	45.45 km water distribution pipelines, 11 deep wells, water resource and treatment plants	34,726	4,194
14.	Tongliao Roads	3 urban roads with total length of 9,560 m and area of 200,000 m <sup>2</sup> ; 19,540 m drainage, 9,600 m sewage lines; 2,400 m water supply pipelines, lights	62,566	7,556
15.	Lubei Roads	5 urban roads of 98,460 m <sup>2</sup> and 8,762 m drainage	17,206	2,078
16.	Wulanhaote Roads	2 urban roads with total length of 3,842 m; motor vehicle lanes of 61,477 m <sup>2</sup> ; sidewalk of 21,545 m <sup>2</sup> ; drainage of 6,598 m	17,770	2,146
17.	Bayanhushuo Roads	3 urban roads with total length of 7,000 m and drainage and lights	12,800	1,546
18.	Tuquan Roads	3 bitumen pavement roads with the total length of 5,965 m and area of 76,415 m <sup>2</sup> ; 2 concrete pavement roads with total length of 4,436 m and area of 48,360 m <sup>2</sup> , lights and drainage	23,640	2,855
19.	Yinder Drainage and Roads	Motor vehicle lanes of 59,495 m <sup>2</sup> ; nonmotor vehicle lanes of 34,005 m <sup>2</sup> ; sidewalk of 27,500 m <sup>2</sup> ; lights and drainage of 8,450 m with rock-lined slope protection	36,400	4,396
20.	Aershan Roads	Motor vehicle lanes of 60,814 m <sup>2</sup> , sidewalk of 26,400 m <sup>2</sup> ; 7,120 m drainage and lights	16,429	1,984
Subtotal			423,103	51,100
Total			2,318,584	276,022

ha = hectare, km = kilometer, m<sup>2</sup> = square meter, m<sup>3</sup> = cubic meter, NH = national highway, t = ton.

Source: ADB and Borrower's PCR.

**Loan No. 1686-PRC: Northeast Flood Damage Rehabilitation Project  
Heilongjiang Province**

Component		Output	Actual ('000)	
			Subproject Cost	
			CNY	\$
A. Roads and Bridges				
Nianbei Highway				
1.	Fengtun–Longan Bridge	19.14 km	192,128	23,148
2.	Longan Bridge–Kedong	84.29 km	303,370	36,550
3.	Nianzishan–Fulaerji	73.26 km	275,411	33,182
Subtotal			770,909	92,881
Qigan Highway				
4.	Meilisi–Gannan Highway	73.06 km	352,201	42,433
Linzhao Highway				
5.	Lintai Highway	53.07 km	157,744	19,005
6.	Xinzhao Highway	65.71 km	260,533	31,390
Subtotal			418,277	50,395
Total - Roads and Highways			1,541,388	185,710
B. Urban Infrastructure				
Harbin Pump Stations				
1.	Repair of five damaged pump stations (Gao Yi, Jing Jie, Sun Island, SGB, and Xin Zheng Yang)	5 pump stations rehabilitated, comprising civil works and equipment procurement	66,158	7,971
C. Water Resources				
Nanyin Reservoir				
2.	Rehabilitation of channels, sluice and pump station, dam and revetments	Restoration of the irrigation area of 345,000 mu (23,000 ha) by implementing dike rehabilitation, irrigation structure reconstruction	176,389	21,252
Grand Total			1,783,935	214,933

ha = hectare, km = kilometer.

Source: ADB and Borrower's PCR.

**Loan No. 1687-PRC: Northeast Flood Damage Rehabilitation Project  
Jilin Province**

Component/Subprojects		Output	Actual ('000)	
			Subproject Cost CNY	\$
A. Roads and Bridges				
1.	Baiching–Gashigen Highway (Roadway, Bridges, and Culverts) Feeder Roads	126 km	434,579	28,381
2.	(Roadway, Bridges and Culverts) Changshan and Daobao Bridges	221.41 km	482,918	57,658
3.	(Two bridges and approaches)	2 km	78,700	4,413
4.	Class III Roads (Pavement and Structures)	Upgrade the subgrade, pavement and structure of 15 highways section; total length is 234 km	114,062	14,531
Subtotal			1,110,259	104,983
B. Urban Facilities				
1.	Daan (roads, water supply, storm drainage, sanitary sewer, lights, landscape)	Rehabilitation of 186,880 m <sup>2</sup> urban road; adding sidewalk; street lights, and landscaping; 30 km water supply pipeline; sewer and storm water pipeline	75,003	8,964
2.	Taonan (road, storm drainage, sanitary sewer, lights, landscape)	Rehabilitation of 394,070 m <sup>2</sup> urban road, adding sidewalk, street lights, and landscaping; total length of 32 km water supply pipeline, sewer and storm water pipeline, and trafficking safety facilities	186,000	22,388
3.	Baiching (road, water sewer, storm drainage, sanitary sewer, lights, landscape)	Rehabilitation of 150,164 m <sup>2</sup> urban road, adding sidewalk, street lights, and landscaping; total 24 km water supply pipeline, sewerage and storm water pipeline; sewerage pump station (619 m <sup>2</sup> ) and equipment supply for the pump station	64,069	7,703
4.	Songyuan (road, storm drainage, sanitary sewer, pump station, lights, landscape)	Rehabilitation of 293,037 m <sup>2</sup> urban road, adding sidewalk, street lights, and landscaping; total length of 23 km sewer pipeline and 2 sewer pump stations (555,000 m <sup>3</sup> ); 19 km storm water pipeline rehabilitation	175,000	7,703
5.	Zhenlai (water sewer, roads)	One water treatment and supply plant comprising of 7 deep wells and pump/equipment procurement, 32.59 km water supply pipeline and network; 4.4 km urban road rehabilitation, adding the curb stones, drainage, and street lights	37,180	21,146

		Actual ('000)	
		Subproject Cost	
Component/Subprojects	Output	CNY	\$
6. Liaoyuan (road, water sewer, storm drainage, sanitary sewer, light, landscape)	Rehabilitation of 420,557 m <sup>2</sup> urban road, adding sidewalk, street lights, and landscaping; total length of 9.6 km sewerage pipeline and 3.1 km water supply pipeline rehabilitation; reconstruction of two urban bridges (120 m <sup>2</sup> )	93,190	11,206
<b>Subtotal</b>		<b>630,442</b>	<b>67,904</b>
<b>Total</b>		<b>1,740,701</b>	<b>172,887</b>

ha = hectare, km = kilometer, m<sup>2</sup> = square meter, m<sup>3</sup> = cubic meter.

Source:

**PROJECT COSTS**  
(Amount in \$ Million)

Component	Eligible Costs									Ineligible Costs			Total Project Costs (Eligible + Ineligible)		
	ADB Financed			Gov't. Financed			Total Eligible Costs			Gov't. Financed					
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total	Foreign	Local	Total
L1685-Inner Mongolia															
A. Water Resources	7.99	3.00	10.99	0.00	18.00	18.00	7.99	21.00	28.99	0.00	0.00	0.00	7.99	21.00	28.99
B. Urban Facilities	16.35	14.27	30.62	0.00	21.17	21.17	16.35	35.44	51.79	0.00	0.00	0.00	16.35	35.44	51.79
C. Roads and Bridges	32.00	28.00	60.00	0.00	116.58	116.58	32.00	144.58	176.58	9.81	27.92	37.73	41.81	172.50	214.31
D. Project Management	0.19	0.17	0.36	0.00	0.24	0.24	0.19	0.41	0.60	0.00	0.00	0.00	0.19	0.41	0.60
Tax Paid	0.00	0.00	0.00	0.00	8.00	8.00	0.00	8.00	8.00	0.00	0.00	0.00	0.00	8.00	8.00
Subtotal	56.53	45.44	101.97	0.00	163.99	163.99	56.53	209.43	265.96	9.81	27.92	37.73	66.34	237.35	303.69
Interest During Construction	8.03	0.00	8.03	0.00	0.00	0.00	8.03	0.00	8.03	0.00	0.00	0.00	8.03	0.00	8.03
Total	64.56	45.44	110.00	0.00	163.99	163.99	64.56	209.43	273.99	9.81	27.92	37.73	74.37	237.35	311.72
L1686-Heilongjiang Province															
A. Water Resources	5.89	4.00	9.89	0.00	11.00	11.00	5.89	15.00	20.89	0.00	0.00	0.00	5.89	15.00	20.89
B. Urban Facilities	4.00	4.00	8.00	0.00	2.00	2.00	4.00	6.00	10.00	0.00	0.00	0.00	4.00	6.00	10.00
C. Roads and Bridges	44.00	39.60	83.60	0.00	70.40	70.40	44.00	110.00	154.00	13.00	37.00	50.00	57.00	147.00	204.00
D. Project Management	0.29	0.17	0.46	0.00	0.14	0.14	0.29	0.31	0.60	0.00	0.00	0.00	0.29	0.31	0.60
Tax Paid	0.00	0.00	0.00	0.00	6.23	6.23	0.00	6.23	6.23	0.00	0.00	0.00	0.00	6.00	6.00
Subtotal	54.18	47.77	101.95	0.00	89.77	89.77	54.18	137.54	191.72	13.00	37.00	50.00	67.18	174.31	241.49
Interest During Construction	8.05	0.00	8.05	0.00	0.00	0.00	8.05	0.00	8.05	0.00	0.00	0.00	8.05	0.00	8.05
Total	62.23	47.77	110.00	0.00	89.77	89.77	62.23	137.54	199.77	13.00	37.00	50.00	75.23	174.31	249.54
L1687-Jilin Province															
A. Water Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Urban Facilities	24.00	22.85	46.85	0.00	30.88	30.88	24.00	53.73	77.73	0.00	0.00	0.00	24.00	53.73	77.73
C. Roads and Bridges	29.00	26.00	55.00	0.00	68.95	68.95	29.00	94.95	123.95	6.76	19.00	25.65	35.76	113.95	149.71
D. Project Management	0.19	0.01	0.20	0.00	0.41	0.41	0.19	0.42	0.61	0.00	0.00	0.00	0.19	0.42	0.61
Tax Paid	0.00	0.00	0.00	0.00	6.17	6.17	0.00	6.17	6.17	0.00	0.00	0.00	0.00	6.17	6.17
Subtotal	53.19	48.86	102.05	0.00	106.41	106.41	53.19	155.27	208.46	6.76	19.00	25.65	59.95	174.27	234.22
Interest During Construction	7.95	0.00	7.95	0.00	0.00	0.00	7.95	0.00	7.95	0.00	0.00	0.00	7.95	0.00	7.95
Total	61.14	48.86	110.00	0.00	106.41	106.41	61.14	155.27	216.41	6.76	19.00	25.65	67.90	174.27	242.17
Summary:															
A. Water Resources	13.88	7.00	20.88	0.00	29.00	29.00	13.88	36.00	49.88	0.00	0.00	0.00	13.88	36.00	49.88
B. Urban Facilities	44.35	41.12	85.47	0.00	54.05	54.05	44.35	95.17	139.52	0.00	0.00	0.00	44.35	95.17	139.52
C. Roads and Bridges	105.00	93.60	198.60	0.00	255.93	255.93	105.00	349.53	454.53	29.57	83.92	113.38	134.57	433.45	568.02
D. Project Management	0.67	0.35	1.02	0.00	0.79	0.79	0.67	1.14	1.81	0.00	0.00	0.00	0.67	1.14	1.81
Tax Paid	0.00	0.00	0.00	0.00	20.40	20.40	0.00	20.40	20.40	0.00	0.00	0.00	0.00	20.40	20.40
Subtotal	163.90	142.07	305.97	0.00	360.17	360.17	163.90	502.24	666.14	29.57	83.92	113.38	193.47	586.17	779.64
Interest During Construction	24.03	0.00	24.03	0.00	0.00	0.00	24.03	0.00	24.03	0.00	0.00	0.00	24.03	0.00	24.03
Total	187.93	142.07	330.00	0.00	360.17	360.17	187.93	502.24	690.17	29.57	83.92	113.38	217.50	586.17	803.67

## ANNUAL DISBURSEMENTS

**L1685: Inner Mongolia Autonomous Region**

Category	Item of Expenditure	1999	2000	2001	2002	2003	Total
01A	Civil Works & Materials (Roads & Bridges)	7,056,647	4,748,192	30,637,561	13,657,949	4,307,118	60,407,467
01B	Civil Works & Materials (Non-Road Sectors)	4,177,378	15,553,237	8,466,543	8,476,813	4,070,902	40,744,873
02	Equipment (Non-Road Sectors)	-	335,013	46,617	-	-	381,630
03	Consulting Services	140,813	81,825	-	93,914	124,276	440,828
04	Interest During Construction	40,219	1,075,654	2,938,354	3,970,773	-	8,025,000
05	Unallocated	-	-	-	-	-	-
99	Imprest Fund	-	-	5,714	-	(5,714)	-
Total		11,415,057	21,793,921	42,094,789	26,199,449	8,496,582	109,999,798

**L1686: Heilongjiang Province**

Category	Item of Expenditure	1999	2000	2001	2002	2003	Total
01A	Civil Works & Materials (Roads & Bridges)	15,954,402	19,657,872	35,857,081	11,768,201	230,520	83,468,076
01B	Civil Works & Materials (Non-Road Sectors)	1,460,831	-	11,512,879	746,903	1,094,760	14,815,373
02	Equipment (Non-Road Sectors)	484,815	-	2,280,834	464,910	-	3,230,559
03	Consulting Services	178,762	-	169,490	41,313	46,316	435,881
04	Interest During Construction	40,219	1,609,781	3,449,355	2,950,645	-	8,050,000
05	Unallocated	-	-	-	-	-	-
99	Imprest Fund	-	-	-	-	-	-
Total		18,119,029	21,267,653	53,269,639	15,971,972	1,371,596	109,999,889

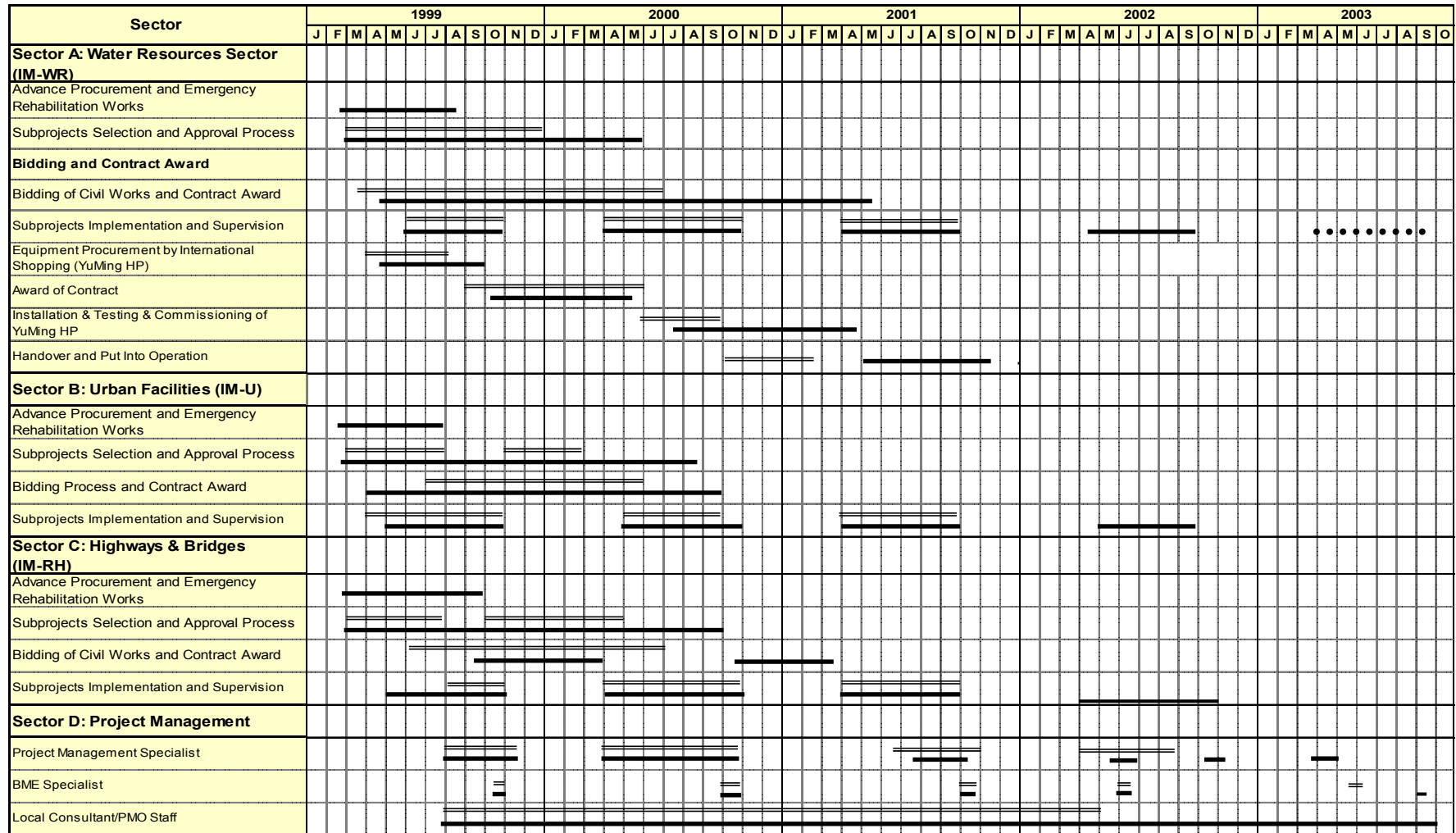
**L1687: Jilin**

Category	Item of Expenditure	1999	2000	2001	2002	2003	Total
01A	Civil Works & Materials (Roads & Bridges)	-	-	49,955,764	5,412,803	-	55,368,567
01B	Civil Works & Materials (Non-Road Sectors)	3,249,712	12,006,941	19,708,454	10,306,236	-	45,271,343
02	Equipment (Non-Road Sectors)	-	-	-	446,482	487,653	934,135
03	Consulting Services	62,448	258,630	88,981	65,896	-	475,955
04	Interest During Construction	40,219	525,785	2,375,558	5,008,438	-	7,950,000
05	Unallocated	-	-	-	-	-	-
99	Imprest Fund	-	-	-	-	-	-
Total		3,352,379	12,791,356	72,128,757	21,239,855	487,653	110,000,000

**SUMMARY OF YEARLY DISBURSEMENTS L1685/L1686/L1687**

Category	Item of Expenditure	1999	2000	2001	2002	2003	Total
01A	Civil Works & Materials (Roads & Bridges)	23,011,049	24,406,064	116,450,406	30,838,953	4,537,638	199,244,110
01B	Civil Works & Materials (Non-Road Sectors)	8,887,921	27,560,178	39,687,876	19,529,952	5,165,662	100,831,589
02	Equipment (Non-Road Sectors)	484,815	335,013	2,327,451	911,392	487,653	4,546,324
03	Consulting Services	382,023	340,455	258,471	201,123	170,592	1,352,664
04	Interest During Construction	120,657	3,211,220	8,763,267	11,929,856	-	24,025,000
05	Unallocated	-	-	-	-	-	-
99	Imprest Fund	-	-	5,714	-	(5,714)	-
Total		32,886,465	55,852,930	167,493,185	63,411,276	10,355,831	329,999,687

# IMPLEMENTATION SCHEDULE (Loan No.1685-PRC Inner Mongolia Autonomous Region)



Legend : Planned Actual Extension of Civil Works (Government Financing)

Source:  
The original planned schedule as given in project progress report.  
The actual schedule as presented in project completion report.

HP= hydropower, BME = benefit monitoring and evaluation, PMO = project management office





**IMPLEMENTATION SCHEDULE (Loan No.1687-PRC JiLin Province )**

[illegible]

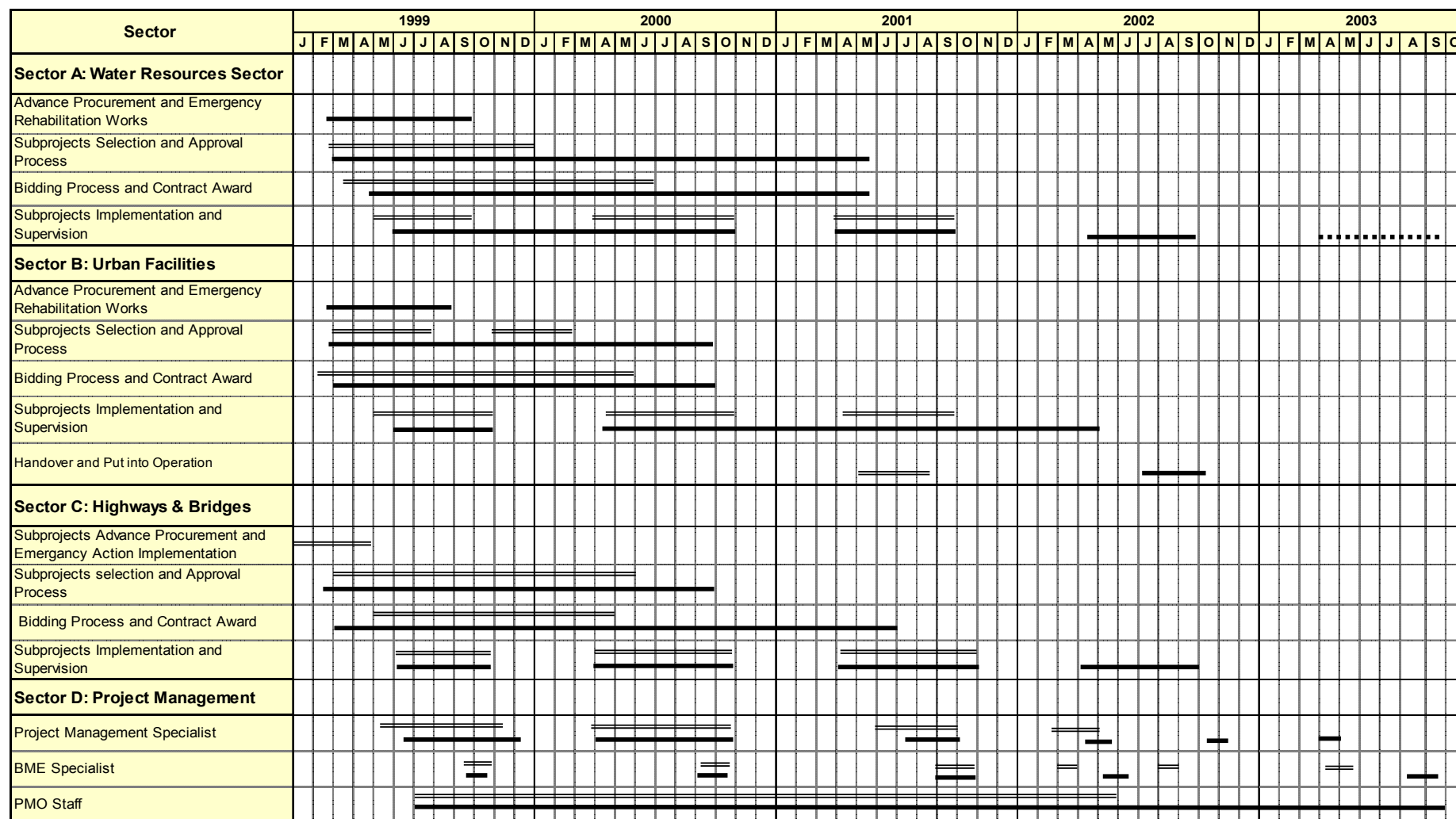
**Legend :**     Planned     Actual

Source:

The original planned schedule as given in Project Progress Report

The Actual schedule as presented in Project Completion Report

# OVERALL PROJECT IMPLEMENTATION SCHEDULE (Loans 1685/1686/1687-PRC)



Legend :  Planned  Actual  Extension of Civil Works (Government Financing)

Source:

The original planned schedule as given in project progress report.

The actual schedule as presented in project completion report.

BME= benefit monitoring and evaluation, PMO= project management office

**STATUS OF COMPLIANCE WITH LOAN COVENANTS**  
(as of September 2003)

Covenants	Reference in the Loan Agreement	Status of Compliance
The Borrower shall relend the proceeds of the loan to the region under a subsidiary loan agreement (SLA) upon terms and conditions satisfactory to the Asian Development Bank (ADB). The terms for relending the proceeds of the loan shall include (i) interest at the same rate as that of the loan; (ii) a repayment period including a grace period identical to that of the loan; and (iii) the region bearing the foreign exchange and interest variation risks.	Article III, Sec. 3.01(a)	Complied with. Loan Agreement signed on 19 May 2003 for Inner Mongolia Autonomous Region (IMAR), and Heilongjiang and Jilin provinces.
The Borrower shall cause the region to onlend the proceeds of the loan to the implementing agencies (IAs) pursuant to the onlending agreements satisfactory to ADB. The terms for relending the proceeds of the loan shall include (i) interest at the same rate as that under the SLA; (ii) a repayment period including a grace period identical to that of the loan; and (iii) the IAs bearing the foreign exchange and interest variation risks.	Article III, Sec. 3.01(b)	Complied with. Onlending agreements were submitted to ADB.  IMAR and Heilongjiang province: 19 November 1999, and Jilin province: 25 November 1999
The Borrower shall cause the region and the IAs to apply the proceeds of the loan to the financing of expenditures on the Project in accordance with the provisions of the Loan Agreement.	Article III, Sec. 3.01(c)	Complied with.
The Borrower shall cause the region to apply the proceeds of the loan to the financing of expenditures on the Project in accordance with the provisions of the Loan Agreement.	Article III, Sec. 3.02(a)	Complied with.
Amounts of the loan may be withdrawn from the loan accounts only for the purpose of financing (i) eligible expenditures under Parts A through D of the Project; and (ii) the interest and commitment charge on the loan during the implementation period of the Project.	Article III, Sec. 3.02(b)	Complied with.
All subprojects to be financed under the loan shall meet the set criteria and follow the approval procedure specified in the Loan Agreement.	Article III, Sec. 3.02(c)	Complied with.
If the amount of the loan allocated to	Article III, Sec. 3.03	Complied with.

Covenants	Reference in the Loan Agreement	Status of Compliance
any part of the Project or any approved subproject appears at any time to exceed all agreed expenditures for that part of the Project or that subproject, ADB may, at the request of the Borrower, reallocate such excess amount to any part of the Project or subproject, as required.		
The arrangements for withdrawal of the proceeds of the loan to finance the goods, services and other items of expenditure of the Project shall be in accordance with the provisions of the Loan Agreement, and may be amended from time to time by agreement between the Borrower and ADB.	Article III, Sec. 3.04	Complied with.
All goods and services to be financed out of the proceeds of the loan shall be procured in accordance with the provisions of the Loan Agreement. The ADB may refuse to finance a contract where goods or services have not been procured under procedures substantially in accordance with those agreed between the Borrower and ADB where the terms and conditions of the contract are not satisfactory to ADB.	Article III, Sec. 3.05	Complied with.
The Borrower shall cause all goods and services financed out of the proceeds of the loan to be used exclusively in carrying out the Project.	Article III, Sec. 3.06	Complied with.
The closing date for withdrawals from the loan account shall be 30 April 2002 or such other date as may from time to time agreed between the Borrower and ADB.	Article III, Sec. 3.07	IMAR: Loan account closed on 28 November 2003. . Heilongjiang province: Loan account actually closed on 30 July 2003. Jilin province: Loan account actually closed on 21 February 2003.
The Borrower shall cause the Project to be carried out with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, flood protection, drainage, road and bridge construction, water supply and water resources management, and public utility practices.	Article IV, Sec. 4.01(a)	Complied with.
The Borrower shall provide promptly as needed, the funds, facilities, services, land and other resources which are required, in addition to the proceeds of the loan, for carrying out	Article IV, Sec. 4.02	Complied with.

Covenants	Reference in the Loan Agreement	Status of Compliance
the Project and for the operation and maintenance of the Project facilities.		
The Borrower shall cause competent and qualified consultants and contractors, acceptable to the Borrower and ADB, to be employed to an extent and upon terms and conditions satisfactory to the Borrower and ADB.	Article IV, Sec. 4.03(a)	Complied with. Qualified consultants were recruited in accordance with ADB's guidelines. Contractors who carried out emergency reconstruction were competent.
The Borrower shall cause the Project to be carried out in accordance with plans, designs, standards, specifications, work schedules and construction methods acceptable to the Borrower and ADB. The Borrower shall furnish to ADB, promptly after preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB shall reasonably request.	Article IV, Sec. 4.03(b)	Complied with. Plans, design, standards, specifications, works schedules, and construction methods were contained in the feasibility study reports (FSRs) for the subproject, which were approved by the Borrower and ADB.
The Borrower shall ensure that the activities of its departments and agencies with respect to carrying out of the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	Article IV, Sec. 4.04	Complied with. Project management specialists (PMS) were recruited for each of the 2 provinces and region for the purpose of assisting the EAs in project implementation administration and management.
The Borrower shall make arrangements satisfactory to ADB for insurance of the Project facilities to such extent and against risks and in such amounts as shall be considered with sound practice.	Article IV, Sec. 4.05(a)	Complied with.
The Borrower undertakes to insure the goods to be imported for the Project and to be financed out of the proceeds of the loan against hazards incident to the acquisition, transportation and delivery thereof to the place of use or installation, and for such insurance, any indemnity shall be payable in a currency freely usable to replace or repair such goods.	Article IV, Sec. 4.05(b)	Complied with.
The Borrower shall maintain records and accounts adequate to identify the goods, 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	Article IV, Sec. 4.06(a)	Complied with. Records and accounts were adequately maintained by each EA.

Covenants	Reference in the Loan Agreement	Status of Compliance
the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, the operations and financial condition of the agencies of the Borrower responsible for carrying out the Project and operation of the Project facilities, or any part thereof.		
<p>The Borrower shall (i) maintain separate accounts for the Project; (ii) have such accounts and related financial statements audited annually; (iii) furnish to ADB not later than 12 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the loan proceeds and compliance with the covenants of the Loan Agreement as well as on the use of the procedures for the imprest account and statements of expenditures issued for the Project) all in English language; and (iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.</p>	Article IV, Sec. 4.06(b)	<p>Complied with. Audited financial statements due every 31 December were submitted:  <b>FY 1999</b>  IMAR: 2 Jan 2001  Heilongjiang province: 18 Jan 2001  Jilin province: 2 Jan 2001</p> <p><b>FY 2000</b>  IMAR: 20 Dec 2001  Heilongjiang province: 2 Jan 2002  Jilin province: 20 Dec 2001</p> <p><b>FY 2001</b>  IMAR: 24 Dec 2002  Heilongjiang province: 24 Jan 2003  Jilin province: 2 Jan 2003</p> <p>The three implementing agencies were reminded by the PCR Mission to submit the audited financial statement for FY 2003 on or before the due date of 31 Dec 2003.</p>
<p>The Borrower shall furnish to ADB all such reports and information as ADB shall reasonably request concerning the (i) loan, and the expenditure of the proceeds and maintenance of the service thereof; (ii) goods, services and other items of expenditure financed out of the proceeds of the loan; (ii) Project and the subprojects; (iv) administration, operations and financial condition of the agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof; (v) financial and economic conditions in the territory of the Borrower and the international balance-of-payments position of the Borrower' and (vi) other matters relating to the purposes of the loan.</p>	Article 4.07(a)	Complied with.
<p>The Borrower shall furnish to ADB quarterly reports on carrying out the Project and on the operation and management of the Project facilities, which will indicate progress made and problems encountered during the</p>	Article IV, Sec. 4.07(b)	Complied with. The quarterly progress reports were regularly submitted to ADB by the three implementing agencies (IMAR, Heilongjiang and Jilin provinces).

Covenants	Reference in the Loan Agreement	Status of Compliance
period under review, steps taken to remedy the problems, proposed program of activities and expected progress during the following period.		
Promptly after physical completion of the Project, but in any event not later than 6 months thereafter, the Borrower shall prepare and furnish to ADB a report on the execution and initial operation of the Project including its cost, the performance of the Borrower of its obligations and the accomplishment of the purposes of the loan.	Article IV, Sec. 4.07(c)	Complied with. The project completion reports were submitted: IMAR: 17 July 2003 Heilongjiang province: 16 Dec 2002 Jilin province: 22 Jan 2002
The Borrower shall enable ADB's representatives to inspect the Project, the goods financed out of the proceeds of the loan, and any relevant records and documents.	Article IV, Sec. 4.08	Complied with.
The Borrower shall ensure that the Project facilities are operated, maintained, and repaired in accordance with sound administrative, financial, engineering, environmental, flood protection, drainage, roads, bridges, water supply and water resources management, public utility, and maintenance and operational practices.	Article IV, Sec. 4.09	Complied with.
The following are specified as additional conditions to the effectiveness of the Loan Agreement: (a) the Loan Agreement shall have been approved by the State Council of the Borrower; and (b) the SLA shall have been duly executed and delivered on behalf of the Borrower and the province or region and shall have become fully effective and binding, subject only to the effectiveness of the Loan Agreement.	Article VI, Sec. 6.01	Complied with. Loan Agreement signed on 19 May 1999. While the SLA have been duly executed. IMAR and Heilongjiang province: 14 Dec 1999 Jilin province: 25 Nov 1999
The subsidiary loan agreement, in form and substance satisfactory to ADB, has been duly executed and delivered on behalf of the Borrower and the province or region and will become fully effective and binding subject only to the effectiveness of the Loan Agreement.	Article VI, Sec. 6.02	Complied with.
Procurement of goods and services shall be subject to the provisions of the <i>Guidelines for Procurement</i>	Schedule 3, para 2	Complied with. Procurement of goods and services were carried out through international shopping, international

Covenants	Reference in the Loan Agreement	Status of Compliance
revised February 1999, as amended from time to time, which have been furnished to the province or region.		competitive bidding, and direct purchase in accordance with ADB's <i>Guidelines for Procurement</i> .
The Borrower shall ensure that all ADB-financed goods and services procured are designed to be Y2K compliant.	Schedule 3, para 10(b)	Complied with.
The Borrower shall establish immediately after the effective date, an imprest account for the province or region at a commercial bank acceptable to the Borrower and ADB.	Schedule 3, para 16	Complied with. The imprest accounts were established.  IMAR and Heilongjiang province: 23 Nov 1999: Jilin province: 18 Nov 1999
Withdrawals from the loan account may be made for reimbursement of eligible expenditures incurred under the Project before the effective date, but not earlier than 12 February 1999, subject to a maximum amount of \$11,000,000 equivalent, provided, however, that the expenditures have been certified, and the necessary supporting documents submitted to ADB, by the province or region and by the concerned consultant and such certifications and documents are acceptable to ADB.	Section 3, para 17	Complied with. The initial reimbursement for eligible expenditures were made on: IMAR: 9 Dec 1999 Heilongjiang province: 27 Aug 1999 Jilin province: 27 Aug 1999.
No withdrawals shall be made from the loan account for any eligible expenditures under Part A, Part B, or Part C of the Project unless (i) the relevant onlending agreement shall have been duly executed and delivered on behalf of the province or region and the IA, and shall have become fully effective and legally binding; and (ii) evidence thereof by a legal opinion satisfactory to ADB, from the Borrower's counsel, acceptable to ADB, shall have been furnished to ADB.	Section 3, para 18	Complied with. See compliance with loan covenants on onlending agreement (Sec 3, para 17; Article VI Sec 6.01, and Article III, Sec 3,01 [6]).
The selection, engagement, and services of the consultants shall be subject to the provisions of Schedule 4 of the Loan Agreement and the provisions of the <i>Guidelines on the Use of Consultants</i> dated October 1998, as amended from time to time.	Schedule 4, para 2	Complied with.
Domestic consultants financed by the province and the region shall be selected and engaged in accordance with procedures acceptable to ADB,	Article 4, para 6	Complied with.



Covenants	Reference in the Loan Agreement	Status of Compliance
and their selection and engagement shall be subject to the concurrence of ADB with regard to their competence and experience for carrying out the assignment.		
Only subprojects that meet the criteria set in the Loan Agreement shall be accepted into the Project for ADB financing.	Schedule. 5, para 8	Complied with.
Subprojects not requiring prior ADB approval shall be subject to ADB approval on an ex-post facto basis, following ADB's review and acceptance of the feasibility report for the subproject.	Schedule. 5, para 11	Complied with.
The Borrower shall ensure that upon approval of a subproject for ADB financing under the Project, the province or region shall promptly onlend ADB's loan proceeds to the IAs pursuant to onlending agreements on terms and conditions identical to those applicable to ADB's loan.	Schedule. 5, para 12	Complied with. See onlending agreement.
The Borrower shall ensure that all facilities rehabilitated or restored under the Project are operated and maintained by the IA concerned after completion of the works. The Borrower shall cause the funds necessary for this purpose to be made available on a timely basis during and after project implementation.	Schedule. 5, para 13	Complied with.
The Borrower and ADB shall jointly carry out semiannual reviews of the Project to assess: Project implementation status; design and construction standards; physical progress made and disbursements in relation to the implementation schedule; performance of consultants and contractors; and status of compliance with the Loan Agreement.	Schedule. 5, para 14	Complied with. Semiannual reviews were carried out.
The Borrower shall cause the IAs to carry out the selected subprojects in accordance with the Borrower's environmental standards and regulations. Any potential negative environmental impacts of a Category A subproject shall be clearly described in an environmental impact assessment (EIA), which the EA shall submit to ADB as soon as it has been approved by the Borrower. For	Schedule 5, para 16	Verified during review missions; EIAs if required were submitted to ADB for approval.

Covenants	Reference in the Loan Agreement	Status of Compliance
Category B and Category C subprojects, the EA shall ensure that EIAs are prepared in accordance with the Borrower's regulations, and that these assessments are submitted to ADB for information prior to commencement of construction activities.		
The province and the region shall ensure that all land and rights-of-way required for the Project are made available in a timely manner.	Schedule. 5, para 17	Complied with.
For any subproject requiring resettlement, the province and the region shall prepare a detailed resettlement plan for ADB's review and approval.	Schedule. 5, para 18	Complied with. Detailed resettlement plans where required, were prepared and submitted to ADB for review and approval.
The province and the region shall consult closely with the minority affairs committees and minority representatives at the county, township and village levels to address the specific needs and preferences of affected minority households during preparation and implementation of the subprojects and any resettlement plans. All resettlement survey, monitoring, and evaluation data shall be disaggregated by minority group status.	Schedule. 5, para 20	Complied with.
The province and the region shall monitor project effects on women during implementation through gender-disaggregated data in the monitoring and evaluation reports and reports on resettlement, if any.	Schedule. 5, para 21	Complied with. The benefit monitoring and evaluation (BME) report submitted to ADB showed the gender-disaggregated data.
The province and the region shall conduct a benchmark survey at the commencement of the Project and shall prepare and submit to ADB project monitoring and evaluation reports upon completion and 1 year thereafter.	Schedule. 5, para 22	Complied with. The benchmark survey reports were submitted: IMAR Commencement: Oct 2001 Completion: Sep 2003 Heilongjiang province Commencement: 28 May 2001 Completion: Sept 2003 Jilin province Commencement: 10 Nov 2000 Completion: 24 Jan 2003

## DETAILS OF CONSULTING SERVICES

Position	Person-Months		Date of Services	
	Appraisal	Actual	Commenced	Completed
<b>L1685 - Inner Mongolia Autonomous Region</b>				
<b>A. International Consultants</b>				
Project Management Specialist	20.00	11.20	Jul 1999	Jul 2001
Project Management Specialist		8.32	Aug 2001	Apr 2003
BME Specialist	3.00	1.91	Jul 1999	Dec 1999
BME Specialist		1.84	Oct 2001	Sep 2003
<b>Total</b>	<b>23.00</b>	<b>23.27</b>		
<b>B. Domestic Consultants</b>				
Roads & Bridges	30.00	28.00	Jul 1999	Sep 2002
Water Resources	30.00	16.00	Jul 1999	Sep 2002
Urban Infrastructure	30.00	28.00	Jul 1999	Sep 2003
Interpreter/Translator		28.00	Jul 1999	Sep 2003
<b>Subtotal</b>	<b>90.00</b>	<b>100.00</b>		
<b>Total</b>	<b>113.00</b>	<b>123.27</b>		
<b>L1686 - Heilongjiang Province</b>				
<b>A. International Consultants</b>				
Project Management Specialist	20.00	12.04	Jul 1999	Oct 2000
Project Management Specialist		2.73	Aug 2001	Nov 2002
Project Management Specialist		1.50	Nov 2002	Apr 2003
BME Specialist	3.00	1.64	Oct 1999	Oct 2000
BME Specialist		2.10	Sep 2001	Sep 2003
<b>Total</b>	<b>23.00</b>	<b>20.01</b>		
<b>B. Domestic Consultants</b>				
Roads & Bridges	30.00	28.00	Jul 1999	Sep 2003
Water Resources	30.00	28.00	Jul 1999	Dec 2002
Urban Infrastructure	30.00	28.00	Jul 1999	Dec 2002
Interpreter/Translator		28.00	Jul 1999	Sep 2003
<b>Subtotal</b>	<b>90.00</b>	<b>112.00</b>		
<b>Total</b>	<b>113.00</b>	<b>132.01</b>		
<b>L1687-Jilin Province</b>				
<b>A. International Consultants</b>				
Project Management Specialist	20.00	20.00	Jun 1999	Apr 2002
BME Specialist	3.00	4.00	Nov 1999	Mar 2000
BME Specialist		2.00	Nov 2001	May 2002
<b>Subtotal</b>	<b>23.00</b>	<b>26.00</b>		
<b>B. Domestic Consultants</b>				
Roads & Bridges	30.00	30.00	Jun 1999	Oct 2001
Urban Infrastructure	30.00	8.00	Aug 1999	Jul 2000
Urban Infrastructure	30.00	12.00	Aug 2000	May 2002
<b>Subtotal</b>	<b>90.00</b>	<b>50.00</b>		
<b>Total</b>	<b>113.00</b>	<b>76.00</b>		
<b>Summary:</b>				
International Consultants	69.00	69.28		
Domestic Consultants	270.00	262.00		
<b>Grand Total</b>	<b>339.00</b>	<b>331.28</b>		

Source:

**PROCUREMENT OF EQUIPMENT AND CIVIL WORKS**  
**Equipment and Vehicles**

PCSS No.	Description	Actual Quantity	Cost		Date Procured	Mode of Procurement	Present Condition	Present User
			CNY	\$				
L1685-Inner Mongolia Autonomous Region								
22	Turbines and Generators	3	2,840,842	343,584	09-Dec-99	IS	Good	Yuming Hydropower Station
24	Transformer	1 set	164,000	19,807	16-Jul-99	IS	Good	Yuming Hydropower Station
25	High Voltage Switch Gear	6 sets	50,000	6,039	02/08/1999	IS	Good	Yuming Hydropower Station
26	Gate Crane Beam	1 set	61,000	7,367	28-Jun-99	IS	Good	Yuming Hydropower Station
27	Lefer Order	1 set	40,000	4,831	28-Jun-99	IS	Good	Yuming Hydropower Station
	Subtotal		3,155,842	381,628				
L1686-Heilongjiang Province								
15	Equipment of Cable,Pumps for emergency actions	LS	3,309,476	398,732	24-May-00	IS	Good	Harbin Drainage & Sewerage
16	Screen Equipment for Drainage and Sewerage	16 sets	3,236,087	389,890	28-Nov-00	IS	Good	Harbin Drainage & Sewerage
17	Instrumentation Equipment	285 sets	3,289,564	396,333	28-Nov-00	ICB	Good	Harbin Drainage & Sewerage
18	Pump Motors and Valves	174 sets	4,632,006	558,073	02-Jan-01	ICB	Good	Harbin Drainage & Sewerage
19	Electrical Equipment	LS	3,318,240	399,788	02-Jan-01	IS	Good	Harbin Drainage & Sewerage
37	Various Minor Materials for Pump Station	LS	606,813	73,408	01-May-00	DP	Good	Harbin Drainage & Sewerage
50	Water Intake Canal Equipment	LS	21,688	2,620	26 May 00	DP	Good	Harbin Drainage & Sewerage
82	Various Pump Equipment and Installation	LS	3,847,968	464,910	23-Nov-01	DP	Good	Harbin Drainage & Sewerage
85	Crane, Boilers, Boiler Subassembly and Gates	4 set	514,500	61,987	10 May 02	DP	Good	Harbin Drainage & Sewerage
	Sub-total		22,776,342	2,745,741				
L1687-Jilin Province								
72	Transformer, Control Box	LS	1,630,542	197,003	01-Sep-01	IS	Good	Baiching City, Jilin
74	Cable Bracket Bus Structure, Distribution Boxes, etc.	LS	972,158	117,457	02-Mar-01	IS	Good	BaiCheng
86	Misc. Minor Equipment	LS	675,977	81,443	15-Mar-01	DP	Good	Baiching & Zhenlai
88	Miscellaneous Minor Equipment	LS	419,797	50,578	24-Feb-01	DP	Good	ZhenLai
109	Misc. Equipment	LS	4,047,520	487,653	11-Sep-01	IS	Good	BaiCheng
	Subtotal		7,745,994	934,134				
Total			33,678,178	4,061,503				

DP= direct purchase, IS= international shopping, ICB= international competitive bidding  
Source: PMO

**PROCUREMENT OF EQUIPMENT AND CIVIL WORKS**  
**Loan 1685-PRC: Northeast Flood Damaged Rehabilitation Project - Inner Mongolia Autonomous Region**  
**Civil Works**  
(amount in million)

Serial No.	Name of Subproject	Mode of Procurement	Estimated Y	Total Cost		Actual Y	Ineligible Cost		eligible Cost		Date		Tax Paid
				\$			\$	Y	\$	Y	\$		Actual Work Commenced
Sector 1: Water Resources Infrastructure													
1	Hairisu Irrigation Scheme	FA, LCB	38.480	4.647	38.480	4.647	0	0	38.480	4.647	05-1999	10-2002	1.231
2	Yuming Hydropower Station	IS, LCB,FA	17.056	2.060	17.064	2.061	0	0	17.064	2.061	04-1999	9-2000	0.546
3	Daxing Shengli Canal Headwork	FA	4.460	0.539	4.460	0.539	0	0	4.460	0.539	06-1999	11-1999	0.143
4	Dongsheng Irrigation Scheme	FA	24.800	2.995	26.356	3.183	0	0	26.356	3.183	05-1999	10-2001	0.843
5	Chaersen Irrigation Scheme	FA, LCB	30.000	3.623	30.000	3.623	0	0	30.000	3.623	05-1999	10-2000	0.960
6	Hangali Reservoir	LCB	16.410	1.981	15.890	1.919	0	0	15.890	1.919	08-1999	07-2002	0.508
7	Qianjin Irrigation Scheme	FA, LCB	20.340	2.457	20.360	2.459	0	0	20.360	2.459	09-1999	11-2001	0.652
8	Duximiao Irrigation Scheme	FA, LCB	51.461	6.215	51.461	6.215	0	0	51.461	6.215	06-1999	10-2001	1.647
9	Chaersen Irrigation Scheme	FA, LCB	20.670	2.496	20.670	2.496	0	0	20.670	2.496	04-2001	10-2001	0.661
10	Tumuji Reservoir	FA	8.420	1.017	8.420	1.017	0	0	8.420	1.017	06-2000	10-2001	0.269
	Sub-total		232.097	28.030	233.161	28.159	0.000	0.000	233.161	28.159			7.461
Sector 2: Urban Facilities													
1	Zhalantun Bridge	LCB	24.540	2.964	25.036	3.024	0	0	25.036	3.024	04-1999	10-1999	0.854
2	Zhalantun Roads	LCB	28.000	3.382	25.698	3.104	0	0	25.698	3.104	05-1999	08-2000	0.876
3	Zhalantun Water Supply	LCB	20.000	2.415	19.401	2.343	0	0	19.401	2.343	05-1999	11-2000	0.662
4, 5	Najitun Bridge & Roads	LCB	22.530	2.721	23.040	2.783	0	0	23.040	2.783	05-1999	08-2000	0.786
6 & 7	Nierji Bridge & Roads	LCB	15.720	1.899	16.085	1.943	0	0	16.085	1.943	05-1999	10-2000	0.548
8	Aershan Roads	LCB	10.000	1.208	11.440	1.382	0	0	11.440	1.382	05-1999	06-2000	0.390
9	Aershan Water Supply	LCB	18.870	2.279	17.586	2.124	0	0	17.586	2.124	05-1999	11-2000	0.600
10 & 11	Bayanhushuo Bridge & Roads	LCB	22.640	2.734	22.640	2.734	0	0	22.640	2.734	05-1999	10-2000	0.772
12	Wulanhaote Water Supply	FA,LCB	18.400	2.222	18.420	2.225	0	0	18.420	2.225	04-1999	09-2000	0.628
13	Yinder Roads	LCB	12.400	1.498	12.515	1.511	0	0	12.515	1.511	04-1999	10-1999	0.427
14	Huolinguole Bridge		2.913	0.352	4.055	0.490	0	0	4.055	0.490	05-2000	11-2000	0.138
15	Huolinguole Roads	FA	5.980	0.722	5.650	0.682	0	0	5.650	0.682	05-1999	11-2000	0.193
16	Huolinguole Water Supply	FA,LCB	35.020	4.229	34.726	4.194	0	0	34.726	4.194	04-1999	11-2000	1.184
17	Tongliao Roads	LCB	64.780	7.824	62.566	7.556	0	0	62.566	7.556	05-1999	11-2000	2.134
18	Lubei Roads	FA,LCB	16.740	2.022	17.206	2.078	0	0	17.206	2.078	06-1999	09-2000	0.587
19	Wulanhaote Roads	FA,LCB	18.179	2.196	17.770	2.146	0	0	17.770	2.146	04-2002	10-2002	0.606
20	Bayanhushuo Roads	FA,LCB	12.800	1.546	12.800	1.546	0	0	12.800	1.546	04-2002	10-2002	0.436
21	Tuquan Roads	FA,LCB	23.640	2.855	23.640	2.855	0	0	23.640	2.855	06-2001	08-2002	0.806
22 & 23	Yinder Drainage & Roads	LCB	36.400	4.396	36.400	4.396	0	0	36.400	4.396	04-2001	10-2001	1.241
24	Aershan Roads	LCB	36.400	4.396	16.429	1.984	0	0	16.429	1.984	08-2000	10-2001	0.560
	Sub-total		445.952	53.860	423.103	51.100	0.000	0.000	423.103	51.100			14.428
Sector 3: Highways													
1	NH 111 Wulanhaote to Xinlinbei	FA,LCB	359.000	43.357	380.700	45.978	91.368	11.008	289.332	34.859	05-1999	07-2002	9.548
2	PH 101 Aershan to Huolinguole	FA,LCB	333.000	40.217	358.110	43.250	93.109	11.218	265.001	31.928	06-1999	10-2002	8.745
3	NH 111 Xinlinbei to Zhalantun	LCB	173.000	20.894	251.900	30.423	45.342	5.463	206.558	24.887	05-2000	10-2002	6.816
4	NH 111 Najitun to Nierji	LCB	167.000	20.169	221.220	26.717	39.820	4.798	181.400	21.855	05-2000	10-2002	5.986
5	NH 304 Shebetu to Huolinguole	FA,LCB	398.000	48.068	450.390	54.264	43.535	5.245	406.855	49.019	06-1999	10-2002	13.426
	Sub-total		1430.000	172.705	1,662.32	200.632	313.17	37.732	1349.146	162.548			44.522
Total			2,108.05	254.60	2,318.58	279.89	313.17	37.73	2,005.41	241.81			66.411

FA= force account, LCB = local competitive bidding

Note: The exchange applied 1US\$=8.3Y

## Loan 1686-PRC: Northeast Flood Damaged Rehabilitation Project - Heilongjiang Province

## Civil Works

(amount in million)

Contract No.	Name of Subproject	Mode of Procurement	Estimated CNY	Total Cost		Ineligible Cost		eligible Cost		Date		Tax Paid CNY	
				\$	CNY	\$	CNY	\$	CNY	Actual Work Commenced	Actual Work Completed		
Sector 1: Roads and Highways													
H-RH-1	Nianbei	LCB,FA	194.000	23.148	192.128	23.148	48.032	5.787 <span>▼</span>	144.096	17.361	Mar-99	Oct-01	6.340
H-RH-2	Nianbei	LCB,FA	295.900	35.651	303.37	36.551	75.843	9.138 <span>▼</span>	227.528	27.413	Mar-99	Oct-01	10.011
H-RH-4	Nianbei	LCB,FA	284.100	34.229	275.411	33.182	60.590	7.300 <span>▼</span>	214.821	25.882	Apr-99	Oct-01	9.089
H-RH-6	Qigan	LCB,FA	349.9	42.157	352.202	42.434	207.80	25.036 <span>▼</span>	144.403	17.398	Mar-99	Oct-02	11.623
H-RH-7	Lintai	LCB,FA	154.400	18.602	157.744	19.005	11.04	1.330 <span>▼</span>	146.702	17.675	Sep-99	Aug-02	5.206
H-RH-9	Xinzhao	LCB ,FA	300.570	36.213	260.533	31.39	13.03	1.569 <span>▼</span>	247.506	29.820	Sep-99	Oct-02	8.598
Subtotal			1,578.87	190.00	1,541.39	185.710	416.333	50.161	1,125.055	135.549			50.866
Sector 2: Urban Facilities													
H-U-01	Harbin Pump Stations	FA,ICB	77.680	9.359	82.03	9.89	0	0	82.03	9.89	Dec-99	Jun-02	0.14 <span>▼</span>
Subtotal			77.680	9.359	82.030	9.890	0	0	82.030	9.890			0.14
Sector 3: Water Resources													
H-WR-01	Nanyin Reservoir	FC,LCB	33.676	40.202	157.058	18.923	0.00	0.00	157.058	18.923	Apr-99	Oct-02	0.61 <span>▼</span>
Subtotal			33.676	40.202	157.058	18.923	0.00	0.00	157.058	18.923			0.69
Total Cost			1,690.23	239.56	1,780.48	214.52	416.33	50.16	1,364.14	164.36			51.696

LCB=local competitive bidding, FA= force account, ICB= international competitive bidding

Note: \$1= CNY8.30

**PROCUREMENT OF EQUIPMENT AND VEHICLES**  
**Loan 1687-PRC: Northeast Flood Damaged Rehabilitation Project - Jilin Province**  
**Civil Works**  
(amount in million)

Contract No.	Name of Subproject	Mode of Procurement	Estimated CNY	Total Cost		(amount in million)		Ineligible Cost		Eligible Cost		Date		Tax Paid
				\$	CNY	\$	CNY	CNY	\$	CNY	\$	Actual Work Commenced	Actual Work Completed	CNY
Sector 1: Urban Facilities														
J-U-1	Da'an	FA, LCB	75.003	9.04	75.003	9.04	0	0	75.003	9.037	04-1999	09-2001	2.558	
J-U-2	Taonan	FA, LCB	186.000	22.41	186.000	22.41	0	0	186.000	22.410	06-1999	09-2001	6.343	
J-U-3	Baicheng	FA, LCB,DP	64.069	7.72	64.069	7.72	0	0	64.069	7.719	05-2000	09-2001	2.185	
J-U-5	Songyuan	FA, LCB	175.000	21.08	175.000	21.08	0	0	175.000	21.084	07-1999	09-2001	5.968	
J-U-8	Zhenlai	FA, LCB	37.180	4.48	37.180	4.48	0	0	37.180	4.480	05-2000	09-2001	1.268	
J-U-9	Liaoyuan	FA,LCB	93.190	11.23	93.190	11.23	0	0	93.190	11.228	05-2001	09-2001	3.178	
	Subtotal		630.442	75.957	630.442	75.957	0.000	0.00	630.442	75.957			21.498	
Sector 2: Roads and Bridges														
J-RH-1	Baicheng-Gashigen Hiway	FA,LCB	434.579	52.36	437.307	52.688	171.145	20.620	266.162	32.068	08-1999	09-2001	8.783	
J-RH-2 to JRH-15	Feeder Roads	FA, LCB	482.918	58.18	482.917	58.183	0	0	482.917	58.183	08-1999	09-2001	15.936	
JRH-16	Changshan & Daobao Bridges	FA,LCB	78.670	9.48	78.699	9.482	41.71	5.025	36.989	4.457	04-1999	09-2001	1.221	
J-RH-17 to JRH-31	Class III Roads	FA,LCB	114.062	13.74	114.061	13.742289	0	0	114.061	13.742	05-2001	09-2001	3.764	
	Subtotal		1,110.229	133.763	1,112.984	134.094	212.855	25.645	900.129	108.449			29.704	
	Total Cost		1,740.671	209.719	1,743.426	210.051	212.855	25.645	1,530.571	184.406			51.202	

LCB= local competitive bidding, FA= force account, DP= direct purchase  
Note: \$1= CNY8.30

## ASSESSMENT OF PROJECT ECONOMIC BENEFITS

### A. Background

1. At appraisal, no economic internal rate of return (EIRR) was calculated for the Project as the 3 loans were processed under the emergencies procedures of the Asian Development Bank (ADB). Also, the Project consisted of a large number of discrete subprojects, whose final composition, design, and costing were not known at the time of appraisal. Whereas 62 subprojects were identified as “indicative candidate subprojects”<sup>1</sup> at appraisal, 56 subprojects were actually carried out. These subprojects undertaken differed in their composition, scale, and scope from those identified at appraisal.

2. The Project’s objective was to enable the populations affected by the 1998 floods to return to their normal economic and social activities as quickly as possible. Efficiency in this context was focused on identifying least-cost engineering solutions, although it was necessary to consider the appropriateness of the original infrastructure given the technological, environmental, and demographic changes that had occurred since the original infrastructure had been put in place.

3. Also important from an economic efficiency perspective was to ensure

- (i) enhancements in scope and scale for infrastructure over and above the rehabilitation of flood damage<sup>2</sup> were justified in terms of the additional economic benefits to be achieved as compared to the additional economic costs;
- (ii) the rehabilitated and enhanced infrastructure was less susceptible to future flooding events; and
- (iii) sufficient operation and maintenance (O&M) budgets were provided for the infrastructure rehabilitated and/or improved under the Project.

4. As one of the requirements for subproject approval, to be financed with loan proceeds, a subproject had to have an EIRR of no less than 12%, although an EIRR of 10% was acceptable in special cases where there were significant nonquantified benefits. Where a subproject had a total cost estimated at over \$10 million equivalent, an economic analysis demonstrating an EIRR of no less than 12% had to be included in the feasibility report, which had to be submitted to ADB for approval before the implementing agency (IA) proceeded with bidding, contract award, or other implementation activity.<sup>3</sup>

5. At appraisal, no least-cost solutions were identified because final subproject selection, scoping, and costing was not done. This was done during project implementation where least-cost analysis was included in the feasibility studies, which contained reasonably sophisticated analysis of the engineering solutions to be adopted.

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<sup>1</sup> ADB 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of China for the Northeast Flood Damage Rehabilitation Project*. Manila (Loan No. 1685/1686/1687-PRC, approved on 22 April 1999 for \$100 million each).

<sup>2</sup> In some cases, these were allowed as eligible expenditure and funded by a combination of ADB loan and local counterpart funding. In other cases, the expansions in infrastructure scope and scale were classified as ineligible expenditure and funded only by counterpart funds but undertaken at the same time and as part of the same contracts as eligible expenditure.

<sup>3</sup> See RRP (footnote 2), Appendix 2, paragraphs 9(ix) and 12. Having an estimated cost of over \$10 million equivalent was one of the criteria classifying a subproject as requiring the feasibility report to be submitted to ADB for the subproject to be approved for loan financing prior to subproject implementation commencing. Subprojects requiring a resettlement plan or an environmental impact assessment (EIA) also required prior ADB approval.



6. A review of a number of the feasibility reports submitted to ADB indicates that only a brief summary of the economic analysis was included with a limited discussion of key assumptions, results, and sensitivity testing. A full list of all assumptions and workings were not shown and there were no instances where ADB approval for a subproject was withheld on the basis of the estimated EIRR being insufficiently justified. The PCR Mission was informed, by the IAs that it met, that the EIRR analyses (together with other aspects of the feasibility reports) were usually contracted out to government research institutes and it appears that such analyses were seen simply as prerequisites for ADB subproject approval rather than as tools for optimizing subproject formulation and prioritizing subprojects. While there were some errors identified in the economic analysis, the major concern was the limited reporting of the economic analysis assumptions and workings, making it difficult to assess the overall quality of the economic analysis. This appeared to result from the economic analysis being contracted out to research institutes. Had ADB insisted on more details of the economic analysis presented in the feasibility studies and perhaps asked questions about the veracity of assumptions, this may have led to the economic analysis being used more as a tool to optimize project design rather than just being carried out as a requirement of subproject approval. On the other hand, this would have delayed project implementation.

## **B. Benefit Monitoring and Evaluation**

7. The economic aspects of the benefit monitoring and evaluation (BME) work that has been initiated under the Project has not been integrated with or built on the feasibility study economic analyses. Instead, general information has been gathered about economic impacts on the basis of site visits, focus group meetings, and household and business surveys. However, some of the information gathered may be relevant to any future updating of the preapproval feasibility study economic analyses.<sup>4</sup>

8. The BME work, which has been initiated under the Project, has been for a sample of nine subprojects 4 in Inner Mongolia Autonomous Region (IMAR), 3 in Heilongjiang, and 2 in Jilin—and involve 3 subprojects in each of the water infrastructure, roads and bridges, and urban facilities sectors.

9. The international monitoring and evaluation specialist engaged under the Project reported difficulties in generating interest in, and counterpart funding for, BME activities. This is understandable where the Project's first priority was to restore damaged existing facilities. Frequently the subprojects incorporated high sunk costs, suggesting high EIRRs even without quantitative analysis.

10. Compounding this is the strong trend toward urbanization, the move toward motorized transport for commercial and private use, and the high absolute and relative rates of economic growth being experienced in the project area. Against a current estimate for calendar year gross domestic product (GDP) of 7.8% for the People's Republic of China (PRC) in 2003, GDP growth rates for IMAR, Heilongjiang, and Jilin are expected to be in excess of 9%.<sup>5</sup> In such an economic climate, priority is given to providing new infrastructure and the removal of potential bottlenecks rather than evaluating the successes and failures of past investments.

<sup>4</sup> For example, for some of the roads and bridges sector subprojects, traffic flow data have been collected.

<sup>5</sup> Source: Estimates provided to the PCR Mission by respective bureau of finance staff in IMAR and the two provinces.

11. Other obstacles to initiating updated economic analysis in the case of urban facilities sector subprojects is that the economic benefits may be difficult to quantify in dollar terms (in the case of water and sewage treatment and reticulation, and storm water drainage works)<sup>6</sup> or require the use of complex computerized network models to determine vehicle operating and travel time savings for diverted and generated traffic that has many different origins and destinations (in the case of urban roads rehabilitation).

12. Frequently, urban road rehabilitation, renewal, and upgrading is done for beautification and “prestige” reasons and the economic benefits are more related to wider macroeconomic benefits associated with the attraction of investment to a city and the consequent generation of jobs and economic growth. In such cases there is no focus on the microeconomic benefits such as vehicle operating cost and travel time cost savings. Where this is the case, monitoring and evaluation of the economic benefits of individual infrastructure investments are unlikely.

13. Table A9 summarizes the economic impacts that have been reported for the sample of 9 subprojects selected for monitoring and evaluation under the Project. Together they account for total expenditure of \$163.9 million, or 21% of total project expenditure.<sup>7</sup>

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<sup>6</sup> Although most of the urban facilities sector IAs spoken to during the PCR Mission indicated that they had in place reasonably advanced user charge systems for water and drainage, implying that financial rates of return could be calculated reasonably easily. To the extent that financial charges represent minimum willingness-to-pay measures of economic benefits, conservative EIRR estimates could also be determined.

<sup>7</sup> Excluding interest during construction costs, but including both eligible and ineligible expenditures.

**Table A9: Summary of Results of Benefit Monitoring and Evaluation Carried Out Under the Project**

Province/ Region	Project Name	Sector	Description of Benefit Monitoring and Evaluation Results
IMAR	Tongliao Urban Roads	Urban Facilities	Sharply increased business activity along entire route.
IMAR	Wulanhoate-Xinlinbei Highway	Roads and Bridges	Reduced transport costs, greater access to markets, travel time savings, and easier access to services such as education, health care, and agricultural advisory services. Motorized traffic increased by 20% in 12-month period after highway rehabilitation. Ten households that required resettling were satisfied with compensation process and their new circumstances.
IMAR	Chaerson Reservoir Irrigation Supply Project	Water Resources	Surveyed economic impacts inconclusive as drought has caused a number of surveyed beneficiaries to move.
IMAR	Yuming Power Station	Water Resources	More reliable power supply and irrigation available for existing residents and new immigrants. Surveyed farm family incomes increased by 73% as a consequence of irrigation. Power generation still well below capacity due to water shortages.
Heilong-jiang	Nanyin Reservoir	Water Resources	Nonavailability of water due to drought has meant farmers have had to turn to alternative sources of supplies (bores) and other sources of income (poultry raising). Water volume now restored and expected to be available for 2004 growing season. Farmers expected to use reservoir water as cheaper than bores. Intention to supply major oil industry customer has not eventuated.
Heilong-jiang	Xinzhao Highway	Roads and Bridges	Reduced transport costs, greater access to markets, travel time savings, and easier access to services such as education, health care, and agricultural advisory services. Latest traffic volume figures suggest growth of 130% over the period 1998 to 2003. Resettlement of 5 families required. They have been provided with better quality and larger houses and same size farmland areas. They are all satisfied with their new circumstances. Environmental monitoring of operational effects inconclusive as done during the severe acute respiratory syndrome (SARS) crisis when traffic volumes were temporarily suppressed.
Jilin	Zhenai County Water Supply	Urban Facilities	Survey of water quality, water availability, and health outcomes shows major improvements. Recalculated financial internal rate of return shows a pretax rate of 19%. The environmental impact assessment requirements during construction were complied with.
Jilin	Baicheng-Gashigen Highway	Roads and Bridges	Reduced transport costs, greater access to markets, travel time savings, and easier access to services such as education, health care, and agricultural advisory services. Traffic account analysis showed an 11% increase in 12 months after subproject completion for Baicheng to Zhenlai section, but a 6% fall for Zhenlai to Gashigen section. The fall in traffic volume on this link is attributed to the drought. Farm family income survey also shows falling trend, again presumed a consequence of the drought conditions. Eight households that required resettling were satisfied with the compensation process and their new circumstances.

IMAR= Inner Mongolia Autonomous Region.  
Source: ADB and Borrower's PCR.

### C. Project Economic Benefits—Flood Protection

14. At appraisal, the 1998 floods were estimated to have caused \$7.3 billion direct damage costs, the loss of 154 lives, and affected the lives of 16.1 million people. (see footnote 2) In addition to the direct damage costs, indirect damage costs including clean-up costs and the loss of business profits were considerable.

15. A significant aspect of project economic benefits is therefore the reduction in susceptibility to future flooding of the infrastructure, which has been rehabilitated under the Project. Also a number of the subprojects—i.e., those including the rehabilitation and improvement of dikes, storm water reticulation, and drainage pumping systems—contain components that will reduce the susceptibility to future flood damage of noninfrastructure assets including agricultural, commercial, and residential property. The 1998 floods were estimated to have a return period of 150 years<sup>8</sup> and the subproject selection and approval criteria allowed for expenditure on works to enhance flood protection to be eligible for financing with the loan proceeds. Information provided by IAs to the PCR Mission indicated that rehabilitated and improved infrastructure under the Project had enhanced flood protection—against 100- to 300-year return-period floods for major highways and bridges, against 50-year return-period floods for minor roads and 30 years for rural water infrastructure facilities.<sup>9</sup> There was uncertainty about the design standards of infrastructure facilities prior to the floods in 1998, but the general consensus was that flood protection levels of most of the infrastructure rehabilitated under the Project had at least doubled. In addition, a number of facilities—dikes, storm water drains, and pump stations—were built to specifically protect infrastructure and noninfrastructure assets against future flooding.

16. From the sample of the feasibility studies reviewed for the PCR Mission, there appears to have been no work done to quantify the annual savings in expected direct and indirect flood damage costs as a consequence of this enhanced flood protection. For a number of subprojects, these annual benefits will be significant and where urban property assets are protected could be expected to grow each year in line with GDP forecasts as property values and business activity increase.

#### 1. Agricultural Benefits

17. A number of the water resources infrastructure sector subprojects<sup>10</sup> included components rehabilitating or extending irrigation systems for the production of crops, including fodder for livestock. Because of the harsh winter conditions in the project area, only a single crop can be grown each year. Paddy and maize are the predominant crops grown where irrigation was rehabilitated or extended by the Project. Unfortunately, single cropping of these crops yields limited returns. Farmers spoken to during the PCR Mission reported gross margins

<sup>8</sup> Project Management Office. 2002. Northeast Flood Damage Rehabilitation Project (Jilin). *Project Completion Report* (ADB Loan 1687).

<sup>9</sup> It is not necessarily economically efficient to build flood protection capabilities to withstand all known floods, including the estimated 150-year return period floods of 1998. The additional costs of such protection may be less than the discounted sum of the expected saved flood damage costs because of the low probability associated with the very high return period floods. This is particularly the case when relatively lower-valued agricultural crops and low-density rural buildings are being protected as compared to higher-valued urban property. Where an increased flood protection standard is less than a particular flood return period, the damage cost—should that particular flood occur—will usually be lessened, albeit not eliminated.

<sup>10</sup> The PCR Mission visited in IMAR the Yuming hydroelectric station, the Hairisu irrigation system, and the Dongsheng irrigation system; and in Heilongjiang province the Nanyin reservoir.

for paddy of around CNY200/*mu*, or CNY3,000 (\$363)/ha, based on yields of 400 kg/*mu* or 6 t/ha, a farmgate price for paddy of CNY1.5/kg and production costs, including their own labor valued at CNY20/day, of CNY200/*mu*.

18. The project preparation technical assistance (PPTA) report for the Songhua River Flood Management Sector Project<sup>11</sup> identifies economic gross margins for paddy of CNY157.4/*mu* or CNY2,360 (\$285)/ha and even less (CNY136.7/*mu* or CNY2,050 (\$248)/ha) for maize.<sup>12</sup> These comparatively low returns, exacerbated in some cases, e.g., the Chaersen irrigation subproject in IMAR, by water shortages due to drought conditions, suggest that economic returns from the water resources infrastructure sector subprojects involving irrigation components are not likely to be yielding high EIRRs and such activities are more likely to have been included in the Project for poverty reduction rather than economic efficiency reasons. This conclusion is consistent with the difficulties for the IAs to secure counterpart funding for a number of the initially proposed water resources infrastructure sector subprojects and with an increased proportion of the ADB loan funding being used for subprojects in the other two sectors.

19. Some of the irrigation water supply systems rehabilitated or expanded under the Project are used to cultivate fodder grown for raising livestock. For example, under the Dongsheng irrigation scheme, 2,500 enclosed pasture areas (*chaukuluns*), each of 30 *mu* or 2 ha, have been established for the production of fodder for livestock. However, while beneficial to the farm family recipients, the returns from dedicated fodder production are still likely to be modest and the establishment of these *chaukuluns* appears to principally help solve the environmental problems caused by overgrazing of grasslands.

## 2. Roads and Bridges

20. The roads and bridges sector subprojects are those linking the major cities and towns and exclude roads within urban centers ("urban roads"). From perusal of a number of the feasibility study reports for these subprojects, it appears that detailed traffic count analysis was done prior to their implementation. Under the Project, some additional capacity was allowed to be built into the rehabilitated roads. In addition, all of the roads and bridges subprojects in IMAR and Heilongjiang province and 2 of the 4 in Jilin province (i.e., in total 13 of the 15 roads and bridges sector subprojects), utilized additional counterpart funding to cover expansions to the highway network, which were deemed to be "ineligible" works.

21. Without undertaking further traffic counts and detailed analysis, possibly requiring computerized network models, it is not possible to ascertain whether the EIRR estimates prior to the subprojects' implementation are being achieved. However, 2 factors suggest that the expansion of the networks' capacity in the project area is economically justified. First, the economic growth rates in IMAR, and in Heilongjiang and Jilin provinces are estimated to be running at above 9% per annum, higher than the national average, currently estimated to be 7.8% for 2003. Second, with the rapid economic growth and increases in average incomes, motor vehicle ownership and use will increase.

<sup>11</sup> ADB TA 3376-PRC: Songhua River Flood, Wetland, and Biodiversity Management. The Songhua River flows through parts of the project area.

<sup>12</sup> Key assumptions are: (i) for paddy, a farmgate economic price of CNY1.19 based on an average of export and import parity values, a yield of 400/kg, and a shadow-priced farm labor cost of CNY15/day; and (ii) for maize, a farmgate economic price of CNY0.90/kg based on an average of import and export parity values, a yield of 400 kg/*mu* and a shadow-priced farm labor cost of CNY15/day.

22. As a consequence, the economic benefits of the subprojects in the form of vehicle operating cost and travel time cost savings are likely to grow rapidly.

23. Road accident costs on the other hand were reported to the PCR Mission by staff of the departments of communications to have increased since the subprojects' implementation, reflecting growth in traffic volumes and speeds.

### **3. Urban Roads**

24. The rehabilitation and improvement of roads within urban areas also brings benefits in the form of savings in vehicle operating costs and travel time costs. For example, the rehabilitation of urban roads in Tongliao city under the Project was estimated to save an average of 20 minutes for journeys into and out of the city.<sup>13</sup> Also, where improvements enabled better separation of motor vehicles, cyclists, and pedestrians, accident cost savings were also possible.

25. The immediate objective of the Project was to restore normal levels of economic and social activity after the flooding, and rehabilitating urban roads was one of the means of achieving this, especially for businesses and residents adjacent to urban roads made impassable or at least much more difficult to negotiate as a consequence of the flooding. However, from a national economic perspective, the restoration of trade for businesses affected will quite frequently result in trade being diverted away from businesses located elsewhere in the urban area. Such trade effects are therefore only transfers and not economic benefits to be incorporated in EIRR calculations.

26. Also, some of the gains in trade experienced since the Project's implementation will have resulted from economic growth generally. Such gains cannot be attributed to the Project.

27. The BME work initiated under the Project does not appear to differentiate between these different types of economic impact.

### **4. Other Urban Facilities**

28. Among the other urban facilities improved under the Project are water treatment plants, water reticulation, sewage treatment plants, sewage reticulation, storm water drainage reticulation, and pumping stations. The economic benefits of rehabilitating these facilities are difficult to quantify, although the existence of reasonably comprehensive user charges for water<sup>14</sup> in the PRC provides willingness-to-pay proxy values.

### **5. Employment Creation**

29. During project implementation, rural and urban unskilled workers benefited from the numerous employment opportunities created by the Project. At appraisal, a total of 20,000 temporary jobs in each of IMAR, Heilongjiang province, and Jilin province over at least 2 construction seasons were anticipated.

<sup>13</sup> Source: Department of Communications staff, Tongliao.

<sup>14</sup> Moves are currently being made for the introduction of surcharges on water charges to recover sewage reticulation and disposal costs.

30. Typically, these temporary jobs for unskilled workers were for the 5-month construction season at a rate of around CNY20 to CNY30 per day<sup>15</sup>—i.e., CNY3,000 to CNY4,500 per construction season—with free food and accommodation. An approximate estimate for the labor content of civil works contracts is 10% to 15% of total costs and perhaps 5% to 10% for unskilled labor.<sup>16</sup> Assuming 7.5% of the project expenditure on subprojects was for unskilled labor at a daily rate of CNY25 per day gives a total of 53,176 temporary jobs for 2 years or an average of 17,725 jobs for each of IMAR and the 2 provinces. While this estimate is only very approximate, it indicates that the assessment of temporary unskilled employment creation at appraisal was reasonable.

31. These temporary jobs would have been extremely beneficial, especially for rural workers whose livelihoods had been affected by the floods. To the extent that such jobs mopped up unemployment or underemployment in the project area, this would enhance the EIRR calculations via the appropriate downward shadow pricing of labor. The Songhua River TA Report uses a shadow price factor for farm labor of 0.75.

#### **D. Economic Internal Rate of Return for the Total Project**

32. Having regard to: (i) the high level of sunk costs in an emergency infrastructure rehabilitation project such as this; (ii) the expected high rates of return for roads and bridges sector and urban facilities sector subprojects, reflecting high economic growth rates, rapid urbanization, and rapidly growing motor vehicle ownership and use in the project area; (iii) roads and bridges sector subprojects utilizing 70.7% and urban facilities sector projects utilizing 21.6% of total project eligible expenditure base costs (i.e., excluding project management, taxes, and interest during construction); (iv) water resources infrastructure sector subprojects utilizing only 7.7% of total eligible expenditure base costs; and (v) a justification for shadow pricing downward at least some of the labor component of project civil works costs, it seems likely that the overall EIRR for the Project in terms of the eligible expenditure works would be satisfactory (i.e., over 12%). This conclusion is also likely to hold for the expanded Project including the expenditure on ineligible works, since this additional expenditure was confined to the roads and bridges and urban facilities sector subprojects only.

<sup>15</sup> As compared to a rate for farm labor of around CNY20 per day.

<sup>16</sup> Source: Engineering consultant to PMO, IMAR.

