

ASIAN DEVELOPMENT BANK

PCR: PRC 22279

PROJECT COMPLETION REPORT

ON THE

**FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(Loan 1248-PRC)**

IN

PEOPLE'S REPUBLIC OF CHINA

November 2002

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal (30 April 1993)	At Project Completion (31 July 2002)
CNY1.00	=	\$0.173	\$0.121
\$1.00	=	CNY5.787	CNY8.30

ABBREVIATIONS

ACFP	–	Anyang Chemical Fertilizer Plant
ADB	–	Asian Development Bank
ECFP	–	Exi Chemical Fertilizer Plant
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
GCFP	–	Guizhou Chemical Fertilizer Plant
GJ	–	gigajoule
ha	–	hectare
HCFP	–	Hechi Chemical Fertilizer Plant
HGCP	–	Huainan General Chemical Plant
HLCP	–	Heilongjiang Chemical Plant
MCI	–	Ministry of Chemical Industry
MOF	–	Ministry of Finance
mt/yr	–	metric tons per year
PCFP	–	Pingdingshan Chemical Fertilizer Plant
PIA	–	project implementing agency
PRC	–	People's Republic of China
SAPCI	–	State Administration of Petroleum and Chemical Industries
SCFP	–	Shaanxi Chemical Fertilizer Plant
SOE	–	state-owned enterprise
WACC	–	weighted average cost of capital
ZCFP	–	Zhanyi Chemical Fertilizer Plant

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December.
- (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 Number	1248-PRC
3.	Project Title	Fertilizer Industry Restructuring
4.	Borrower	People's Republic of China
5.	Executing Agency	Ministry of Chemical Industry
6.	Amount of Loan	US\$249.91 million
7.	PCR Number	PCR: PRC 707

B. Loan Data

1.	Appraisal	
	– Date Started	13 Apr 1993
	– Date Completed	29 Apr 1993
2.	Loan Negotiations	
	– Date Started	21 Jul 1993
	– Date Completed	22 Jul 1993
3.	Date of Board Approval	24 Aug 1993
4.	Date of Loan Agreement	26 Apr 1994
5.	Date of Loan Effectiveness	
	– In Loan Agreement	25 Jul 1994
	– Actual	14 Jul 1994
	– Number of Extensions	None
6.	Closing Date	
	– In Loan Agreement	30 Jun 1998
	– Actual	6 Oct 2000
	– Number of Extensions	3
7.	Terms of Loan	
	– Interest Rate	Pool-based variable lending rate for US\$
	– Maturity (number of years)	20
	– Grace Period (number of years)	5
8.	Terms of Relending (if any)	
	– Interest Rate	Same as loan
	– Maturity (number of years)	20
	– Grace Period (number of years)	5
	– Second-step Borrowers	Anyang Chemical Fertilizer Plant (ACFP) Guizhou Chemical Fertilizer Plant (GCFP) Hechi Chemical Fertilizer Plant (HCFP) Heilongjiang Chemical Plant (HLCP) Huainan General Chemical Plant (HGCP) Pingdingshan Chemical Fertilizer Plant (PCFP) Shaanxi Chemical Fertilizer Plant (SCFP) Zhanyi Chemical Fertilizer Plant (ZCFP)

9. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
5 Dec 1994	6 Oct 2000	5 years, 10 months
Effective Date	Original Closing Date	Time Interval
14 Jul 1994	30 Jun 1998	3 years, 11.5 months

b. Amount (\$ million)

Subproject	Original Allocation	Last Revised Allocation	Amount Disbursed	Undisbursed Balance	Amount Canceled
1 ACFP – Machinery, Equipment, Training, and IDC	21.94	26.20	26.49	(0.29)	(0.39)
2 ECFP – Machinery, Equipment, Training, and IDC	23.11	0.00	0.00	0.00	0.00
3 GCFP – Machinery, Equipment, Training, and IDC	25.49	26.10	26.40	(0.30)	(0.30)
4 HCFP – Machinery, Equipment, Training, and IDC	23.62	28.70	28.41	0.29	0.29
6 HGCP – Machinery, Equipment, Training, and IDC	39.74	48.50	48.04	0.46	0.46
5 HLCP – Machinery, Equipment, Training, and IDC	33.18	38.40	38.07	0.33	0.33
7 PCFP – Machinery, Equipment, Training, and IDC	22.11	25.60	25.62	(0.02)	(0.02)
8 SCFP – Machinery, Equipment, Training, and IDC	29.53	33.00	33.82	(0.82)	(0.82)
9 ZCFP – Machinery, Equipment, Training, and IDC	21.85	23.50	23.06	0.44	0.44
10 Unallocated	9.43	0.00	0.00	0.00	0.00
Total	250.00	250.00	249.91	0.09	0.09

ECFP= Exi Chemical Fertilizer Plant, IDC = interest during construction.

10. Local Costs (Financed)

- Amount (\$)	Nil
- Percentage of Local Costs	Nil
- Percentage of Total Cost	Nil

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	250.00	249.91
Local Currency Cost	326.76	541.81
Total	576.76	791.72

^a Estimate is for nine subprojects. The actual estimate for the eight subprojects excluding the Exi Chemical Fertilizer Plant is \$513.98 million.

2. Cost and Financing Plan by Subproject (\$ million)

Item	ADB	Appraisal Estimate			Total	FX	Actual			Total
		Enterprise's Contribution	Domestic Loans	Sub-total			ADB	LC		
						Enterprise's Contribution		Domestic Loans	Sub-total	
1. ACFP	21.94	5.00	26.52	31.52	53.46	26.49	22.97	34.96	57.93	84.42
2. ECFP	23.11	0.00	30.24	30.24	53.35	0.00	0.00	0.00	0.00	0.00
3. GCFP	25.49	2.53	24.98	27.51	53.00	26.40	1.43	31.90	33.33	59.73
4. HCFP	23.62	4.94	22.37	27.31	50.93	28.41	11.70	35.02	46.72	75.13
6. HGCP	39.74	11.03	69.34	80.37	120.11	48.04	35.97	68.22	104.19	152.23
5. HLCP	33.18	4.00	52.24	56.24	89.42	38.07	27.01	126.35	153.36	191.43
7. PCFP	22.11	4.82	20.50	25.32	47.43	25.62	21.90	34.09	55.99	81.61
8. SCFP	29.53	8.05	14.67	22.72	52.25	33.82	24.80	25.66	50.46	84.28
9. ZCFP	21.85	6.90	18.61	25.51	47.36	23.06	16.34	23.49	39.83	62.89
10. Unallocated	9.43	0.00	0.00	0.00	9.43	0.00	0.00	0.00	0.00	0.00
Total	250.00	47.27	279.47	326.74	576.74	249.91	162.12	379.69	541.81	791.72

ECFP = Exi Chemical Fertilizer Plant, FX = foreign exchange, LC = local currency.

3. Project Schedule

Milestone	Appraisal Estimate	Actual
Completion of Detailed Engineering Designs		
ACFP	Oct 1996	May 1996
GCFP	Dec 1997	May 2000
HCFP	Oct 1996	Jul 1995
HGCP	Jun 1999	Jun 1999
HLCP	Jun 1996	Jun 1996
PCFP	Mar 1997	Jan 1997
SCFP	Feb 1997	Jul 1998
ZCFP	Mar 1997	Dec 1996
Completion of Civil Works		
ACFP	Sep 1998	Aug 1995
GCFP	Feb 1998	Aug 2001
HCFP	Sep 1998	Aug 1995
HGCP	Mar 1998	Apr 1998
HLCP	Mar 1997	Mar 1997
PCFP	Jul 1997	Dec 1997
SCFP	Dec 1997	Oct 1999
ZCFP	Mar 1998	Mar 1998
Procurement of Urea Plant		
ACFP	Apr 1996	Jul 1995
GCFP	Mar 1997	Dec 1996
HCFP	Dec 1995	Dec 1995
HGCP	Nov 1996	Feb 1996
HLCP	Sep 1995	Mar 1995
PCFP	Sep 1995	Aug 1995
SCFP	Aug 1995	Oct 1995
ZCFP	Mar 1996	Nov 1995

General Procurement

First Procurement

ACFP		May 1995
GCFP		Sep 1996
HCFP		Jun 1995
HGCP		Jun 1995
HLCP		Mar 1995
PCFP		Aug 1995
SCFP		Nov 1994
ZCFP		Jun 1995

Last Procurement

ACFP		May 2000
GCFP		Jul 2000
HCFP		Jul 2000
HGCP		Jun 2000
HLCP		Sep 1998
PCFP		Mar 1999
SCFP		Jul 2000
ZCFP		Jul 2000

Completion of Equipment Installation

ACFP	Nov 1998	Jul 1999
GCFP	Dec 1998	May 2002
HCFP	Nov 1998	Jul 1999
HGCP	Dec 1998	Jul 2000
HLCP	Jan 1999	Jan 1999
PCFP	Feb 1999	Dec 1998
SCFP	Jun 1998	Oct 1999
ZCFP	Aug 1998	Jun 1998

Completion of Testing and Commissioning

ACFP	Dec 1998	Mar 1999
GCFP	Aug 1999	May 2002
HCFP	Jun 1998	Dec 1998
HGCP	Apr 2000	Oct 2000
HLCP	Dec 2000	Dec 2000
PCFP	Apr 1999	Mar 1999
SCFP	Dec 1998	Jun 2000
ZCFP	Jun 1998	Jul 1999

Beginning of Start-Up Operations

ACFP	Aug 1998	Aug 1999
GCFP	Oct 1999	Mar 2001
HCFP	Aug 1998	Aug 1999
HGCP	May 2000	Oct 2000
HLCP	Jan 2001	Dec 2001
PCFP	May 1999	Apr 1999
SCFP	Apr 1999	Jun 2000
ZCFP	Aug 1998	Aug 1998

4. Project Performance Report Ratings

Period	Rating	
	Development Objectives	Implementation Progress
Jul–Dec 1998	Satisfactory	Satisfactory
Jan–Jun 1999	Satisfactory	Satisfactory
July–Dec 1999	Satisfactory	Satisfactory
Jan–Jun 2000	Satisfactory	Satisfactory
Jul–Dec 2000	Satisfactory	Satisfactory

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Consultation	27-30 Apr 1992	1	4	a
Follow-Up Consultation	4-10 Aug 1992	2	14	a, i
Follow-Up Consultation	4-6 Nov 1992	4	12	a, d
Fact-Finding	1-19 Feb 1993	8	152	a, b, e, g, i
Appraisal	13-29 Apr 1993	7	119	a, b, c, d
Review	3-23 Apr 1995	1	21	a
Review	12-26 Aug 1996	2	30	a, h
Review	26 May–6 Jun 1997	2	22	a, h
Review	8-18 Sep 1998	2	22	a, h
Review	12-22 Oct 1999	2	22	a, h
Review	22-29 May 2000	2	16	a, h
Special Loan Review	20-21 May 2001	2	4	a, b
Project Completion Review ^b	16 Jun–1 Jul 2002	4	50	a, b, h, i
Project Completion Review	5-9 Aug 2002	1	5	b

^a a = engineer, b = financial analyst, c = counsel, d = economist, e = procurement/consultant specialist, f = control officer, g = programs officer, h = assistant project analyst, i = staff consultant.

^b The Mission comprised C. S. Chin, senior portfolio management specialist and Mission leader; Merlita Pajarillo, energy specialist (financial); Lorna Enjaynes, assistant project analyst; and Zhaohui H. Hwang, staff consultant.



I. PROJECT DESCRIPTION

1. Recognizing the importance of industrialization to the country's economic development, in the early 1950s the Government of the People's Republic of China (PRC) embarked on capital- and energy-intensive industrialization to attain self-sufficiency; however, it did so without due regard to the environment and technology. This resulted in suboptimal levels of production, low efficiency and productivity, inferior product quality, and environmental degradation. The problems of obsolete industrial technology were particularly prevalent in heavy, energy-intensive industries such as the fertilizer industry, where many inefficient, small-scale plants still accounted for a high percentage (more than 60%) of production. Centralized planning, extensive Government intervention in enterprise management, a highly managed trading system, and price controls further contributed to a lack of financial discipline among state-owned enterprises (SOEs) and weakened the link between profitability and efficiency.

2. In the knowledge that efficient and well-managed enterprises in a modernized industrial sector are essential for sustainable economic development and promoting competition in an open economy, the Government is gradually restructuring and modernizing the industrial sector by upgrading outdated industrial plants with state-of-the-art, energy efficient, and environmentally-friendly technology; reforming enterprises; strengthening the market economy; and enforcing environmental regulations. Consistent with the PRC's overall economic development strategy, the Government based its 10-Year Development Program for the Fertilizer Industry (1991–2000) on liberalizing fertilizer pricing and distribution, implementing market-oriented operations, removing barriers to new entrants, and instituting a more transparent trade regime. The program aimed to rationalize large, medium, and small-scale plants; optimize fertilizers' nutrient balance; improve product quality; and add new production capacity. The program envisaged a total investment of about CNY78 billion, of which about 74% was earmarked for nitrogen fertilizer. Of this total amount, about half was intended for renovation at existing sites. About two thirds of the total investment requirements during the Eighth 5-Year Plan period (1991–1995) were to be financed from domestic resources, with the rest (about \$1.1 billion) to be financed by external sources.

3. Recognizing that the investment plan was suitable for meeting the fertilizer sector's development and policy objectives and needs, and given the PRC's strong institutional capacity for project implementation and policy reforms, the Asian Development Bank (ADB) considered a sector loan approach to be appropriate. The Fertilizer Industry Restructuring Project is ADB's first and only policy-based sector lending operation in the PRC, and was designed to support the Government's market-oriented sector reform program for nitrogen fertilizer through a jointly developed action plan for sector reform.¹ The action plan included measures relating to market-determined fertilizer and feedstock pricing, market-responsive distribution systems and regulatory frameworks, import reforms to introduce international competition in fertilizer production, and enterprise reform to encourage commercially-oriented operations in the sector. The Project's primary objective was to support the development of a more efficient nitrogen fertilizer industry. The secondary objectives were to support the Government's energy conservation and environmental improvement programs. The Project was to finance a portion of the time-slice of the investment requirements for projects to renovate nitrogen fertilizer plants initiated during the Eighth 5-Year Plan. This included the following types of subprojects:

- (i) the rehabilitation, replacement, and optimization of medium plants on existing sites; and

¹ The action plan was formulated through small-scale technical assistance: ADB. 1992. *Fertilizer Sector Review*. Manila. (TA 1714-PRC, for \$98,000, approved on 16 June 1992).

- (ii) the conversion of small-scale ammonium bicarbonate plants to produce urea high in nutrients.

4. The scope of the subprojects comprised the following: (i) modifying existing production processes by installing state-of-the-art equipment to improve energy efficiency or optimize plant operations, (ii) providing environmental protection equipment, (iii) providing engineering services, and (iv) providing overseas and domestic training for managerial and technical personnel. Where renovation involved capacity expansion, equivalent capacity was shut down at plants that were unprofitable and could not be economically rehabilitated.

5. The Appraisal Mission selected and appraised three subprojects, namely, the Anyang Chemical Fertilizer Plant (ACFP), the Heilongjiang Chemical Plant (HLCP), and the Pingdingshan Chemical Fertilizer Plant (PCFP). The Ministry of Chemical Industry (MCI), the Executing Agency for the Project, selected and appraised the remaining subprojects based on the following criteria:

- (i) The economic internal rate of return (EIRR) would be at least 12%, while the financial internal rate of return (FIRR) would exceed the respective cost of capital in real terms after tax by at least 2%.
- (ii) The subproject enterprise should be financially sound and should have demonstrated its ability to mobilize the required domestic resources for its investment program and to maintain a debt-service ratio of at least 1.3 and a debt-equity ratio no higher than 70/30.
- (iii) The subproject would result in substantial efficiency gains, with energy efficiency, labor productivity, and/or capital productivity gains of at least 20% for medium plants and 10% for small plants.
- (iv) The subproject would encompass the conversion of all remaining low-nutrient production at the particular enterprise to urea or high-nutrient products.
- (v) The subproject would be able to meet all local and national environmental standards.
- (vi) The subproject enterprise had been accorded substantial managerial autonomy.
- (vii) The selected subproject would be submitted to ADB for approval no later than 31 December 1994.

6. MCI appraised six subprojects from a list of potential nitrogen fertilizer projects included in the Eighth 5-Year Plan and submitted them to ADB for approval before the December 1994 deadline. As the six subprojects met the selection criteria, ADB approved all six in addition to the three subprojects ADB had approved during appraisal. The newly approved six subprojects were the Exi Chemical Fertilizer Plant (ECFP), the Guizhou Chemical Fertilizer Plant (GCFP), the Hechi Chemical Fertilizer Plant (HCFP), the Huainan General Chemical Plant (HGCP), the Shaanxi Chemical Fertilizer Plant (SCFP), and the Zhanyi Chemical Fertilizer Plant (ZCFP). However, ECFP was dropped in 1995 when MCI and ADB realized that the approved loan amount was only sufficient to cover the foreign exchange costs of eight subprojects. These eight subprojects are well distributed among seven provinces. Four are located in the western region, three in the central region, and one in the northeast region.

7. The implementation of the eight subprojects was uneven, with one completed on time and the remaining seven with delays ranging from 8 to 47 months. The loan was closed on 6 October 2000 after the committed loan amount had been fully disbursed, even though some works were still ongoing. A total of \$249.9 million in loan funds was disbursed and \$0.1 million was canceled. The Government started loan repayment on 15 November 1998, and by 15 May 2002 had repaid principal of \$39.5 million. Appendix 1 lists the chronology of major events during project implementation.

I. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

8. Encouraged by the overall improved economic performance brought about by market-oriented reforms, the Government accelerated reforms in the fertilizer sector by means of the 10-Year Development Program for the Fertilizer Industry (1991–2000). The goals of this program were to (i) liberalize fertilizer pricing and distribution; (ii) introduce labor reforms to improve productivity, (iii) reorganize the SOEs toward market-oriented operations; (iv) remove barriers to private investment; and (v) develop a transparent legal and regulatory framework to achieve a more market-oriented, transparent trade regime. Recognizing that successful implementation of the program could have far-reaching impacts on the fertilizer sector, and given that the program is in line with ADB's operational strategy for the industrial sector, which focuses on reducing industrial and urban pollution, improving energy efficiency through clean production, and restructuring SOEs, ADB and the Government agreed on an action plan to reform the fertilizer industry.

9. The sector approach was considered appropriate by the Project Completion Review Mission, as all the subprojects were implemented satisfactorily, albeit with some delay caused mainly by slow mobilization of domestic funds, and the resulting reforms have helped transform the fertilizer sector into a more modern and vibrant one capable of competing in an open economy. While the eligibility criteria were appropriate, the failure of the domestic design institutes to provide accurate cost estimates and realistic demand forecasts contributed to delays in project implementation and the poor financial performance of the project enterprises, and consequently their inability to comply with the debt-service ratio requirement. The inclusion of multiple subobjectives in relation to energy conservation and environmental improvement was practical and cost-effective, as the assisted plants were able to reduce their production costs and increase their capacity while at the same time meeting environmental discharge standards, which is essential for competing in an open economy.

B. Project Outputs

10. The Project ultimately included eight medium-sized fertilizer plants, with a total investment of \$631.3 million, including an ADB loan of \$250 million. At the time of selection all eight plants were already producing ammonia and urea. The Project's scope included constructing new ammonia and urea plants using coal gas as feedstock and implementing an action plan to reform the fertilizer industry. Coal gas was produced either by burning coal in a coal gasification plant or by burning coke; however, HGCP was able to switch from high-cost coal gas to a relatively low-cost coal slurry by building a coal slurry plant using its own funds. This reduced the cost of coal gas production by more than 20% and still allowed HGCP to comply with environmental discharge standards.

11. The new facilities provided under the Project for two of the plants, HGCP and HLCP, can produce 180,000 metric tons per year (mt/yr) of ammonia and 300,000 mt/yr of urea, while the

other six can produce 80,000 mt/yr of ammonia and 130,000 mt/yr of urea. However, with the addition of some processing equipment ACFP managed to safely produce 110,000 mt/yr of ammonia and 190,000 mt/yr of urea. Some of the assisted enterprises subsequently added some processing equipment using their own funds to diversify and produce higher-value chemicals, such as compound fertilizer, argon gas, nitric acid, dimethyl carbonate, and methanol. Others are also planning to switch to cheaper sources of feedstock and to diversify into higher-value chemicals to improve their revenues. The Project helped the PRC increase its nitrogen fertilizer production from 19.8 million mt in 1992 to 24.5 million mt in 2001.

12. The action plan implemented under the Project resulted in the closure of more than 600 inefficient, small fertilizer plants, a switch to market-determined fertilizer and feedstock pricing, and the transformation of the assisted enterprises into limited liability or shareholding companies. In addition, the assisted enterprises' outputs were transformed from low-nutrient fertilizer to high-nutrient urea. The Project has enabled the assisted plants to comply with national and local environmental discharge standards, even though their production capacity has more than doubled. The unit consumption of energy and coal has also been reduced, which has enabled the enterprises to compete more effectively in an open market, although with lower than expected profitability. The successful completion of both the program and the Project has helped modernize and transform a fertilizer industry that was previously characterized by inappropriate feedstock, poor quality products, high energy consumption, and high levels of pollution. The policy reforms resulted in the liberalization of fertilizer marketing and distribution and the establishment and enforcement of fertilizer quality standards. While the assisted plants were able to produce ammonia and urea at their designed capacity levels, the actual production of urea by some plants was lower because of limited demand and the diversion of some of the ammonia produced to make higher-value chemicals. Appendix 2 shows the capacity and actual and projected production volumes for each plant. The following table provides more specific details about outputs and impact of each of the plants.

Table 1: Project Outputs and Impacts

Item	Combined Installed Capacity (mt/yr)		Unit Energy Consumption for Ammonia (GJ/mt)	Reduction in Energy Consumption for Ammonia (%)	Unit Production Cost for Urea (CNY/mt)	Additional Employment (of which female)	Land Acquired (ha)	Compliance With Environmental Standards
	Ammonia	Urea						
ACFP	200,000	330,000	56.8	1.5	806	812 (259)	13.9	Complied
GCFP	160,000	250,000	NA	NA	938	741 (309)	22.3	Assessment not carried out
HCFP	150,000	240,000	53.3	20.5	978	122 (45)	3.2	Complied
HGCP	290,000	425,000	52.2	2.5	818	900 (273)	0.93	Complied
HLCP	235,000	300,000	50.1	5.0	988	821 (246)	0	Complied
PCFP	180,000	300,000	52.3	16.7	979	443 (135)	0	Complied
SCFP	160,000	260,000	50.4	23.4	914	430 (123)	0	Complied
ZCFP	160,000	240,000	51.0	14.1	827	402 (111)	0	Complied

CNY/mt = yuan per metric ton, GJ = gigajoule, ha = hectare, mt/yr = metric tons per year, NA = not available.

13. While the completed project facilities were able to achieve their respective design capacity, their individual annual output was dependent on market demand. Recognizing that flexibility in product mix is essential to compete in a market economy, where price fluctuation and changing demand are the norm, HCFP, HLCP, and PCFP have since used their own funds to diversify their product mix to produce such higher-value products as compound fertilizer, amino benzene, and dimethyl carbonate. The other plants also intend to diversify their product mix in the next few years once they have identified sources of financing.

C. Project Costs

14. The estimated project cost based on the original feasibility studies submitted by MCI was \$576.8 million equivalent, including a foreign exchange cost of \$250 million.² The project cost was subsequently revised during approval by the State Development and Planning Commission in 1995. The revised cost, which excluded ECFP was \$631.3 million equivalent, including a foreign exchange cost of \$250 million. At completion the actual cost was \$791.7 million, which consisted of \$249.9 million in foreign exchange costs and \$541.8 million equivalent in local currency costs, resulting in a cost overrun of \$215 million, or 37.3% more than the approved estimate. The actual foreign exchange cost closely matched the approved estimate that included the unallocated amount and the amount originally allocated to ECFP. If the unallocated loan amount and ECFP's loan amount are excluded from the approved estimate, the actual foreign exchange cost exceeded the estimate by \$32.4 million. The higher local currency cost of \$215.1 million, or 65.8% of the approved estimate, was an outcome of poor cost estimates; failure to include the costs of installation and commissioning; higher than anticipated equipment and civil works costs; unforeseen needs to upgrade some existing common facilities, such as power, steam, and water supply; higher interest rates during construction; and increased land acquisition to ensure better layout of new facilities. The costs of installation and commissioning were originally included in the cost of equipment, as the original intent was that the equipment would be installed and commissioned by the equipment suppliers on the basis of a turnkey contract. However, during the final design stage it was decided by the eight enterprises to engage a separate domestic installation contractor to install all the equipment procured as this was deemed to be more economical. Even though semi-turnkey contracts were subsequently employed, the design institutes failed to provide separate cost estimates for installation and commissioning. The uncommitted loan fund and the loan fund originally allocated to ECFP covered the additional foreign costs, while domestic borrowing financed the local cost overruns. Appendix 3 presents a breakdown of the appraised and approved estimate and actual project costs.

15. In general, the project cost was underestimated during appraisal or when approved by the State Development and Planning Commission. The actual higher cost subsequently contributed significantly to the Project's lower FIRR and EIRR and its inability to comply with the stipulated debt-service ratio. The appraised and actual cost for each plant and reasons for cost difference are provided in the following table.

Table 2: Appraised and Actual Project Costs and Reasons for Cost Difference

Plant	Total Appraised Cost (\$ million)	Total Actual Cost (\$ million)	Difference in Cost (\$ million)	Reasons for the Cost Difference
ACFP	53.5	84.4	30.9	Generally due to poor cost estimate, failure to include costs of installation, and commissioning, higher costs of imported equipment and civil works, and higher interest rates; higher land acquisition costs for ACFP, GCFP, HCFP, PCFP, and SCFP; additional equipment; and unexpected upgrading works on common facilities for ACFP and HLCP.
GCFP	53.0	59.7	6.7	
HCFP	50.9	75.1	24.2	
HGFP	120.1	152.2	32.1	
HLCP	89.4	191.4	102.0	
PCFP	47.4	81.6	34.2	
SCFP	52.3	84.3	32.0	
ZCFP	47.4	62.9	15.5	

16. The original financing plan consisted of a loan of \$250 million from ADB to finance the entire foreign exchange costs. The remaining requirements, all in local currency, were to be

² This estimate included ECFP, and was therefore for nine subprojects.

provided by equity from the enterprises and domestic commercial loans. Of the actual funding \$249.9 million, representing 31.6% of the total project cost, came from the ADB loan; \$379.7 million came from domestic borrowing; and \$162.1 million came from equity contributions from the eight assisted enterprises.

D. Disbursements

17. Disbursements under the ADB loan commenced in December 1994, 5 months after the loan became effective, with an initial payment of \$57,000 to SCFP. The last disbursement was made in October 2000. The loan was closed on 6 October 2000, even though the construction of new ammonia plants by GCFP, HGCP, and SCFP was still ongoing, because all required disbursements under the ADB loan had been made. By the loan closing date disbursements had amounted to \$249.9 million and the remaining unutilized amount of \$0.1 million was canceled. Overall utilization of the ADB loan was close to 100%. Disbursements were made mainly through letters of credit and direct payments. The costs associated with ADB-approved training were paid out of imprest funds maintained by MCI. Contract awards and disbursements were basically in line with projections. Disbursement peaked in 1997 and 1998, when project implementation was at full swing. A comparison table and graph of projected and actual disbursements are shown in Appendix 5.

E. Project Schedule

18. At appraisal the site work was envisaged to commence in 1993 and be physically completed by December 1997, with final disbursements in June 1998. The site work for most subprojects actually started in 1996, more than a year after ADB had approved the second set of subprojects. The site work for GCFP only started in July 1997 because of its inability to mobilize sufficient domestic funds and late approval by the concerned Government authority. The Project was basically completed by December 1999 except for GCFP, whose new ammonia plant was only completed in May 2002 because of a shortage of counterpart funds. Only ZCFP was completed by the original loan closing date. The loan was extended three times for a total of 27 months to enable the remaining seven subprojects to be completed. Four subprojects (ACFP, HCFP, HLCP, and PCFP) were completed during the first extension of one year. In general, all subprojects were completed within the contracted period of 36 or 48 months except for GCFP. Appendix 6 shows the projected and actual implementation schedules.

F. Implementation Arrangements

19. As envisaged at appraisal MCI, through its Foreign Capital Utilization Office, was the Executing Agency for the Project. MCI was responsible for appraising ECFP, GCFP, HCFP, HGCP, SCFP, and ZCFP in addition to overall supervision and coordination of project implementation, including the action plan. MCI was able to provide effective guidance on project implementation and procurement in close coordination with ADB. However, MCI was disbanded in 1998 and most of its staff were transferred to the State Administration of Petroleum and Chemical Industries (SAPCI). This resulted in confusion and unclear delineation of functions and responsibility among the various reconstituted agencies. The Ministry of Finance (MOF) was unable to assist with project monitoring because of staff constraints. Subsequently, ADB had difficulties in obtaining data and information on fertilizer sector reforms and in verifying compliance with loan covenants, including the locations of the small-scale fertilizer plants that had been shut down.

20. Each individual enterprise acted as a project implementing agency (PIA) for its respective subproject. Each enterprise established a project implementation unit under the

direct supervision of its general manager to implement its respective subproject as anticipated. Appendix 7 shows the organization setup of the project implementing units and the individual enterprises. Wherever weaknesses in project implementation were detected by ADB, adequate measures were taken by PIA concerned, including the engagement of domestic supervision firms to assist in project supervision. A domestic procurement agency was engaged by the PIAs to help procure equipment financed under the loan. These arrangements were found to be effective, as implementation was carried out smoothly. Equipment procured generally performed as specified and few persistent problems were encountered, except for initial problems observed during commissioning that were resolved.

G. Conditions and Covenants

21. In general the loan covenants, including policy-related covenants, have been complied with except for the financial loan covenant on the debt-service coverage ratio and more lately, the covenant on submission of audited accounts. The covenant on the debt-equity ratio has been complied with. Policies initiated under the Project, such as market-driven input and output prices, autonomous management and restructuring of assisted enterprises, liberalization of fertilizer marketing and distribution, and establishment and enforcement of fertilizer quality standards were fully implemented. The project enterprises were unable to comply with the covenant on the debt-service coverage ratio because of lower than projected revenues resulting from weak demand and lower prices for the main product, urea, and higher than anticipated capital and production costs. This was also partly due to overstaffing and the enterprises' inability to respond promptly to increased competition and changing market conditions. While all the enterprises have been restructured into limited liability companies and two have even been restructured into shareholding companies, none of them other than SCFP was able to adopt modern management techniques promptly and to pursue aggressive marketing efforts to develop new markets for urea. However, all eight enterprises have implemented or are implementing cost-cutting and revenue enhancement measures to improve their financial performance.

22. From 1995 to 1999 all the project enterprises (except one in 1996 and one in 1998) regularly submitted audited financial statements with an unqualified auditor's opinion for the subprojects, although not always on time. In 2000, however, three enterprises did not submit their audited financial statements, and only one was submitted for 2001. The enterprises were reminded by ADB of the covenant requiring the submission of financial statements. Appendix 8 shows the status of compliance with covenants in the Loan Agreement.

H. Related Technical Assistance

23. The Project was formulated after a detailed fertilizer sector review under a small-scale technical assistance project (see footnote 1). Following this ADB developed a comprehensive policy framework paper based on the Government's industrial reform program and policy initiatives in the fertilizer sector. The Government subsequently confirmed its intent to implement the recommended policy improvements and agreed to set out a time-bound action plan. The policy framework and action plan were well thought out and appropriate for the reform of the fertilizer sector. The nitrogen fertilizer industry has gradually transformed into an industry composed of large and medium fertilizer plants, which conserve more energy and are more environmentally friendly than small plants. More than 60% of nitrogen fertilizer is currently produced by large and medium fertilizer plants, an achievement that can partly be attributed to the success of the program. The technical assistance is rated as successful.

I. Consultant Recruitment and Procurement

24. International engineering contractors were engaged through international competitive bidding procedures to provide urea process licenses. Using its own funds each PIA engaged one or two domestic design institutes to help prepare preliminary and detailed designs and feasibility studies. In addition, the PIAs of HCFP and PCFP engaged domestic supervision firms to supervise project implementation and subsequent commissioning of the project facilities at their own expense. For procurement involving international competitive bidding and international shopping, a domestic procurement agency was engaged to draft bid documents and to assist with bid evaluation and subsequent contract management. Other than poor cost estimates, the services the domestic design institutes and procurement agency provided were generally satisfactory except for HLCP, where insufficient provision of piping led to costly replacements to achieve optimum flow. HLCP has been negotiating with the design institute for reimbursement of the replacement costs. The use of domestic design institutes, domestic supervision firms and a domestic procurement agency were appropriate, as the PIAs were unfamiliar with ADB's *Guidelines for Procurement* and had limited knowledge of new technology for urea production.

25. All ADB-financed equipment was procured in accordance with ADB's *Guidelines for Procurement*. All equipment with a contract value of \$500,000 or more was procured following international competitive bidding procedures, while equipment with a value below \$500,000 but not less than \$50,000 was procured using international shopping procedures. The exception was a sludge dewatering press valued at \$71,478 for which ADB approved the use of direct purchase mode. Some spare parts, special tools, and overseas training where contracts were within the \$50,000 ceiling were procured following direct purchase procedures. While commenting that the guidelines were time consuming and cumbersome, all the PIAs agreed that complying with them ensured the procurement of the most suitable equipment at competitive prices. The substantial increase in projected costs for each subproject was due to unrealistic cost estimates during feasibility studies. However, the foreign exchange costs were contained within the approved loan amount by deleting the ECFP subproject and distributing its allocated loan funds across the eight remaining subprojects. Appendix 9 shows the contracts financed by ADB.

J. Performance of Consultants, Contractors, and Suppliers

26. The domestic design institutes were able to provide appropriate preliminary designs in a timely manner to ensure prompt engagement of the international engineering firm for process licenses. However, in the selection of coal gasification technology for ammonia plants, the design institutes emphasized the reliability of the new technology based on fixed bed gasification plants instead of the use of cheaper coal from the locality. As a result, the enterprises have to buy more expensive coal for feedstock from other provinces because local coal, though available in large quantities, is unsuitable in most cases (except for ACFP) for the type of fixed bed oven used. This is one of the reasons for the higher than anticipated cost of ammonia production, even though the enterprises adopted a more efficient technology in terms of the process. In addition, the cost estimates the design institutes provided in their feasibility studies were grossly inadequate, resulting in substantial cost overruns and the subsequent worsening of the project enterprises' financial performance. However, all PIAs with the exception of HLCP were satisfied with the performance of the design institutes. While the new facilities were generally able to meet the design requirements and seven of the PIAs were satisfied with their services, the performance of the domestic design institutes was rated as partly satisfactory because of their failure to provide reasonable cost estimates and realistic forecasts of the demand for urea. The failure to take the availability of cheaper local coal into

account when selecting gasification technology also lowered their overall rating. Domestic consultants recruited for project supervision were effective in ensuring good quality work at project sites and in minimizing problems encountered during commissioning. Their performance was rated as satisfactory.

27. The civil work and equipment installation contractors engaged were competent and were selected based on local competitive bidding. They were able to complete their respective assignments on time and in a satisfactory manner. Their workmanship was generally good. The performance of equipment suppliers was also generally satisfactory, as all problems noted during commissioning were duly rectified except for the premature failure of compressors, insulation bricks, and boiler tubes of boilers at HLCP, which were still being attended to by the suppliers. In most cases commercial production commenced immediately after commissioning.

K. Performance of the Borrower and the Executing Agency

28. The performance of the Borrower, initially through the People's Bank of China and later through MOF, was generally satisfactory. The Borrower completed the requirements for loan effectiveness in a timely manner. However, MOF could not provide effective monitoring because of staff constraints and unfamiliarity with the rationale for and formulation of the Project despite receiving regular briefings from ADB review missions. Nevertheless, during the Project Completion Review Mission an MOF official met with representatives of all the enterprises to express the ministry's concern about the financial sustainability of the subprojects and to review the performance of and actions being taken by the individual companies to improve their profitability and financial performance.

29. The performance of MCI was considered partially satisfactory. MCI was actively involved in selecting the subprojects and monitoring project implementation, and provided effective guidance on ADB procurement and policies. MCI also managed the centralized imprest fund for training-related expenditures effectively. The imprest account was well kept, although the liquidation of imprest funds was slow. However, MCI was disbanded in 1998 and most of its staff was assigned to the newly created SAPCI. Even though SAPCI's project director continued to be responsible for the Project until completion, the personnel previously involved in the project were no longer active in monitoring and in ensuring full compliance with the loan covenants. Confusion was apparent in relation to which agency should continue to monitor the policy environment and new developments in the fertilizer sector. The difficulties were compounded by the lack of clear-cut direction from the Government as to which agency the fertilizer enterprises should report to. In addition, because of MCI's closure, the status of those small-scale fertilizer plants that had been shut-down, including the welfare of their employees, could not be verified; however, SAPCI staff assured the Mission that these employees had either taken early retirement or had been redeployed to other firms.

30. The performance of the eight PIAs was satisfactory, and project implementation was carried out in a systematic manner. The experience gained and knowledge acquired by PIA staff allowed them to operate the new facilities in a more professional manner than before and provided them with the confidence to explore new alternatives for diversifying their product mix and enhancing their revenues. This was accomplished through joint review of design and technical specifications with international engineering contractors and domestic consulting firms and hands-on experience through actual project implementation, reinforced by the training provided under the Project. The technology adopted for the ammonia and urea plants is technically and commercially sound and well-trained staff are in place to operate the new facilities competently. The new facilities were observed to be generally operating as designed. Indeed, ACFP's new facilities are operating at higher than the rated capacity. All initial technical

problems encountered during commissioning were either rectified in-house or with the assistance of suppliers and engineering supervisory firms. However, implementation delays were encountered in seven subprojects, mainly because of late start-up and lack of domestic funds, particularly in the case of GCFP, where the lack of counterpart funding delayed construction of the new ammonia plant by almost four years. In hindsight, these delays could have been avoided by having counterpart funding arrangements in place before subprojects were approved for inclusion in the Project.

31. Communication with ADB was infrequent and turnaround time for responding to ADB requests was generally slow. Most enterprises submitted audited financial statements with an unqualified auditor's opinion regularly, although not always on time. ACFP did not submit audited financial statements for 1996; HCFP did not submit audited financial statements for 1998; HCFP, HGFP, and SCFP did not submit audited financial statements for 2000; and only GCFP has submitted audited financial statements for 2001. The submission of quarterly progress reports and benefit monitoring and evaluation reports was irregular. The subprojects' financial sustainability in the face of globalization and free trade remains a major concern that MOF and the PIAs should address. However, the financial performance of these eight enterprises should improve given the expected improvement in the price of urea, as projected by the World Bank; the ongoing investments in new facilities to diversify into higher-value products over the next few years; the implementation of cost-cutting measures; and the ongoing negotiations to convert domestic debt to equity.

L. Performance of ADB

32. ADB's performance in completing the Project was generally satisfactory despite the frequent changes in ADB administration units. ADB made considerable efforts to monitor the implementation of the Project through regular project review missions and frequent consultation with MCI. During the 6-year implementation period ADB fielded seven missions and spent adequate time reviewing physical progress and resolving outstanding implementation issues with MCI and PIA staff. ADB took immediate action to cancel the ECFP subproject and reallocate the remaining loan fund when ADB staff realized that the loan fund was only sufficient to cover the foreign exchange costs of eight subprojects. MCI and the eight PIAs expressed their full satisfaction with ADB and the assistance rendered by the missions. ADB and MCI jointly organized three discussion group meetings to exchange ideas and share project implementation experience. These were extremely useful in helping the PIAs resolve similar implementation problems. A workshop chaired by a senior MOF official and attended by representatives of the eight assisted enterprises was held at ADB's Resident Mission in Beijing subsequent to the PCR Mission to exchange experience and explore options for reducing production costs and diversifying into higher-value products.

II. EVALUATION OF PERFORMANCE

A. Relevance

33. The Project was consistent with ADB's and the Government's priorities at the time of appraisal, and continues to remain relevant and consistent with current priorities. The Project's initial performance indicates that it has achieved its objective of promoting the development of a market-oriented and efficient nitrogen fertilizer industry and strengthening the pace of economic reforms. The Project has benefited farmers, who account for the biggest portion of the poor in the PRC, by providing chemical fertilizer of more consistent quality and with more nutrients at a more competitive price. The Project was designed to enable the assisted enterprises to compete more effectively in a global economy. This ability will be further strengthened by

substituting cheaper feedstock; diversifying the chemical product mix; and expanding the distribution network, including exporting to neighboring countries. The improved technical skills acquired through overseas training and the adoption of modern technology helped ensure that the project facilities could be operated more efficiently. The Project was assessed to be relevant.

B. Efficacy in Achievement of Purpose

34. The eight selected subprojects were all medium-sized fertilizer plants producing 55,000 mt/yr to 110,000 mt/yr of ammonia and 110,000 mt/yr to 170,000 mt/yr of urea using obsolete and inefficient manufacturing processes. The new ammonia and urea facilities provided under the Project can produce 80,000 mt/yr of ammonia and 130,000 mt/yr of urea, except for HGCP and HLCP, which can produce 180,000 mt/yr of ammonia and 300,000 mt/yr of urea. In addition, ACFP invested in additional equipment to further expand the capacity of the project facilities to produce 110,000 mt/yr of ammonia and 180,000 mt/yr of urea. While production by the eight assisted enterprises increased in net terms, this was negated by the closure of more than 600 inefficient, small fertilizer plants during the same period. In 2001 the eight enterprises combined produced about 1.22 million mt of urea, which was lower than their capacity of 1.44 million mt because of weak demand (see Appendix 2). The project facilities reduced energy consumption for ammonia and urea production by an average of 11.8% and 9.4%, respectively, compared with the old facilities. Air and wastewater discharges can meet national and local discharge standards as verified by independent environmental experts. However, the depressed market price for urea after the Project came on stream has reduced the Project's benefits.

35. All eight assisted enterprises have been restructured into limited liability companies. Two of the enterprises were further restructured into shareholding companies with their shares listed on the domestic stock market. Appropriate training courses have been conducted to strengthen the enterprises' institutional capability in general and financial management and to improve their accounting systems; however, further training is needed to bring management and accounting standards in line with international practices. Each enterprise is responsible for its own profits and losses and enjoys full decision making autonomy.

36. Input and output prices have been completely liberalized and are subject to full market forces. Fertilizers and other chemicals produced can be freely sold in the market and compete openly with imported fertilizer. A portion of the fertilizer produced was exported to other countries. Quality standards have been established and enforced for urea. The Project was assessed to be efficacious.

C. Efficiency in Achievement of Outputs and Purpose

37. Although most of the subprojects were completed later than planned, project implementation was smooth, and construction and installation of the project facilities were successfully completed within the contracted construction period. All project facilities were able to reach design capacity within a year of being commissioned; however, all the subprojects missed the opportunity to take advantage of the high urea prices prevailing in 1996, which would have enabled the enterprises to generate higher revenues and provide the funds required for additional investments to improve their financial performance. The price of urea has declined since 1997, and the current price is only about 70% of that in 1996. Urea prices dropped below production costs on a number of occasions, which prompted PCFP to stop producing urea for a considerable period during 2001. A few enterprises took the opportunity to diversify their products to produce higher-value chemicals such as compound fertilizer and methanol to

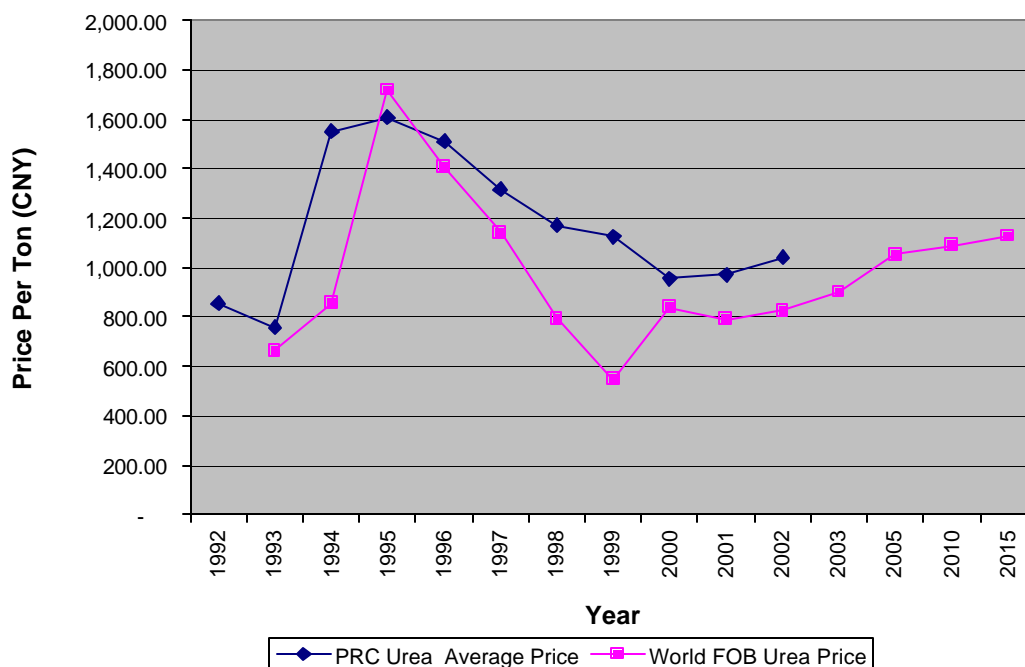
sustain their operations. Given the delay in project implementation that meant the enterprises missed the opportunity to take advantage of the peak urea price, their poor financial performance, and their inability to respond promptly to changing market circumstances the Project was rated as less efficient in achieving its purpose.

1. Financial Performance

38. The financial performance of the eight enterprises has been less than satisfactory, as their profitability for the past five years, even after the project facilities came on-stream, has been negative or marginal. The financial projections prepared for the next 10 years show that the income level of some of the enterprises will be insufficient to cover their debt service requirements, and thus they will have to rely on continued support from provincial governments in the medium term. This would, however, be mitigated in the long run if the price of urea increases, as projected by the World Bank, and if the enterprises successfully implement various ongoing and planned measures to reduce production costs and diversify into higher-value products.

39. Six of the enterprises have not been making principal repayments from internally generated funds since repayment started in November 1998, but have relied on their respective provincial governments to honor their repayment obligations. All eight enterprises are currently implementing measures to improve their profitability, including adopting such cost-cutting measures as reducing their overheads, streamlining their staff, and optimizing their plant capacity. They have also initiated concrete steps to diversify their products through additional investments to produce higher value added chemical products using ammonia and urea as intermediate feedstock. While the proposed new products enjoy strong demand and higher prices at the moment, none of these enterprises has prepared feasibility studies for the new investments to confirm their financial viability and determine the least cost option for process modification. This holds true for the plan to modify existing production processes to use cheaper coal slurry to bring down production costs. The enterprises have asked MOF for assistance in sourcing their funding requirements, as these additional investments could be crucial to enhance the viability of their operations. The enterprises are also negotiating with domestic banks to convert some or all of their domestic loans to equity. Appendix 10 summarizes the financial performance of the eight subprojects.

40. The FIRR for each subproject was reevaluated on the basis of its actual financial performance up to 2001 and the financial projections based on data provided by the respective enterprises. Capital costs were based on actual expenditures incurred for the subprojects. Planned immediate investments to reconfigure the product mix of some of the enterprises were considered. Incremental revenues were based on incremental sales. Projected revenues take into account the production of higher-value products and 3% annual growth in the price of urea from 2002–2005. The level of actual operating and maintenance costs was maintained. Revenues and expenses were maintained in 2001 price terms. The reevaluated FIRR of the three subprojects evaluated by ADB at appraisal was lower than the appraisal estimate, while the FIRR of the remaining five subprojects was also relatively low except for HCFP and ZCFP. The lower FIRR is basically due to the combined effect of higher feedstock prices (about 20% higher than the appraisal estimate), higher investment costs (37% higher than the appraisal estimate), and lower than projected selling prices for urea as shown in Figure 1 (about 30% lower than the appraisal estimate). The prices of coal and coke, which are the main feedstock for the ammonia plants with the exception of HGCP (which depends on cheaper coal slurry), have increased substantially because of the closure of about 600 inefficient, small coal mines and the removal of Government price subsidies.

Figure 1: Actual and Projected Urea Prices, 1992–2015

FOB = free on board.

Source: PRC average price for urea: SAPCI. 2001. *Fertilizer Handbook*. PRC; World FOB urea price: World Bank. 2001. *Global Development Finance*. Washington, DC.

41. The lower urea price was caused by the increase in fertilizer production from 8.75 million tons in 1995 to 14.12 million tons in 2000 and a drop in demand from a peak of 15.5 million tons in 1996 to 6.3 million tons in 2000. The drop in demand was due to the curtailment of grain production because of an ongoing glut and the Government's decision to restore some marginal farmland to forest and grassland to improve the environment. However, both the domestic and international prices of urea have picked up since 2001. The World Bank anticipates that the international price of urea will continue to improve in the future. Such an improvement, coupled with the diversification of product mix by most of the enterprises, should improve their financial health. The reevaluated FIRR based on past and projected urea prices and proposed product mixes are still higher than the weighted average cost of capital (WACC) for the eight subprojects except HLCP. However, the FIRR for HGCP and SCFP do not exceed the WACC by at least 2% as required in the appraisal. Nevertheless, the overall FIRR for the Project is 3% higher than the overall WACC. Table 3 summarizes the FIRR and the WACC at appraisal and as reevaluated at project completion review. Details are shown in Appendix 11.

Table 3: Recalculated FIRR and WACC

Subproject	FIRR at Appraisal (%)	FIRR at PCR (%)	WACC at Appraisal (%)	WACC at PCR (%)
ACFP	14.8	8.6	9.5	5.4
GCFP	—	6.6	—	4.3
HCFP	22.9	11.6	9.0	6.0
HGCP	—	7.6	—	6.5
HLCP	—	5.4	—	5.8
PCFP	23.9	9.9	6.3	5.4
SCFP	—	6.6	—	6.2
ZCFP	—	11.6	—	5.4
Whole Project	—	8.8	—	5.8

2. Economic Performance

42. The economic performance of the individual subprojects was reevaluated following the methodology used in the appraisal. Incremental costs and benefits were determined for each subproject based on the results of a comparison of the with project and without project scenarios to determine the net benefit stream. The economic life of the subprojects, assumed at appraisal to be 16 years, was maintained. The residual value was assumed to be zero at the end of the economic life. All costs and benefits were expressed in 2001 constant prices. The economic benefits were derived from the sales of urea and other by-products. The border price for urea plus transportation and handling costs to the subproject site was used. A discount of 5% was applied to account for the lower quality of indigenous urea compared with imported urea. The benefits derived from other by-products were calculated from their financial values by applying standard conversion factors. The financial costs of nontradable items were converted to their economic values using conversion factors.³ Imported equipment was valued at its international price plus transport and handling costs from the port to the project site, and local equipment was converted into economic border prices by applying the appropriate conversion factor. The price of coal was expressed in cost, insurance, and freight price to the project site. For other cost components financial costs were converted using the standard conversion factor. Taxes, import duties, and all financial charges, including interest during construction, have been excluded.

43. Table 4 shows the recalculated EIRRs of the subprojects compared with appraisal. Details of the calculations are shown in Appendix 12.

Table 4: Recalculated EIRR

Subproject	EIRR at Appraisal (%)	EIRR at PCR (%)
ACFP	14.3	13.6
GCFP	21.3	10.9
HCFP	18.8	14.7
HGCP	12.8	14.4
HLCP	15.3	10.5
PCFP	17.2	15.2
SCFP	18.1	10.3
ZCFP	22.7	13.9
Whole Project	—	12.5

44. The reevaluated EIRR for all subprojects was lower than the appraisal estimate with the exception of HGCP. The lower EIRRs are due to higher capital costs, lower benefits, and higher operating costs than originally anticipated at appraisal. The higher reevaluated EIRR for HGCP is due to better benefits. The reevaluated EIRR for the Project is 12.5%, which is higher than the economic opportunity cost of capital of 12%.

D. Preliminary Assessment of Sustainability

45. While the financial performance of the eight assisted enterprises is currently weak, their performance is expected to improve slightly given the recent increase in the price of urea, which is projected to be maintained or to improve further in the next several years. In addition, the ongoing conversion of some domestic debts into equity would enable the enterprises to invest in new technology and equipment that could bring down production costs and allow them to develop new products. Also the eight enterprises have been restructured into limited liability or shareholding companies and have been exposed to some modern management practices by

³ The conversion factors used in this evaluation are 1.1 for civil works, 1.1 for local machinery, and 0.93 for others.

means of project implementation and overseas training. Continued improvement in urea prices coupled with the ongoing and planned investments to switch to lower cost feedstock and diversify to higher-value products would improve the Project's sustainability. Until these measures have been fully and successfully implemented, the sustainability of the Project is rated as less likely.

E. Environmental, Sociocultural, and Other Impacts

3. Environmental Impact

46. An environmental impact assessment report was prepared for each subproject in accordance with the PRC's Environmental Protection Law and Environmental Management Guidelines for Construction Projects and was approved by the State Environmental Protection Agency and local environmental protection bureaus. The Borrower prepared the summary environmental impact assessments for the first three subprojects, and these were circulated to the Board on 31 March 1993. The reports and summary reports for the other five selected subprojects were submitted to ADB for approval along with the feasibility studies. Mitigating measures recommended in the summary environmental impact assessments were carried out during project implementation. Pollution control devices were incorporated in the design and cleaner production technology was selected to ensure minimum pollution. In addition, each enterprise had allocated some funds (about 6% of the total project cost as shown in Appendix 13) for improvements to their existing plants, such as installing electrostatic precipitators and wastewater treatment plants and recovering sulfur and waste gases. A panel of experts that included environmental specialists conducted independent assessments of environment compliance during performance evaluation of the subprojects in 2001–2002 except for GCFP's ammonia plant, which was still being commissioned. All the ammonia and urea plants provided under the Project were able to pass environmental standards for chemical industries. As GCFP's ammonia plant is based on the same technology, the enterprise is confident that performance evaluation by an independent team of experts scheduled for early 2003 will find that its new facility can comply with environmental standards.

47. The project facilities, which are more energy-efficient and based on cleaner production technology than before the Project, consume an average of about 11.8% less energy per ton of ammonia produced and 9.5% less energy per ton of urea produced. The new facilities meet national and local environmental discharge standards as confirmed by the independent panel of experts during performance assessment of the project facilities. The reduction in coal consumption and pollution discharges has benefited plant workers as well as nearby residents. Urea produced by the project facilities is of grade I quality and contains more nutrients than ammonia bicarbonate, which helps farmers to improve their agricultural yields. The low prevailing price for urea also helped farmers reduce their input costs. The farmers near SCFP further benefited from the enterprise's research undertaken on the correct application and dosage of its urea. This also helped to reduce fertilizer wastage and prevent excessive fertilizer applications from polluting the surface water. The overall institutional development impact was considered generally moderate.

2. Social Impact

48. Land acquisition was kept to a minimum, as most enterprises were able to use land they already owned to construct the project facilities. Where land acquisition was necessary, the enterprises acquired farmland or vacant land and provided adequate compensation. About 53.8 ha of farmland and vacant land and a small residential lot were acquired at a total cost of about CNY82.4 million. About 26 households totaling 180 people located on the residential lot

purchased by GCFP were resettled in nearby houses that are superior to their previous dwellings. In addition, temporary employment of about 2,450 person-years was created during project implementation, and about 20% of those employed were female. The project facilities created permanent employment for 4,671 people through additional employment and employee redeployment after restructuring, 32% of which were female. The technical training, both overseas and local, enhanced the enterprises' ability to operate and maintain the project facilities in a more systematic and efficient manner, thereby minimizing downtime that could adversely affect productivity. The productivity in the assisted enterprises has increased from about 900 tons of urea per worker per year to about 1,260 tons. The management training conducted within the PRC helped the enterprises improve their organizational structure and facilitated effective delegation of authority.

3. Capacity Building

49. The Project provided a total of 34,794 person-hours of overseas and domestic training on efficient and effective operations and maintenance of the project facilities to 2,269 staff, as detailed in Appendix 14. Project implementation has enabled senior management staff involved to acquire new working knowledge of management techniques for effective project planning and implementation and exposed them to new state-of-the-art technology and automated control systems. ADB training in procurement and project benefit monitoring and evaluation has strengthened their financial management capabilities and improved their confidence in conducting international competitive bidding and developing cost-cutting measures. The training will eventually equip the enterprises to compete more aggressively in a global economy; however, senior management and accounting staff need further training to bring their management and accounting standards on a par with international practices.

4. Enterprise Reforms

50. All eight project enterprises have been restructured into limited liability companies with full enterprise autonomy. Two of the enterprises were further restructured into shareholding companies with their shares listed on the domestic stock market. The enterprises became more responsive to market forces by diversifying their product mix to meet new market demand and have developed some product research and development capabilities to enhance their market share.

5. Policy Reforms

51. Both input and output pricing and distribution have been completely liberalized and barriers to private investment have largely been eliminated. Fertilizer imports are now governed by tariffs, and the legal framework in relation to imports has been strengthened with the passage and revision of various laws in compliance with World Trade Organization requirements to facilitate free trade and private sector development. Standards for producing chemical products such as urea have been established. Some of the enterprises were able to export a portion of the chemicals produced. Inefficient and obsolete plants are being closed down through a combination of strict enforcement of environmental laws and market forces. The China National Agricultural Means of Production Group Corporation is no longer involved in distributing and marketing fertilizer. The policy reforms covenants were adhered to (Appendix 8).

III. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

52. The objective of developing a more efficient and market-oriented nitrogen fertilizer industry has been met. More than 600 small and inefficient fertilizer plants have been shut down and more than 60% of the urea fertilizer currently produced is now manufactured by medium and large fertilizer plants which are more efficient and cleaner. The secondary objectives of energy and environmental improvements have also been met, as the assisted projects were able to reduce their energy consumption by an average of 21.2% in addition to meeting national standards for air and wastewater discharges as recently confirmed by independent experts. However, the financial performance of the assisted enterprises has not improved because of the combined effects of higher input prices, higher capital costs, and lower urea prices. However, in 2001 the price of urea showed signs of improvement, and the indications are that it will continue to improve for the next several years. The Government recently decreed that methanol produced from corn will replace costly petroleum in the vehicle fleet in general starting with Henan province. Once this pioneer scheme has proven to be beneficial to the economy, the Government is likely to extend it to the rest of the country. This would call for increased production of corn and hence, increased use of fertilizer. Should this scheme materialize in addition to the expected higher urea prices and the cost-cutting measures being implemented or to be implemented shortly, the enterprises' financial performance can be expected to improve.

53. The Project is rated as partly successful based on criteria of relevance, efficacy, efficiency, sustainability, and institutional development and other impacts.⁴ As the Project entails various cost-cutting and profit enhancement measures, a Project Performance Audit will have to be carried out to review the project ratings again after the successful implementation of these measures.

B. Lessons Learned

54. While the primary and secondary objectives were largely met, the financial performance of the assisted enterprises has not improved and the reevaluated FIRR (and EIRR) is lower than appraisal estimates. This has made all the assisted enterprises virtually dependent on Government financial assistance to fulfill their loan repayment obligations. Historical data on the price of urea has shown a downward trend from 1980 to the end of 1993, with a slight upward movement at the time of appraisal, and World Bank projections prepared at that time also showed a steady downward trend in the price of urea. Thus the projected urea price of CNY1,700 per mt for estimating the FIRR at appraisal was overly optimistic. The fertilizer enterprises' assessment of market risk in an open economy was grossly inadequate, particularly with respect to the likely impact of price deregulation and changes in farm practices on the subprojects' financial viability. In hindsight, a more conservative approach should have been used to estimate demand for urea.

55. Design for industrial projects in an open economy should incorporate flexibility in feedstock and product mix to the extent possible, so that projects can take advantage of changing market conditions to switch to cheaper feedstock and produce higher value-added products. A subproject manufacturing a single product under rapidly changing conditions may

⁴ This Project Completion Report is a part of a sample of about 50% of all project completion reports prepared in 2002 that were independently reviewed by the Operations Evaluation Department. The review has validated the methodology used and the ratings given.

have difficulty sustaining its operation if the projected demand for and/or price of its product are not realized.

56. The delay in project start-up and implementation was due mainly to a shortage of domestic funds, compounded by the increase in project costs. To ensure timely project implementation all required funding should be confirmed upfront and contingent arrangements made for cost overruns.

57. The gross underestimation of project costs during appraisal resulted in the subsequent deletion of an approved subproject, which along with difficulties in mobilizing additional domestic funds reduced the Project's financial and economic viability. Cost estimates prepared by borrowers, particularly for new technology, should be verified for accuracy through cross-checking with similar projects in other developing member countries or by a short-term international expert.

58. The monitoring of reforms and compliance with loan covenants became difficult after the disbanding of MCI. In hindsight, senior Government officials should have been alerted to the need to ensure that stipulated commitments and obligations were fully honored when this unanticipated reorganization took place.

C. Recommendations

1. Project-Related

59. The main problems confronting the eight enterprises are comparatively high production costs and heavy debt-service requirements. Cost-cutting measures, including eliminating excess workers and adopting modern management practices, must be adopted immediately. In addition, ACFP, GCFP, SCFP, and ZCFP should examine the feasibility of switching their feedstock to cheaper local coal for their coal gasification plants and of further diversifying into higher-value products. All eight plants should immediately pursue the conversion of debt to equity with domestic lenders to reduce their debt servicing burdens. They should also develop and extend their after sales service to help farmers apply fertilizer correctly in order to retain loyal customers.

60. Starting in 2003 the eight enterprises should submit project benefit monitoring and evaluation reports and audited financial statements each year for five years to allow ADB to monitor the financial performance of the respective enterprises.

61. The Operations Evaluation Department should prepare the Project Performance Audit Report for the Project in 2004 or later. By that time the cost-cutting measures and further investments to diversify feedstock and product mix will have been completed and will be fully operational, and sufficient data to reassess the financial performance of the eight enterprises and the project rating will have become available.

2. General

62. For industrial projects in an open economy, the Fact-Finding Mission should carry out risk analysis prior to the investment decision, particularly now that the PRC is a member of the World Trade Organization. Officials of the targeted enterprise must be trained in risk management and corporate governance practices to facilitate timely and effective responses to changes in market conditions. If these are found lacking, sufficient loan funds must be allocated for human resource development.

MAJOR EVENTS DURING PROJECT IMPLEMENTATION

27–30 Apr 1992	Consultation Mission
4–10 Aug 1992	Follow-Up Consultation
16 Jun 1992	Approval of TA 1714-PRC: Fertilizer Sector Review, for \$98,000
4–6 Nov 1992	Follow-Up Consultation Mission
1–19 Feb 1993	Fact Finding Mission
Mar 1993	Receipt of report from staff consultants
1 Apr 1993	Recruitment of staff consultant to assist in the Appraisal Mission
2 Apr 1993	Management Review Meeting, approval of advance procurement action
13–29 Apr 1993	Appraisal Mission including appraisal of three subprojects. Anyang Chemical Fertilizer Plant (ACFP), Heilongjiang Chemical Plant (HLCP), and Pingdingshan Chemical Fertilizer Plant (PCFP)
12 May 1993	Receipt of estimated costs and details of six subprojects proposed for inclusion in the Project
31 May 1993	Receipt of additional details on the six subprojects
8 Jun 1993	Staff Review Committee meeting
22 Jun 1993	Loan and Technical Assistance Coordination Committee meeting
21–22 Jul 1993	Loan negotiations
24 Aug 1993	Loan approval for \$250 million
18–30 Oct 1993	Inception Mission
26 Apr 1994	Loan Agreement signed
14 Jul 1994	Loan became effective
18 Oct 1994	Approval of the four additional subprojects: Guizhou Chemical Fertilizer Plant (GCFP), Hechi Chemical Fertilizer Plant (HCFP), Shaanxi Chemical Fertilizer Plant (SCFP), and Zhanyi Chemical Fertilizer Plant (ZCFP)
24 Oct 1994	Notice of approval of the four additional subprojects sent to the Borrower
19 Dec 1994	Approval of the two additional subprojects: Huainan General Chemical Plant (HGCP), and Exi Chemical Fertilizer Plan (ECFP)
19 Jan 1995	Notice of approval of the two additional subprojects sent to the Borrower

15 Feb 1995	Approval of bid documents for the procurement of urea plants
3–23 Apr 1995	First Review Mission
3–16 May 1995	Advertisement of notice for procurement of urea plants
20 Jun 1995	Asian Development Bank (ADB) approval of the establishment of an imprest fund
25 Jun 1996	ADB approval of the purchase of computers for HCFP, SCFP, and ZCFP
12–26 Aug 1996	Second Review Mission
28 Aug 1996	Receipt of the Ministry of Chemical Industry's request to cancel the ECFP subproject and reallocate loan proceeds
17 Sep 1996	Cancellation of ECFP subproject and reallocation of loan proceeds
15 Oct 1996	Reallocation of loan proceeds to include interest during construction and contingency per subproject
26 May–6 Jun 1997	Third Review Mission
27 Jun 1997	First extension of loan closing date from 30 June 1998 to 20 June 1999
21 Jul 1997	Reallocation of loan proceeds from contingency to ACFP, HLCP, and PCFP
17 Dec 1997	Reallocation of loan proceeds from contingency to GCFFP, HCFP, HGCP, SCFP, and ZCPF
8–18 Sep 1998	Fourth Review Mission
28 Jan 1999	Second extension of loan closing date from 30 June 1999 to 31 December 1999
2–10 Aug 1999	Visit of representatives from the eight enterprises to ADB headquarters to discuss Project Completion Report preparation and actions needed on benefits and monitoring and evaluation, including data collection
12–22 Oct 1999	Fifth Review Mission
7 Dec 1999	Third and final extension of loan closing date from 31 December 1999 to 30 June 2000
6 Oct 1999	Closing of loan account
22–29 May 2000	Special Loan Review Mission.
16 Jun–1 Jul 2002	Project Completion Review
5–8 Aug 2002	Follow-Up Project Completion Review

CAPACITY, PRODUCTION VOLUMES, AND BY-PRODUCTS

Table A2.1: Capacity and Actual Production, 2000 and 2001
(metric tons)

Plant	Capacity ^a		Actual Production			
			2000		2001	
	Ammonia	Urea	Ammonia	Urea	Ammonia	Urea
ACFP	110,000	190,000		185,304		187,471
GCFP	80,000	130,000	88,189	107,918	66,762	66,444
HCFP	80,000	130,000		123,340		123,989
HGCP	180,000	300,000		55,650		286,911
HLCP	180,000	300,000		94,118		200,012
PCFP	80,000	130,000		126,024		80,831 ^b
SCFP	80,000	130,000	15,000	73,292		134,795
ZCFP	80,000	130,000		121,157		139,730

^a Capacity of ADB-funded facilities. Capacity is not additive. Urea is the final product. Ammonia is only an intermediate product, but may be sold as is.

^b Curtailed production volume due to low market demand.

Table A2.2: Projected Production, 2002–2005
(metric tons)

Plant	2002		2003		2004		2005	
	Ammonia	Urea	Ammonia	Urea	Ammonia	Urea	Ammonia	Urea
ACFP		200,000		200,000		200,000		200,000
GCFP	40,000	65,000	40,000	65,000	40,000	65,000	40,000	65,000
HCFP		135,454		135,454		258,736 ^a		203,000 ^b
HGCP		300,000		300,000		300,000		300,000
HLCP		280,000		280,000		280,000		280,000
PCFP		126,000		126,000		126,000		126,000
SCFP		140,000		140,000		140,000		140,000
ZCFP		139,730		139,730		139,730		139,730

^a Additional investments will be made in 2003 and 2004 to increase urea production.

^b Part of the urea production will be converted to compound fertilizer.

Table A2.3: By-Products by Plant

Plant	By-products
ACFP	Recovered ammonia solution, methanol, carbon dioxide and oxygen. Amino benzene and dimethyl carbonate will be added starting in 2003.
GCFP	Methanol will be added starting in 2003.
HCFP	Compound fertilizer will be added starting in 2005.
HGCP	Liquified oxygen, nitric acid, and dimethyl carbonate. Liquified argon will be added starting in 2003.
HLCP	Methanol and argon gas. Compound fertilizer and dimethyl carbonate will be added starting in 2003.
PCFP	Argon gas. Methanol and compound fertilizer will be added starting in 2003.
SCFP	Waste coal, carbon dioxide, nitrogen dioxide, oxygen, and sulfur.
ZCFP	Ammonium chloride and sodium carbonate.

APPRAISED AND ACTUAL COSTS
(\$ million)

Component	Anyang Chemical Fertilizer Plant						Guizhou Chemical Fertilizer Plant					
	Appraised			Actual			Appraised			Actual		
	FX	LC	Total	FX	LC	Total	FX	LC	Total	FX	LC	Total
Land Acquisition	0.00	0.00	0.00	0.00	2.78	2.78	0.00	0.18	0.18	0.00	1.15	1.15
Civil Works	0.00	3.51	3.51	0.00	12.21	12.21	0.00	8.78	8.78	0.00	8.69	8.69
Equipment	15.14	17.56	32.70	25.12	17.71	42.83	19.66	6.77	26.43	18.10	8.56	26.66
Installation and Commissioning	0.00	0.00	0.00	0.00	13.02	13.02	0.00	0.00	0.00	3.72	11.51	15.23
Training	0.00	0.06	0.06	0.18	0.09	0.27	0.13	0.03	0.16	0.21	0.04	0.25
Consulting Services	0.64	1.32	1.96	0.00	0.00	0.00	0.50	2.53	3.03	1.93	0.00	1.93
Pre-Production Cost	1.08	0.18	1.26	0.00	1.71	1.71	0.00	0.12	0.12	0.00	1.02	1.02
Interest and Commitment Charges	1.84	3.15	4.99	1.19	6.21	7.40	2.13	3.08	5.21	2.44	(0.37)	2.07
Other	0.00	0.07	0.07	0.00	4.20	4.20	0.00	0.98	0.98	0.00	2.73	2.73
Contingencies	3.24	5.69	8.93	0.00	0.00	0.00	3.07	5.04	8.11	0.00	0.00	0.00
Total	21.94	31.54	53.48	26.49	57.93	84.42	25.49	27.51	53.00	26.40	33.33	59.73

Component	Hechi Chemical Fertilizer Plant						Heilongjiang Chemical Plant					
	Appraised			Actual			Appraised			Actual		
	FX	LC	Total	FX	LC	Total	FX	LC	Total	FX	LC	Total
Land Acquisition	0.00	0.36	0.36	0.00	1.11	1.11	0.00	0.00	0.00	0.00	0.00	0.00
Civil Works	0.00	5.54	5.54	0.00	10.72	10.72	2.41	15.98	18.39	0.00	40.29	40.29
Equipment	18.67	10.18	28.85	25.83	11.58	37.41	17.78	17.24	35.02	34.51	37.13	71.64
Installation and Commissioning	0.00	0.00	0.00	0.00	9.87	9.87	0.00	0.00	0.00	0.00	39.66	39.66
Training	0.00	0.13	0.13	0.00	0.28	0.28	0.54	0.00	0.54	0.17	0.23	0.40
Consulting Services	0.14	1.88	2.02	0.00	0.00	0.00	0.40	4.21	4.61	0.00	0.00	0.00
Preproduction Cost	0.00	0.14	0.14	0.00	1.73	1.73	0.00	2.44	2.44	0.00	3.77	3.77
Interest and Commitment Charges	1.97	2.75	4.72	2.58	7.77	10.35	3.15	4.87	8.02	3.39	24.28	27.67
Other	0.00	1.26	1.26	0.00	3.66	3.66	4.25	1.82	6.07	0.00	8.00	8.00
Contingencies	2.84	5.07	7.91	0.00	0.00	0.00	4.65	9.68	14.33	0.00	0.00	0.00
Total	23.62	27.31	50.93	28.41	46.72	75.13	33.18	56.24	89.42	38.07	153.36	191.43

Component	Huainan General Chemical Plant						Pingdingshan Chemical Fertilizer Plant					
	Appraised			Actual			Appraised			Actual		
	FX	LC	Total	FX	LC	Total	FX	LC	Total	FX	LC	Total
Land Acquisition	0.00	0.26	0.26	0.00	0.32	0.32	0.00	0.00	0.00	0.00	1.17	1.17
Civil Works	0.50	11.16	11.66	0.00	37.00	37.00	0.00	4.24	4.24	0.00	7.56	7.56
Equipment	30.97	39.20	70.17	33.30	38.38	71.68	15.14	8.45	23.59	23.13	6.78	29.91
Installation and Commissioning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.67	0.00	16.10	16.10
Training	0.17	0.12	0.29	0.00	0.31	0.31	0.00	0.09	0.09	0.19	0.37	0.56
Consulting Services	0.00	2.24	2.24	0.00	0.00	0.00	0.65	1.83	2.48	0.00	0.00	0.00
Preproduction Cost	0.00	0.43	0.43	0.00	7.69	7.69	0.00	0.23	0.23	0.00	6.10	6.10
Interest and Commitment Charges	3.32	8.53	11.85	4.76	17.71	22.47	2.22	3.95	6.17	2.30	10.94	13.24
Other	4.78	3.59	8.37	9.98	2.78	12.76	1.08	0.21	1.29	0.00	6.97	6.97
Contingencies	0.00	14.84	14.84	0.00	0.00	0.00	3.02	4.65	7.67	0.00	0.00	0.00
Total	39.74	80.37	120.11	48.04	104.19	152.23	22.11	25.32	47.43	25.62	55.99	81.61

Component	Shaanxi Chemical Fertilizer Plant						Zhanyi Chemical Fertilizer Plant					
	Appraised			Actual			Appraised			Actual		
	FX	LC	Total	FX	LC	Total	FX	LC	Total	FX	LC	Total
Land Acquisition	0.00	1.19	1.19	0.00	4.15	4.15	0.00	0.00	0.00	0.00	0.00	0.00
Civil Works	2.28	9.76	12.04	0.00	17.52	17.52	0.00	4.33	4.33	0.83	8.35	9.18
Equipment	20.63	3.01	23.64	30.26	0.00	30.26	17.40	11.76	29.16	19.73	4.96	24.69
Installation and Commissioning	0.00	0.00	0.00	0.00	8.88	8.88	0.00	0.00	0.00	0.00	15.97	15.97
Training	0.20	0.07	0.27	0.12	0.09	0.21	0.00	0.12	0.12	0.00	0.03	0.03
Consulting Services	0.40	1.71	2.11	0.00	1.32	1.32	0.00	1.57	1.57	0.02	0.00	0.02
Preproduction Cost	0.00	0.14	0.14	0.00	2.93	2.93	0.00	0.14	0.14	0.00	0.76	0.76
Interest and Commitment Charges	2.46	1.85	4.31	3.44	3.39	6.83	1.82	2.28	4.10	2.18	6.44	8.62
Other	0.00	0.68	0.68	0.00	12.18	12.18	0.00	0.52	0.52	0.30	3.32	3.62
Contingencies	3.56	4.31	7.87	0.00	0.00	0.00	2.63	4.79	7.42	0.00	0.00	0.00
Total	29.53	22.72	52.25	33.82	50.46	84.28	21.85	25.51	47.36	23.06	39.83	62.89

FX = foreign exchange, LC = local currency.

Notes: Breakdown of cost estimates for the Exi Chemical Plant is not available. Unallocated FX cost of \$9.43 million brings total FX cost for ADB financing to \$250 million.

COMPARATIVE SUMMARY OF APPRAISED AND ACTUAL COSTS

Subproject	Appraised (\$ million)			Actual (\$ million)			Overrun (Shortage)					
	FX	LC	Total	FX	LC	Total	FX	%	LC	%	Total	%
							(\$ million)		(\$ million)			
Anyang Chemical Fertilizer Plant	21.94	31.54	53.48	26.49	57.93	84.42	4.55	20.7	26.39	83.7	30.94	157.9
Exi Chemical Fertilizer Plant	23.11	30.24	53.35	0.00	0.00	0.00	-23.11	-100.0	-30.24	-100.0	-53.35	0.0
Guizhou Chemical Fertilizer Plant	25.49	27.51	53.00	26.40	33.33	59.73	0.91	3.6	5.82	21.2	6.73	112.7
Hechi Chemical Fertilizer Plant	23.62	27.31	50.93	28.41	46.72	75.13	4.79	20.3	19.41	71.1	24.20	147.5
Heilongjiang Chemical Plant	33.18	56.24	89.42	38.07	153.36	191.43	4.89	14.7	97.12	172.7	102.01	214.1
Huainan General Chemical Plant	39.74	80.37	120.11	48.04	104.19	152.23	8.30	20.9	23.82	29.6	32.12	126.7
Pingdingshan Chemical Fertilizer Plant	22.11	25.32	47.43	25.62	55.99	81.61	3.51	15.9	30.67	121.1	34.18	172.1
Shaanxi Chemical Fertilizer Plant	29.53	22.72	52.25	33.82	50.46	84.28	4.29	14.5	27.74	122.1	32.03	161.3
Zhanyi Chemical Fertilizer Plant	21.85	25.51	47.36	23.06	39.83	62.89	1.21	5.5	14.32	56.1	15.53	132.8
Unallocated	9.43	0.00	9.43	0.00	0.00	0.00	-9.43	-100.0	0.00	0.00	-9.43	
Total	250.00	326.76	576.76	249.91	541.81	791.72	-0.09	-0.01	215.05	65.8	214.96	37.3

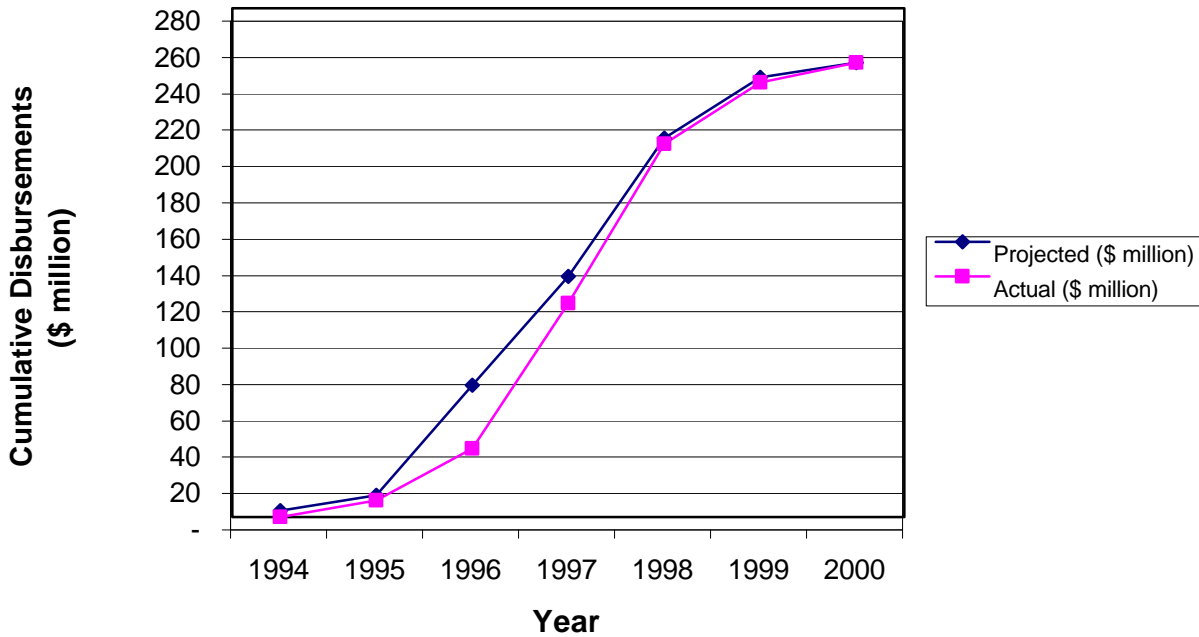
FX = foreign exchange, LC = local currency.

Note: Breakdown of cost estimates for the Exi Chemical Fertilizer Plant is not available.

PROJECTED AND ACTUAL DISBURSEMENTS, 1994–2000

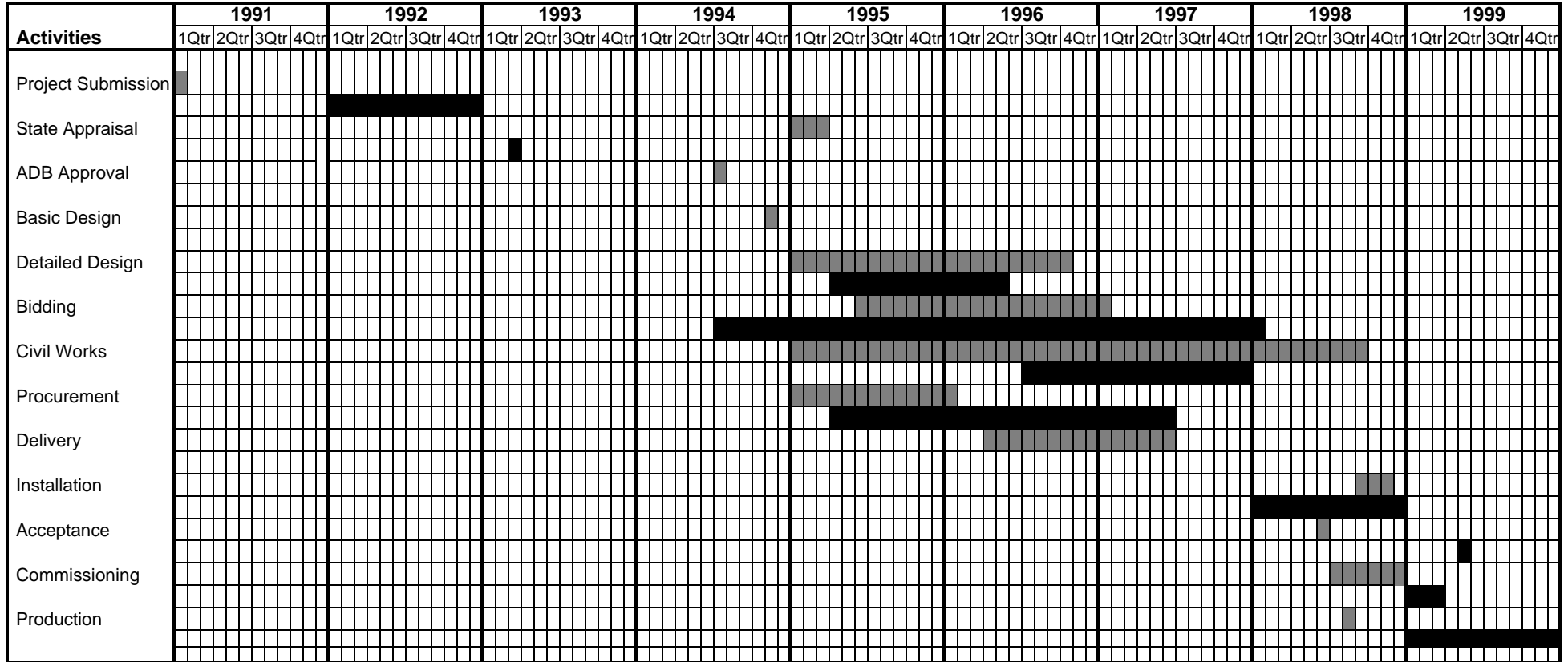
Year	For the Year (\$ million)		Cumulative		
	Projected	Actual	Projected (\$ million)	Actual (\$ million)	% of Loan
1994	3.50	0.17	3.50	0.17	0
1995	8.37	9.12	11.87	9.29	4
1996	60.66	28.37	72.53	37.66	15
1997	59.98	80.06	132.51	117.72	47
1998	76.00	87.70	208.51	205.42	82
1999	33.30	33.60	241.81	239.02	96
2000	8.20	10.89	250.00	249.91	100
Total	250.00	249.91			

Note: Annual projections exclude interest during construction, submitted annually by the eight enterprises.



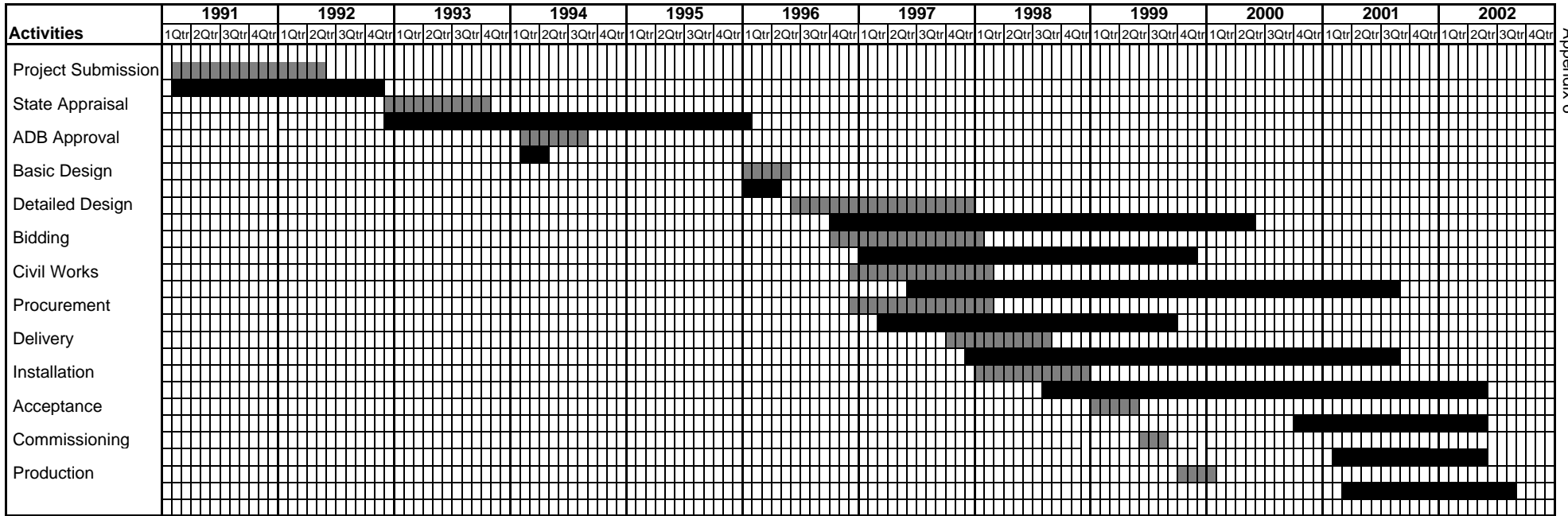
PROJECT IMPLEMENTATION SCHEDULE, 1991–2002

Figure A6.1: Anyang Chemical Fertilizer Plant



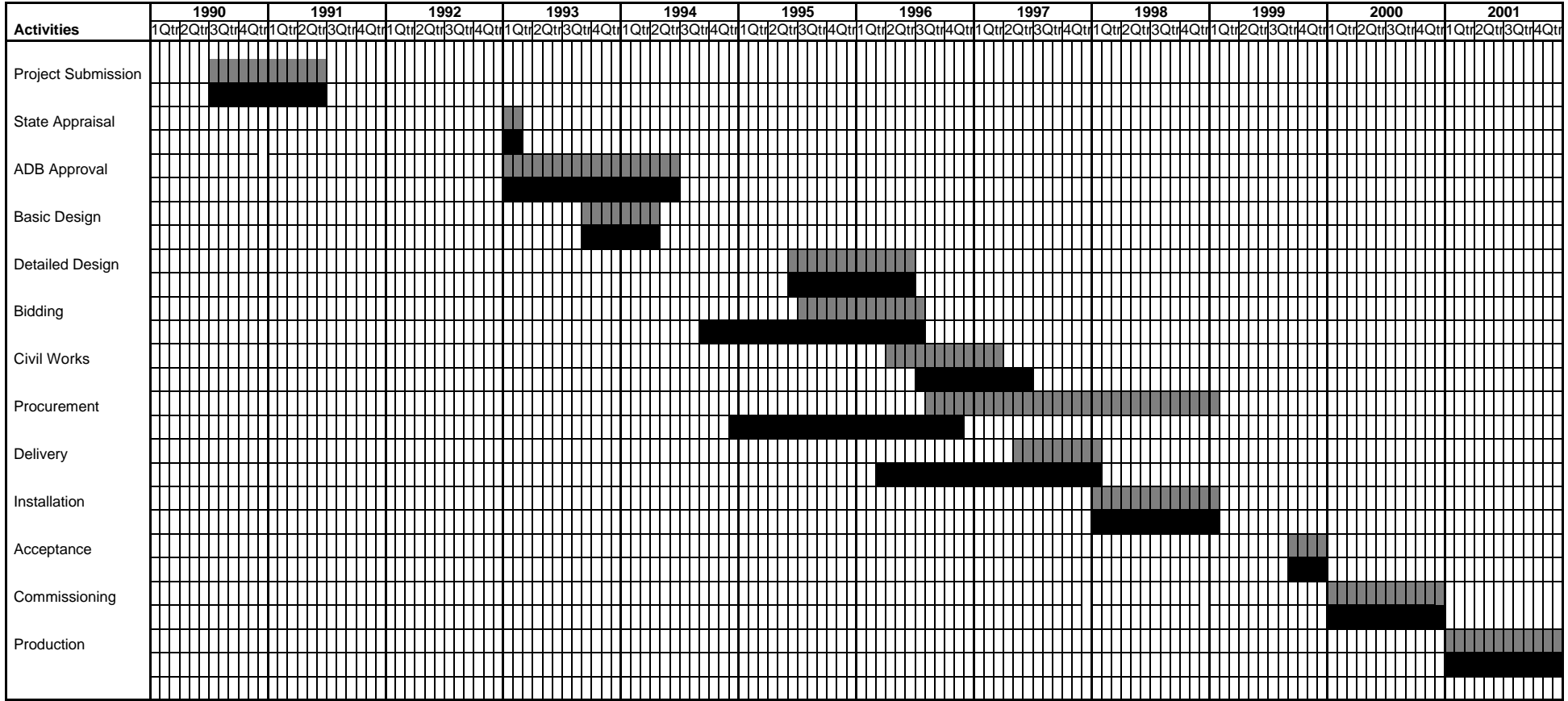
Legend: Projected Actual
 Qtr = quarter.

Figure A6.2: Guizhou Chemical Fertilizer Plant



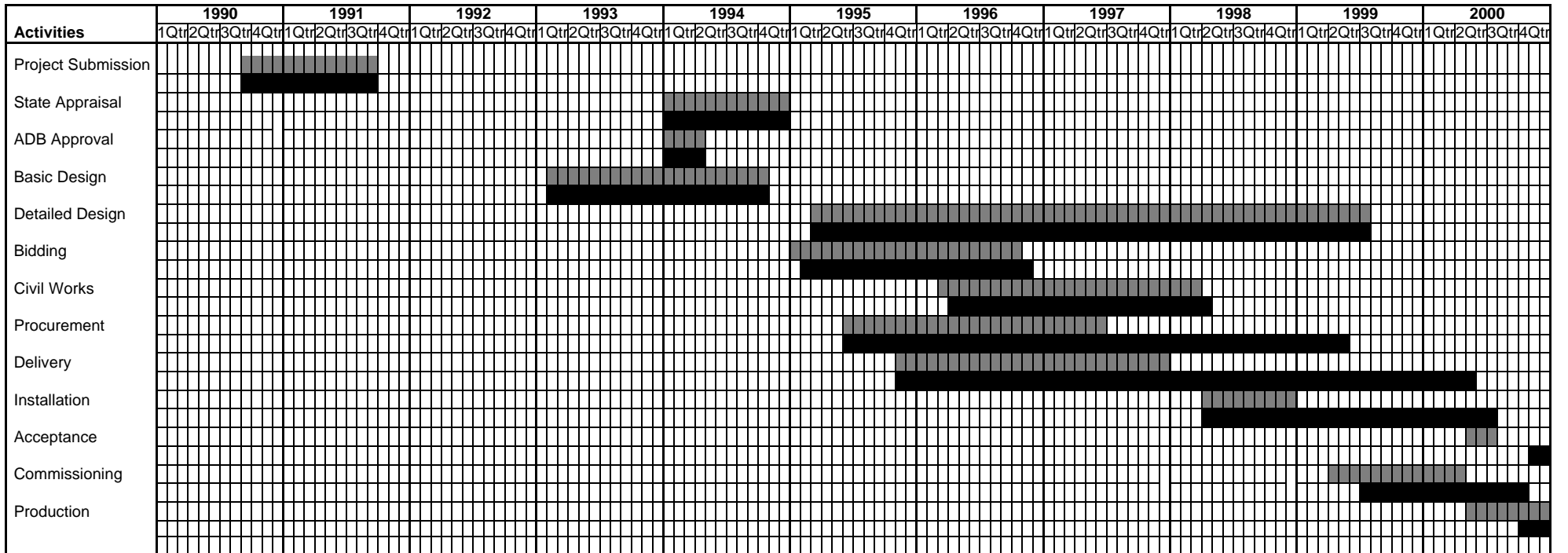
Legend:
 Projected
 Actual
 Qtr = quarter.

Figure A6.4: Heilongjiang Chemical Plant



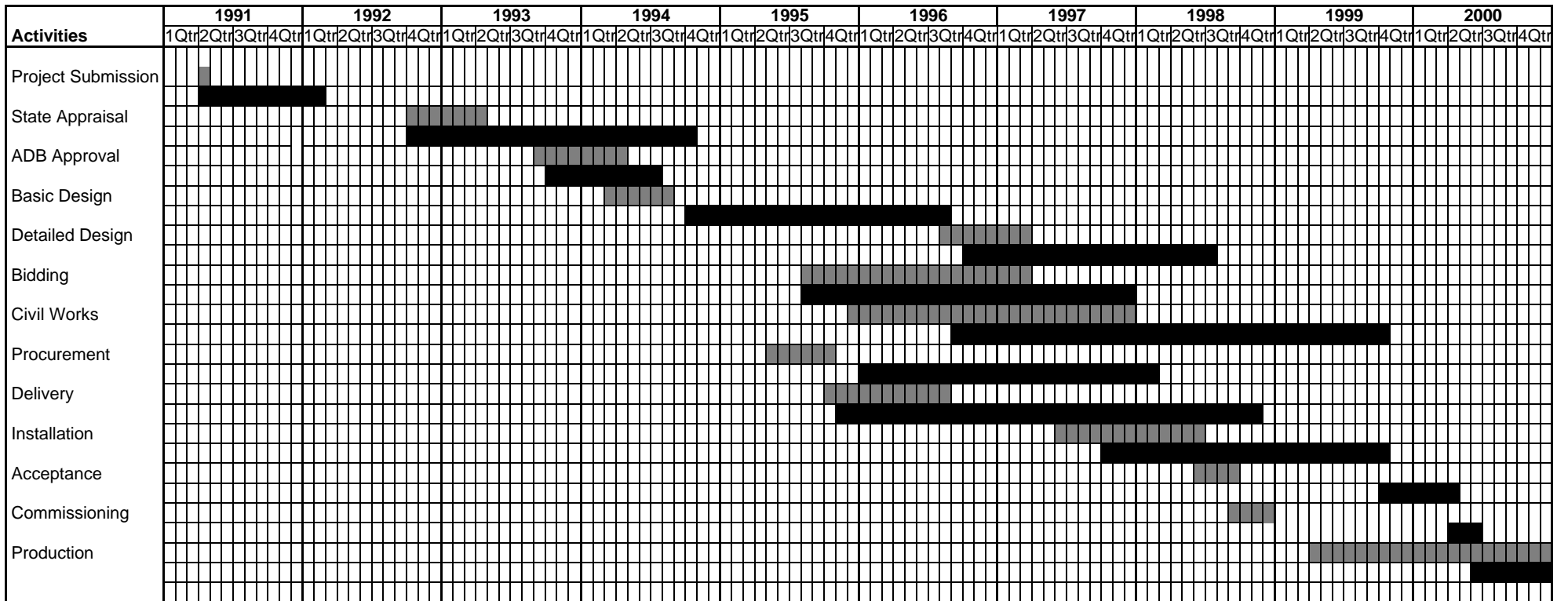
Legend: Projected Actual
 Qtr = quarter.

Figure A6.5: Huainan General Chemical Plant



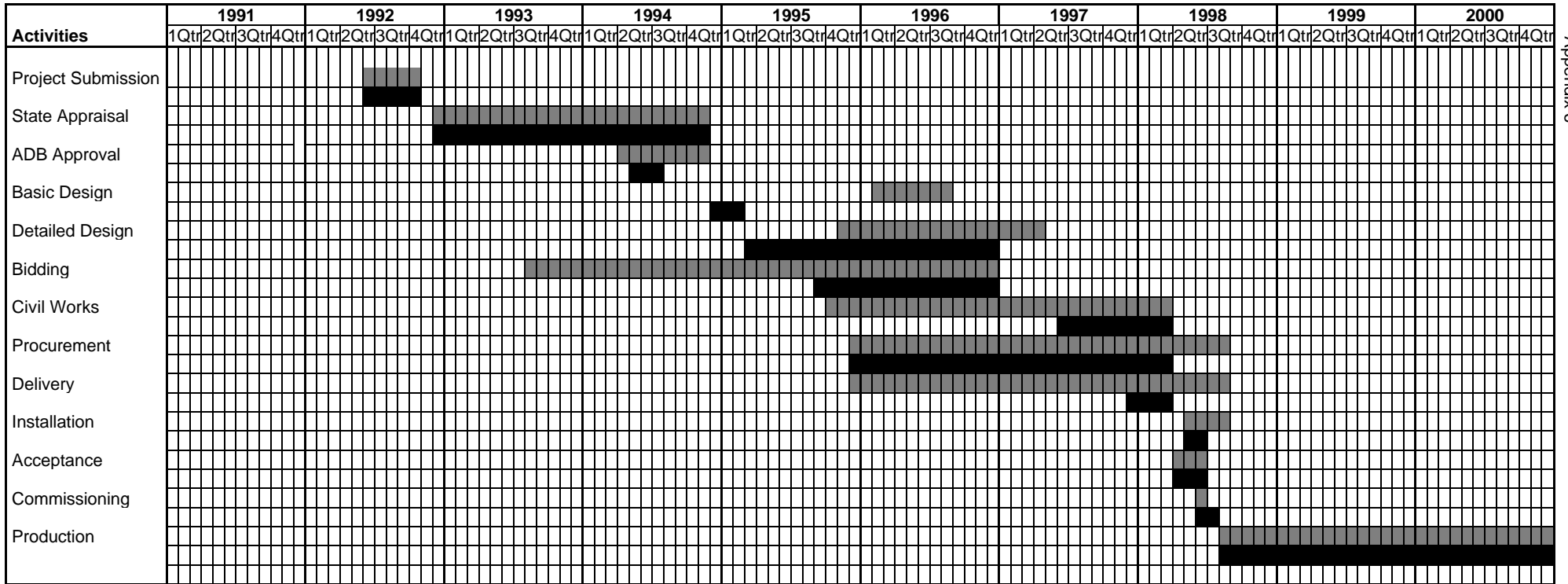
Legend: Projected Actual
 Qtr = quarter.

Figure A6.7: Shaanxi Chemical Fertilizer Plant



Legend: Projected Actual
 Qtr = quarter.

Figure A6.8: Zhanyi Chemical Fertilizer Plant



Legend: Projected Actual
 Qtr = quarter.

ORGANIZATION CHARTS

Figure A7.1: Organization Chart for Project Implementation

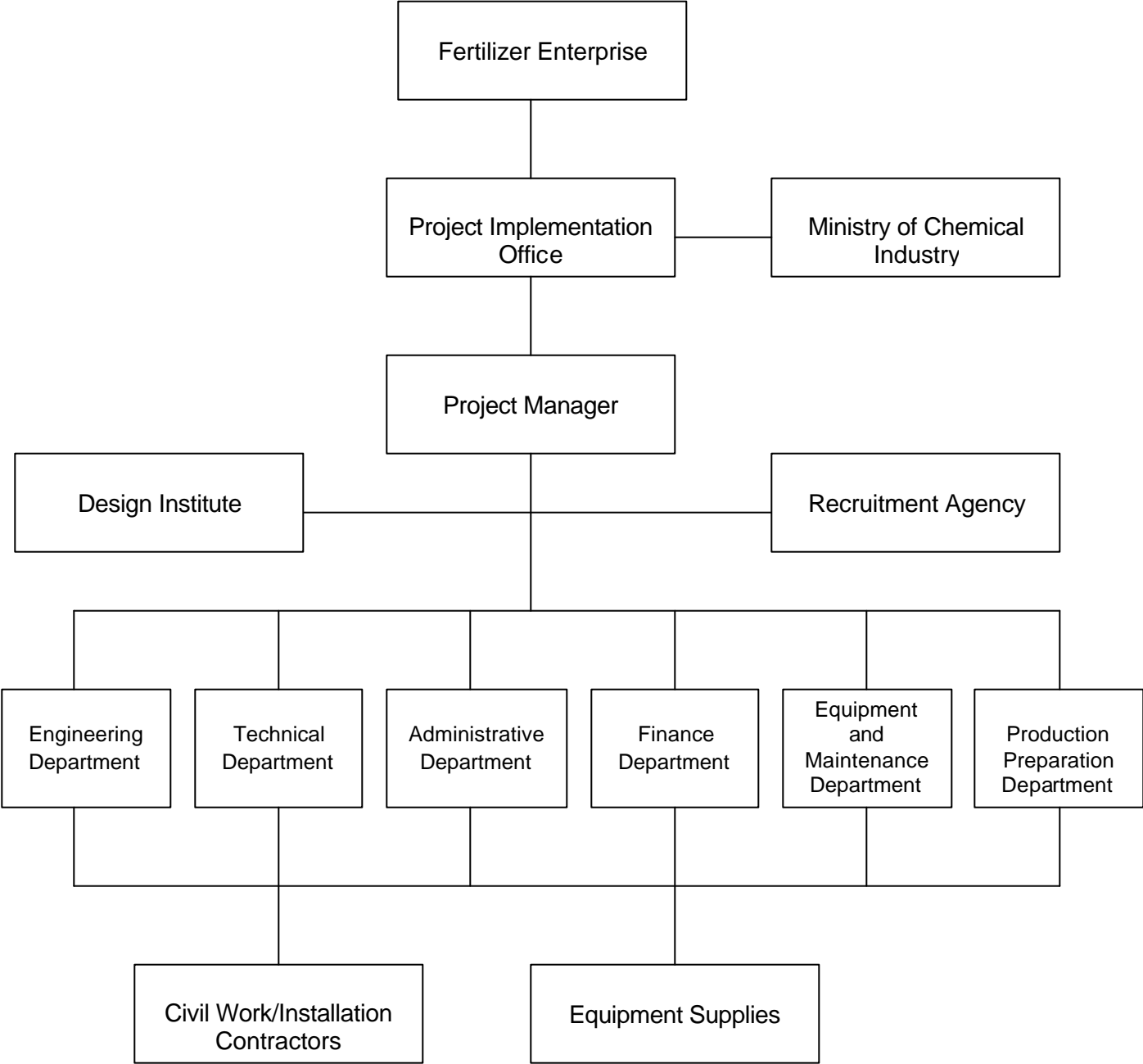


Table A7.2: Organization Chart of Anyang Chemical Industry Group Limited Company

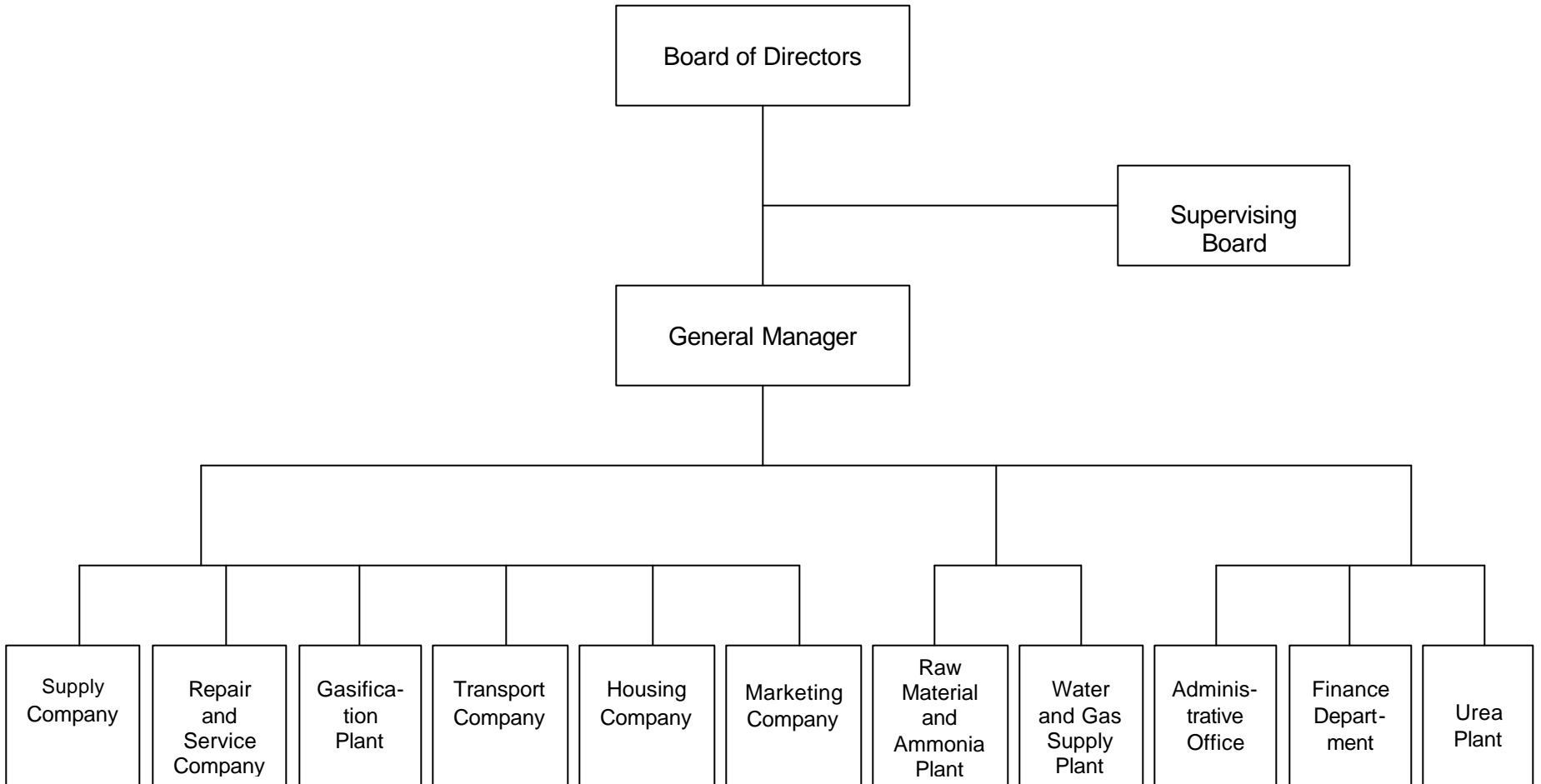


Table A7.3: Organization Chart of Guizhou Chemical Fertilizer Limited Responsibility Corporation

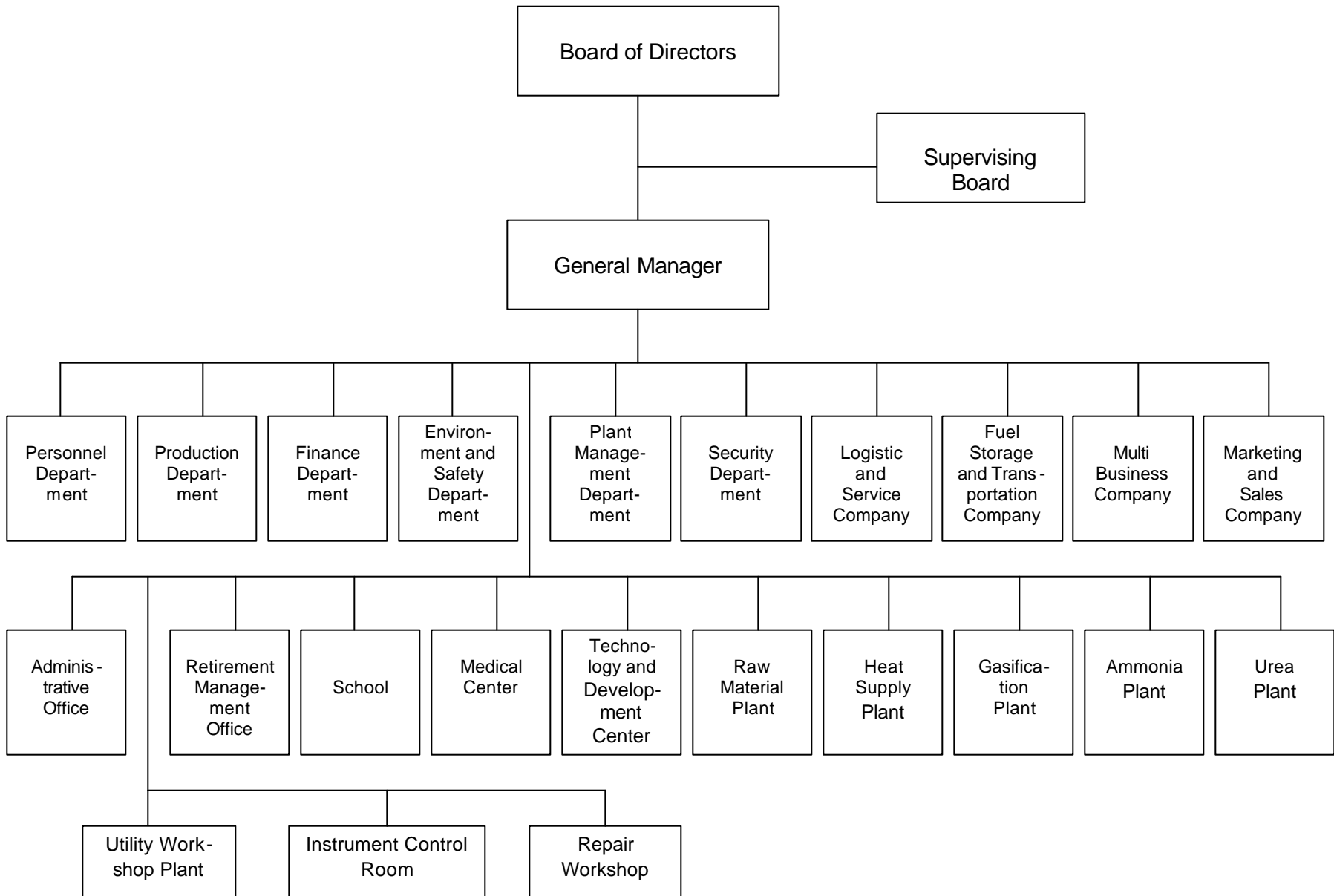


Table A7.4: Organization Chart of Hechi Chemical Fertilizer Share Holding Company

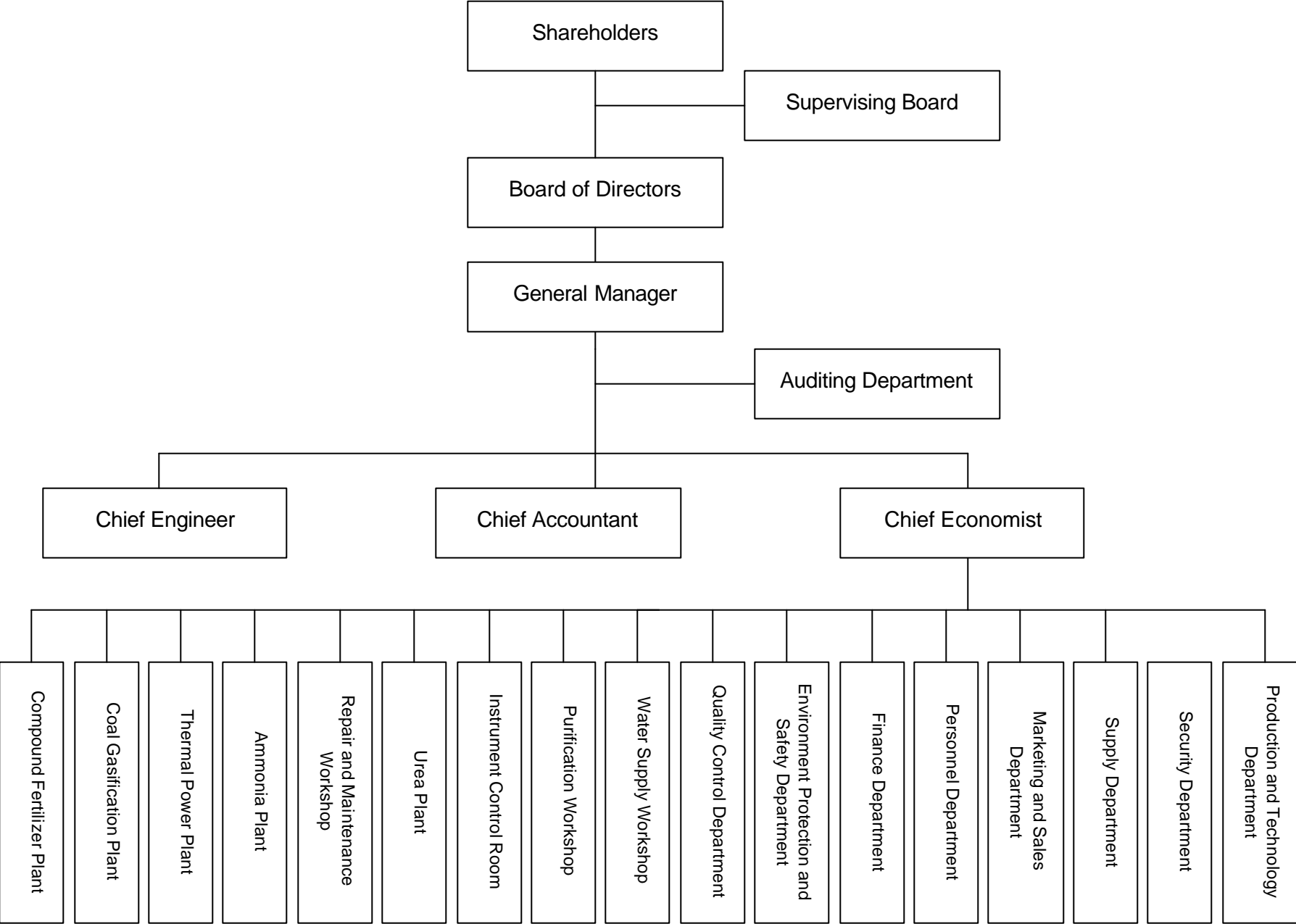


Table A7.5: Organization Chart of Heilongjiang Chemical Group Limited Company

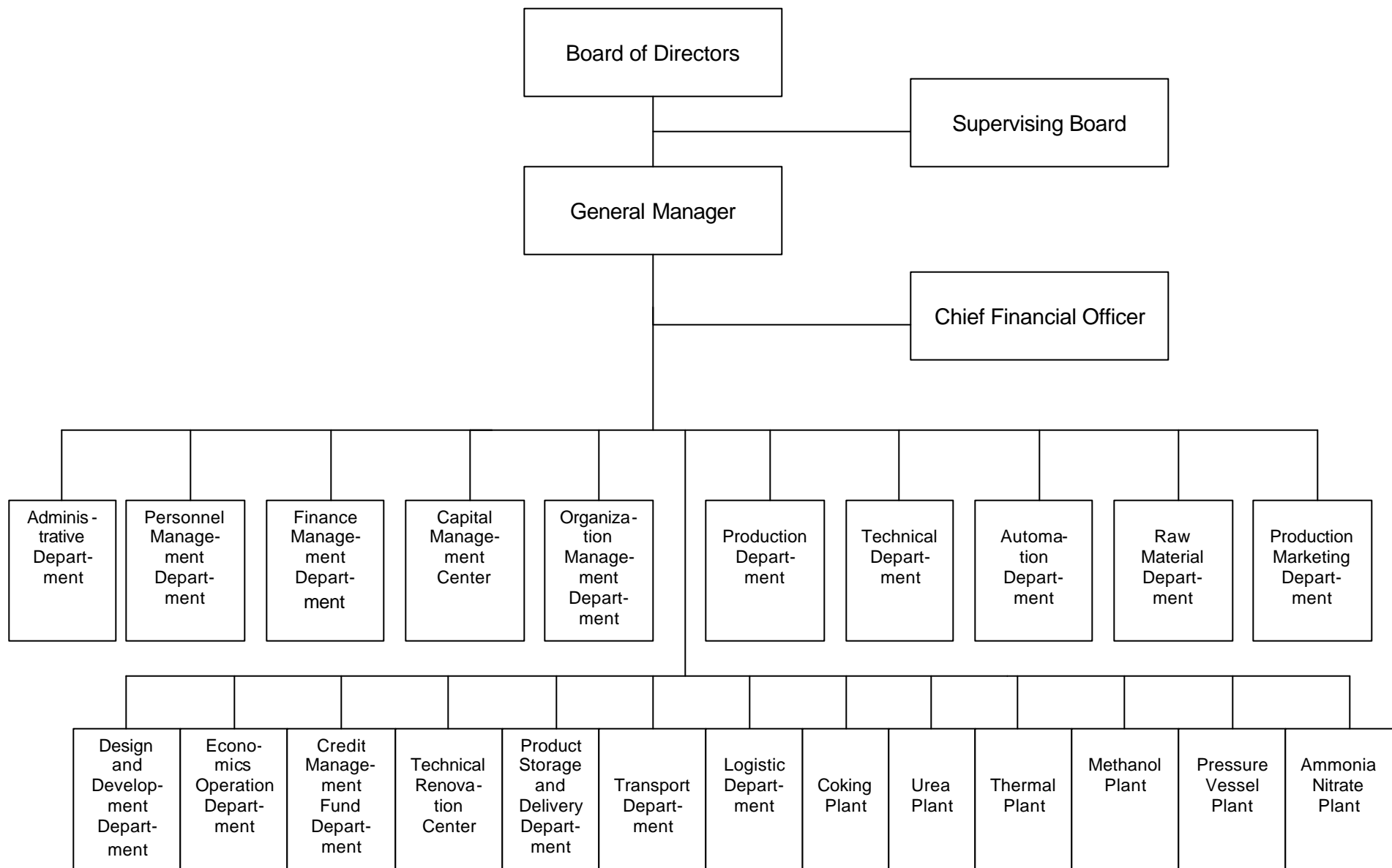


Table A7.6: Organization Chart of Huainan General Chemical Group Limited Company



Table A7.7: Organization Chart for Pingdingshan Chemical Group Limited

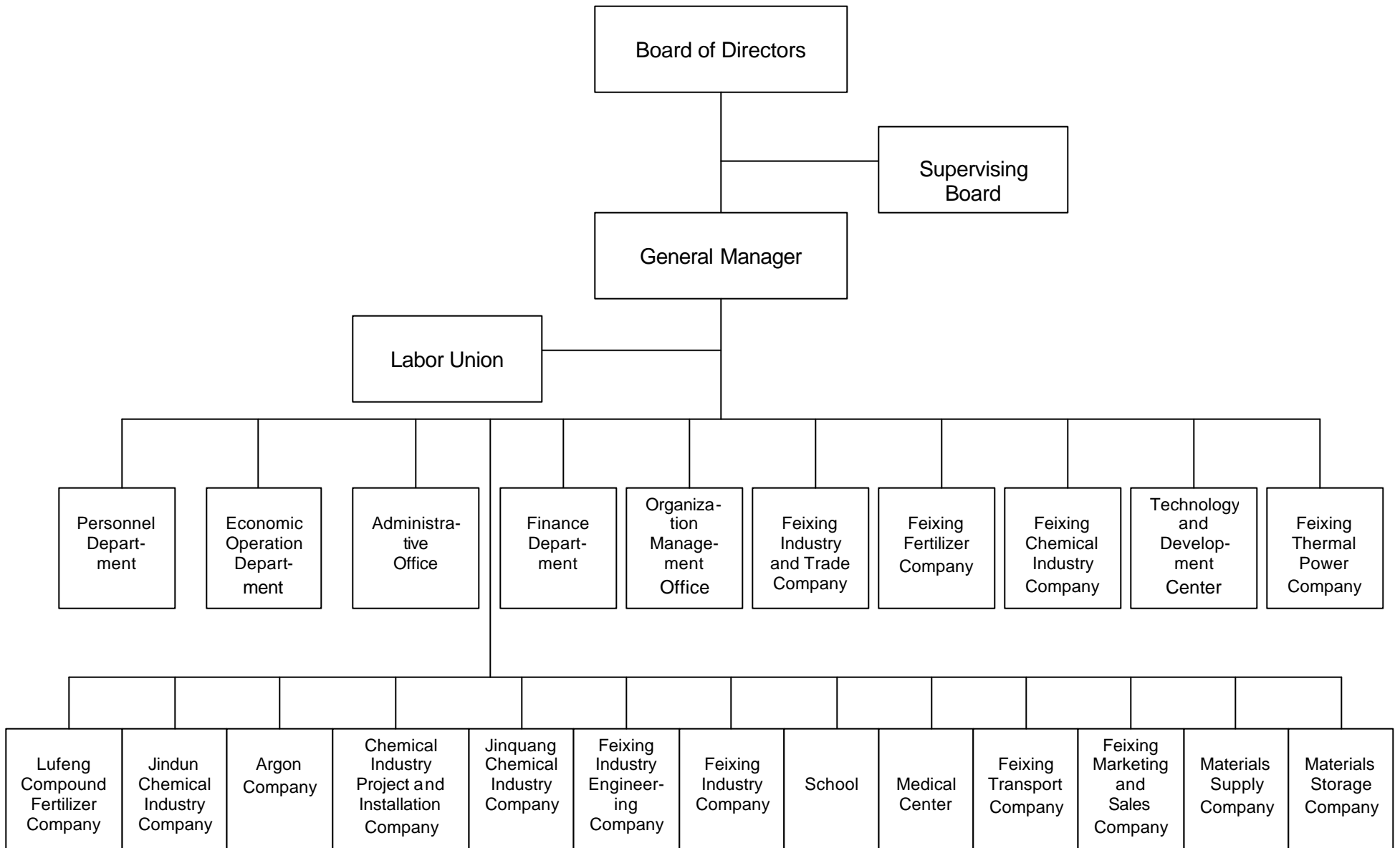


Table A7.8: Organization Chart of Shaanxi Shanhua Chemical Fertilizer Limited Company

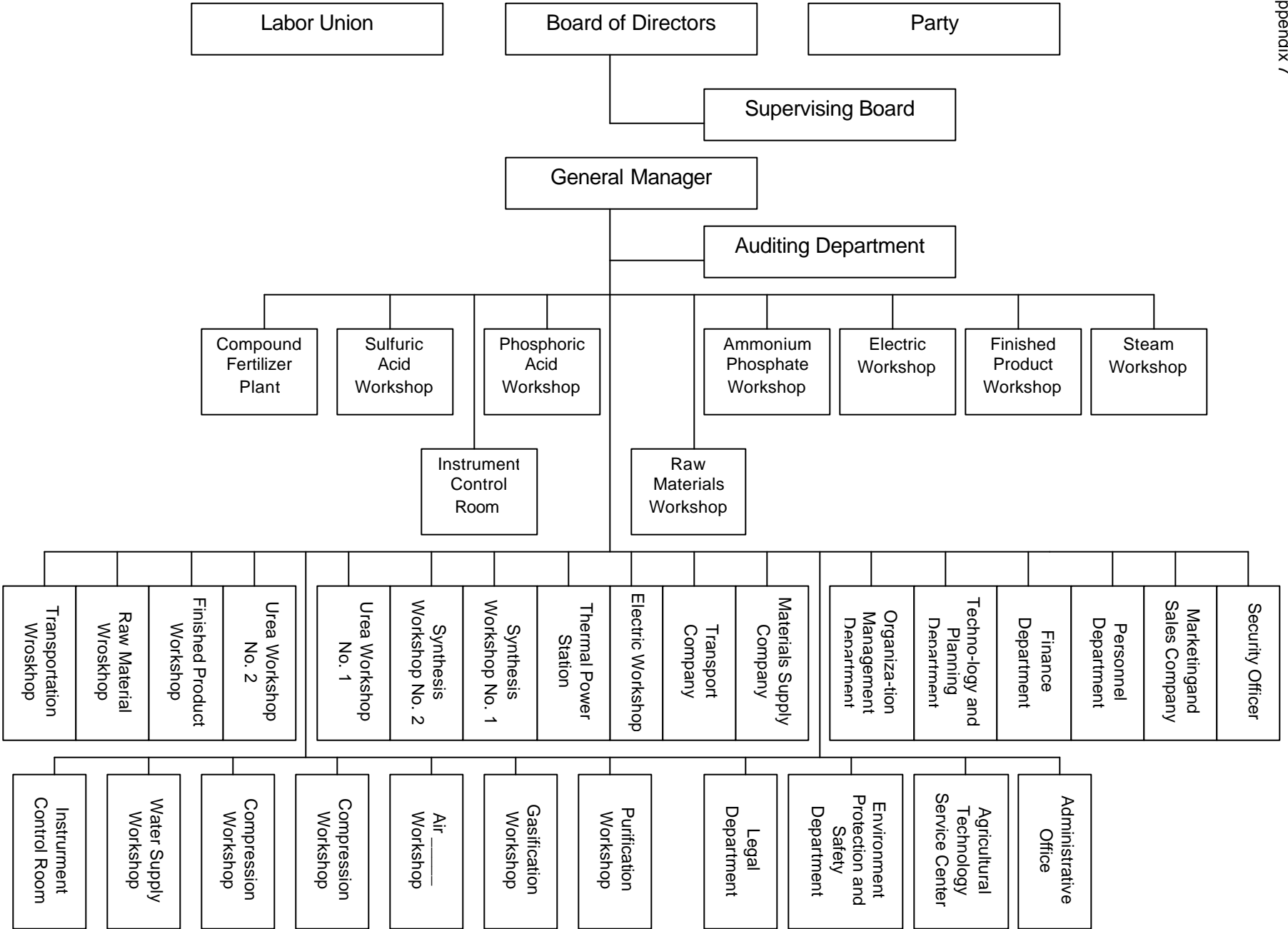
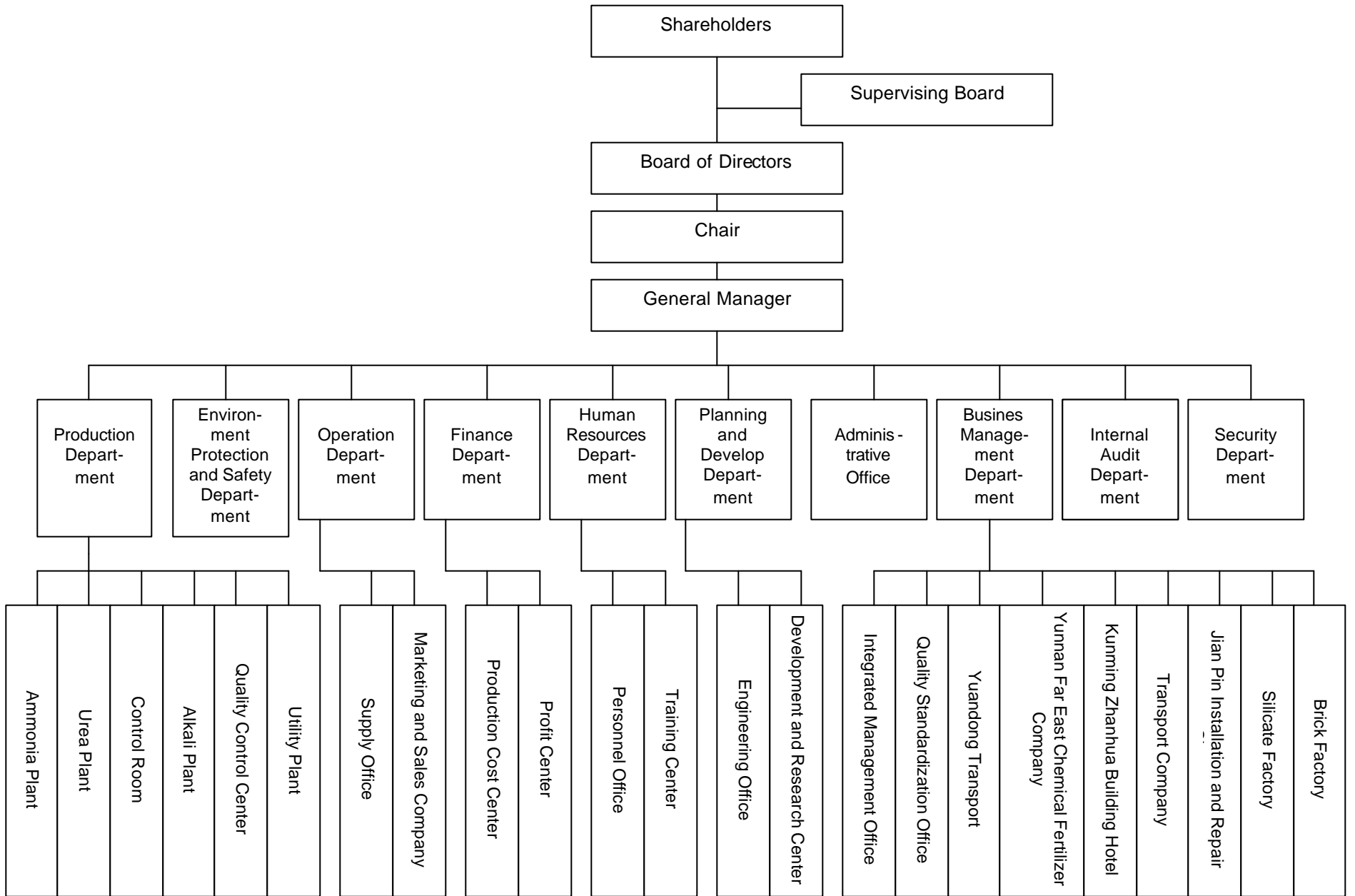


Table A7.9: Organization Chart of Zhanyi Chemical Fertilizer Limited Responsibility Company



COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference to Loan Documents	Status of Compliance
Implementation		
1. Implement the Project diligently and efficiently and in conformity with sound administrative, financial, engineering, environmental, and industrial practices.	Loan Agreement (LA) Section 4.01 (a)	Complied with.
2. Make available promptly as needed, the funds, facilities, services, land and other sources required, in addition to the proceeds of the Loan, for the carrying out of the Project.	LA Section 4.02	Partially complied with. GCFP was unable to secure sufficient counterpart funding in a timely manner.
3. Employ competent and qualified consultants and contractors on terms and conditions satisfactory to the Borrower and ADB.	LA Section 4.03 (a)	Complied with.
4. Carry out the Project in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to the Borrower and ADB.	LA Section 4.03 (b)	Complied with.
5. Ensure that activities of the departments and agencies with respect to carrying out the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative practices and procedures.	LA Section 4.04	Complied with.
6. Establish within MCI a Project Coordination Office to be headed by the Director of the Foreign Funds Utilization Office responsible for the overall coordination of the Project.	LA, Schedule 5, para. 1.	Complied with.
7. Establish a Project Implementation Office within each qualified enterprise to be headed by the Director or General Manager and staffed by an adequate number of qualified personnel which shall be responsible for the administrative, financial and technical supervision of the qualified Project.	LA, Schedule 5, para. 2	Complied with.

Covenant	Reference to Loan Documents	Status of Compliance
Reports and Records		
8. Maintain records and accounts adequate to identify the goods and services and other items of expenditure, to disclose its use in the Project, record the progress of each Qualified Project, and to reflect the operations and financial condition of each Qualified Enterprise in accordance with consistently maintained sound accounting principles.	LA Section 4.06 (a)	Complied with.
9. Submit audited accounts (within six months after the close of the fiscal year to which they relate) and related financial statements for each Qualified Project in English.	LA Section 4.06 (b)	Complied with except for 1996 and 1998, when one enterprise failed to submit the audited accounts. Partial compliance in 2000 and 2001.
10. Submit quarterly reports on the carrying out of the Project and on the operation and management of the Project facilities.	LA Section 4.07 (b)	Complied with.
11. Submit a report on the utilization of the Loan, the execution of the Qualified Projects (including costs), performance of the Borrower of its obligations under the Loan Agreement and the accomplishment of the purposes of the Loan not later than six months after closing of the loan account.	LA Section 4.07 (c)	Complied with late. The reports were only submitted in 2002.
12. Ensure that the Project facilities are operated, maintained and repaired in accordance with sound administrative, financial, engineering, environmental, industrial and maintenance and operational practices.	LA Section 4.09	Complied with.
Financial		
13. Ensure that each qualified Project maintains a debt-to-equity ratio of not greater than 70:30.	LA, Schedule 5, para. 7 (a) (i)	Complied with.
14. Ensure that each qualified Project maintains a debt-service ratio of at least 1.3 times.	LA, Schedule 5, para. 7 (a) (ii)	Not complied with. Financial performance of all the enterprises was weak because of higher production costs and lower prices for urea.

Covenant	Reference to Loan Documents	Status of Compliance
15. Ensure that each of the qualified Enterprises is allowed (i) to retain operating earnings sufficient to finance its current operations (including working capital, maintenance and repairs), and (ii) to accumulate adequate reserves to finance at least 30 percent of its future investment requirements.	LA, Schedule 5, para. 9	Partially complied with. Some enterprises were able to finance the diversification of feedstock and product mix.
Training		
16. Submit to ADB for approval a comprehensive training program for each qualified Enterprise.	LA, Schedule 5, para. 10	Complied with.
Environmental		
18. Establish in the qualified Project area monitoring stations and regularly report results of such monitoring to ADB.	LA, Schedule 5, para. 13	Complied with.
Benefit Monitoring and Evaluation		
19. Provide ADB with annual reports on Project benefit monitoring and evaluation (BME) during the first five years of full operation of each qualified Project. These reports shall assess the actual improvements achieved as compared with the targets and the extent of the benefits realized.	LA, Schedule 5 para. 14	Not complied with. The enterprises were unable to submit their BME reports in 2002.
Policy Reforms		
20. MCI to evaluate the benefits of the Project after it has been completed in accordance with a schedule and terms of reference mutually agreed upon with ADB.	LA, Schedule 5, para. 14 (b)	MCI was disbanded in 1998.
21. Implement the Sector Reform Action Plan agreed upon with ADB to ensure that: (i) By 31 December 1994, the qualified Enterprises set the price of all nitrogen fertilizer they produce according to the market forces; (ii) The farmgate price ceilings for nitrogen fertilizers set by the Borrower shall be increased to at least the cost of imported fertilizer by 31 December 1995 and shall be eliminated by December 1997; The prices of energy feedstock shall be brought to market levels by 31 December 1995 and shall be decontrolled by 31 December 1997.	LA, Schedule 5 paras. 15 to 18	Complied with. Products sold at market prices. Fertilizer price has been completely liberalized. Coal price was market-driven.

Covenant	Reference to Loan Documents	Status of Compliance
22. Market through any state or non-state marketing and distribution company or directly to the farmers all fertilizer produced by the qualified Enterprises starting 1 July 1994.	LA, Schedule 5, para. 19	Fertilizer has been freely sold to any buyer without market restrictions.
23. Commercialize the operations of the China National Agricultural Means of Production Group Corporation (CNAMPGC) to enable it to operate in a competitive environment; initiate steps to make CNAMPGC a shareholding entity; obtain for CNAMPGC and the Provincial Agricultural Means of Production Corporations, by 31 December 1995, foreign exchange requirements for fertilizer imports from the Foreign Exchange Adjustment Centers (FEACs) or their equivalent.	LA, Schedule 5, para. 20	Complied with. CNAMPGC is no longer involved with the distribution and marketing of fertilizer and is only involved with the financing of fertilizer plants.
24. Establish by 31 December 1994 a legal and regulatory framework for fertilizer marketing and distribution, covering standards, labeling, quality testing and enforcement of quality control taking into account the recommendations of the ADB-financed technical assistance for Fertilizer Sector Legal and Regulatory Development (TA 1884-PRC).	LA, Schedule 5, para. 21	Product quality was established for fertilizer.
25. Eliminate by 31 December 1994 all import subsidies; replace by 31 December 1995 the Borrower's import planning system with a tariff-based system.	LA, Schedule 5, para. 22	Complied with.
26. Increase by 31 December 1995 the number of trading companies allowed to import fertilizer.	LA, Schedule 5, para. 23	Complied with.
27. Prepare action plans satisfactory to ADB for qualified Enterprises to become shareholding entities; for qualified enterprises that meet the Borrower's conditions for becoming shareholding entities, implement such plans by 31 December 1997.	LA, Schedule 5, para. 24	Complied with. Two entities were restructured into shareholding companies with shares listed on the domestic stock market.
28. Prepare by 31 December 1994, a strategy acceptable to ADB for converting small-scale ammonium bicarbonate plants to urea and gradually closing down uneconomic plants, taking into account the findings of the ADB-financed technical assessment of Small-Scale Nitrogen Fertilizer Plants (TA 1885-PRC).	LA, Schedule 5, para. 25	Complied with. About 600 uneconomic plants have been shut down. Conversion of small-scale ammonium bicarbonate plants to urea is ongoing. However, concrete data to support these figures are not available.

SUMMARY OF ADB-FINANCED CONTRACTS

Table A9.1: Anyang Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0007	GER	50 Metric, ton fully hydraulic mobile crane and spare parts	499,950	IS	29 Mar 1995	8 May 1995
0013	ITA	400 MTPD (metric tons per day) urea plant	9,149,280	ICB	8 Jun1995	25 Jul 1995
0021	USA	Analytical instrument, metallographic detector and ultrasonic thickness gauge	119,000	IS	18 Dec 1995	5 Sep 1995
0022	PRC	Industrial x-ray radiographic equipment	24,000	IS	9 Nov 1995	6 Sep 1995
0023	PRC	Leeb's hardness tester	5,000	IS	9 Nov 1995	6 Sep 1995
0039	PRC	Double steam extraction turbo-generator unit	1,050,000	ICB	3 May 1996	9 May 1996
0040	PRC	75 TPD (ton per day) circulating fluidized bed boiler	1,580,000	ICB	3 May 1996	9 May 1996
0049	PRC	Hydrogren compressor unit	2,980,000	ICB	27 May 1996	28 May 1996
0059	PRC	Overseas travel expenses	24,590	DP	17 Jul 1996	1 Jul 1996
0065	HKG	Semi-poor solution pump	485,000	IS	10 Sep 1996	5 Sep 1996
0066	HKG	Poor solution pump	419,000	IS	10 Sep 1996	5 Sep 1996
0074	PRC	Travel expenses	52,828	DP	26 Sep 1996	10 Sep 1996
0085	SWI	Amonia converter parts	499,000	IS	26 Nov 1996	4 Nov 1996
0090	HKG	3200 NH3 shift transformer and auxiliaries	450,000	IS	9 Dec 1996	26 Nov 1996
0091	HKG	TC450/32-1311 turbine circulator unit and auxiliaries	490,000	IS	9 Dec 1996	27 Nov 1996
0102	HKG	Distributed control system of computer unit	589,946	ICB	23 Dec 1996	31 Dec 1996
0103	HKG	Special instruments	134,880	IS	20 Dec 1996	12 Dec 1996
0122	HKG	Special tools (hexagonal torque wrenches)	39,000	DP	19 May 1997	29 Apr 1997
0123	PRC	Water and fire resistant materials	482,349	IS	6 Jun 1997	29 Apr 1997
0124	PRC	Special steel materials	368,300	IS	6 Jun 1997	29 Apr 1997
0125	PRC	Pressure transmitters	427,200	IS	6 Jun 1997	4 May 1997
0126	PRC	Special valve	164,726	IS	6 Jun 1997	30 May 1997
0127	PRC	Electric switch cabinet	424,400	IS	6 Jun 1997	8 May 1997
0128	PRC	Elbows, flange and pipes	444,340	IS	6 Jun 1997	8 May 1997
0129	PRC	Valves	470,098	IS	6 Jun 1997	9 May 1997
0130	PRC	Special valves and mass flow meter	223,700	IS	6 Jun 1997	12 May 1997
0131	PRC	Special process analyzer system	131,200	IS	16 Jun 1997	8 May 1997
0136	PRC	Chromatograph and auxiliaries	110,200	IS	16 Jun 1997	9 May 1997
0137	HKG	Distributed control system of computer unit	400,000	IS	16 Jun 1997	15 May 1997
0140	PRC	Travel expenses	45,261	DP	23 Jul 1997	16 Jun 1997
0150	PRC	UPS (uninterrupted power sevice) for distributed control system of computer units	97,528	IS	12 Aug 1997	1 Aug 1997

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0170	PRC	Travel expenses for equipment inspection group	21,570	DP	19 Dec 1997	24 Oct 1997
0173	PRC	Heat-resistant stainless tube	432,000	IS	15 Jan 1998	30 Dec 1997
0174	PRC	Stainless tube package	364,500	IS	15 Jan 1998	30 Dec 1997
0175	PRC	High-voltage cable	487,665	IS	15 Jan 1998	30 Dec 1997
0178	PRC	Fellowship	10,412	DP	26 Feb 1998	12 Jan 1998
0192	PRC	Liquidation of imprest account	13,153	DP	31 Aug 1998	10 Jul 1998
0217	PRC	Valves and transmitters	380,000	IS	8 Jun 2000	12 May 2000
Number of Contracts Amount			40 \$ 24,090,076			

Table A9.2: Guizhou Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0074	PRC	Travel expenses	34,018	DP	26 Sep 1996	10 Sep 1996
0101	ITA	400 MTPD (metric ton per day) urea plant	8,740,000	ICB	13 Dec 1996	19 Dec 1996
0141	CAN	Coal gas blowers for ammonia unit	281,687	IS	30 Jun 1997	18 Jul 1997
0142	PRC	Nitrogen-hydrogren compressor	1,917,615	ICB	9 May 1997	16 Jul 1997
0143	PRC	Liquid ammonia spherical tanks	306,726	IS	26 Jun 1997	16 Jul 1997
0144	HKG	Refrigeration equipment for ammonia unit	308,673	IS	26 Jun 1997	23 Jul 1997
0145	PRC	Transformer	162,655	IS	9 May 1997	24 Jul 1997
0146	PRC	Thyristor for ammonia unit	16,304	IS	26 Jun 1997	17 Jul 1997
0153	PRC	Gasification furnaces and related static Equipment	938,965	ICB	18 Jul 1997	26 Jul 1997
0172	HKG	Distributed control system and field instruments	635,000	ICB	11 Dec 1997	23 Dec 1997
0176	PRC	Carbon dioxide compressors	694,504	ICB	4 Dec 1997	30 Dec 1997
0177	PRC	Static equipment of shift conversion and shift gas desulphurization	693,124	ICB	4 Dec 1997	30 Dec 1997
0179	USA	CO2 (carbon dioxide) removal solution regeneration technology and energy recovery pumps	1,225,940	ICB	5 Dec 1997	16 Jan 1996
0181	PRC	50 ton truck crane	291,532	IS	12 Mar 1998	27 Feb 1998
0182	PRC	Urea static equipment	218,000	IS	12 Mar 1998	28 Feb 1998
0183	PRC	Copper wash static equipment	418,000	IS	12 Mar 1998	28 Feb 1998
0199	PRC	Static synthesis equipment	638,200	ICB	2 Oct 1998	2 Oct 1998
0203	PRC	Rotary equipment	1,380,000	ICB	3 Feb 1999	12 Mar 1999
0204	PRC	Desulfurization static equipment	678,300	ICB	3 Feb 1999	12 Mar 1999
0211	HKG	Field instruments	1,257,984	ICB	7 Sep 1999	10 Sep 1999
0212	PRC	Static equipment	749,651	ICB	7 Sep 1999	10 Sep 1999
0213	PRC	Piping materials	2,407,630	ICB	7 Sep 1999	10 Sep 1999
0219	PRC	Equipment and spare parts	15,492	DP	22 Aug 2000	21 Jul 2000

Number of Contracts
Amount

22
\$ 24,010,000

Table A9.3: Hechi Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0011	JPN	Truck crane	352,550	IS	24 Aug 1995	30 Jun 1995
0024	ITA	400 MTPD (metric tons per day) urea plant	8,130,000	ICB	19 Sep 1995	7 Dec 1995
0035	PRC	Hydrogen-nitrogen gas compressor	1,957,500	ICB	26 Feb 1996	12 Mar 1996
0051	PRC	Digital programme control exchanger	285,300	IS	5 Jun 1996	14 May 1996
0053	PRC	Turbine recycle compressors	719,800	IS	5 Jun 1996	14 May 1996
0067	PRC	Carbon dioxide gas compressor	897,800	ICB	6 Jun 1996	28 Aug 1996
0068	USA	Decarbonization pumps	599,000	ICB	6 Jun 1996	26 Aug 1996
0069	HKG	Static rquipment for hasification unit	1,410,000	ICB	6 Jun 1996	26 Aug 1996
0070	PRC	Static rquipment for dynthetic unit	831,132	ICB	6 Jun 1996	24 Aug 1996
0071	PRC	Static rquipment for purification unit	1,816,210	ICB	6 Jun 1996	24 Aug 1996
0072	PRC	Bridge vranes	411,200	IS	27 Sep 1996	26 Aug 1996
0073	PRC	Pressure dwing sbsorption unit	238,500	IS	27 Sep 1996	26 Aug 1996
0079	PRC	Low-pressure dtatic rquipment	198,000	IS	12 Nov 1996	26 Oct 1996
0080	PRC	Palletizer, packing and transportation equipment	258,537	IS	12 Nov 1996	26 Oct 1996
0081	PRC	Valves and fittings	576,000	IS	12 Nov 1996	26 Oct 1996
0113	PRC	Various goods and group training	14,793	DP	19 Mar 1997	28 Feb 1997
0115	PRC	Steel	418,000	IS	9 Apr 1997	28 Mar 1997
0116	HKG	Distributed control system	562,854	ICB	4 Feb 1997	27 Mar 1997
0134	PRC	Piping materials	1,693,136	ICB	30 Apr 1997	16 May 1997
0135	PRC	Ammonia plant and utilities instruments	1,231,000	ICB	8 Apr 1997	22 May 1997
0147	PRC	Power transformer and substation automatic control system	1,168,133	ICB	26 Jun 1997	28 Jul 1997
0148	PRC	Blowers, centrifugal pumps and screw refrigeration compressors	668,447	ICB	10 Jul 1997	23 Jul 1997
0149	PRC	Desulphurization section and static equipment	619,953	ICB	26 Jun 1997	23 Jul 1997
0178	PRC	Fellowship	12,173	DP	26 Feb 1998	12 Jan 1998
0186	USA	Instruments and materials	212,000	IS	15 Apr 1998	20 Mar 1998
0206	PRC	Instruments and electrical materials	280,550	IS	26 Apr 1999	18 Mar 1999
0215	PRC	Semiwater station equipment	249,885	IS	4 Oct 1999	24 Sep 1999
0219	PRC	Equipment and spare parts	17,547	IS	4 Oct 1999	21 Jul 2000
Number of Contracts			25			
Amount			\$ 25,830,000			

Table A9.4: Heilongjiang Chemical Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0002	PRC	870 MTPD (metric ton per day) urea plant	12,902,800	ICB	6 Dec 1994	28 Mar 1995
0003	DEN	Methanolation-methanation process software package and equipment	2,233,000	ICB	6 Dec 1994	29 Mar 1995
0004	SWI	Ammonia synthesis loop	3,250,000	ICB	6 Dec 1994	30 Mar 1995
0005	JPN	Synthetic gas compressor	4,052,000	ICB	28 Mar 1995	17 Apr 1995
0006	GER	Air compressor	2,481,400	ICB	28 Mar 1995	21 Apr 1995
0016	USA	P&H CNT 650 hydraulic truck crane	495,000	IS	12 Oct 1995	1 Jun 1995
0017	HKG	Plate heat exchange	68,158	IS	10 Oct 1995	2 Aug 1995
0018	JPN	Feed gas compressor	2,730,000	ICB	28 Mar 1995	1 Jul 1995
0037	PRC	Overseas travel expenses	75,106	DP	3 Apr 1996	1 Feb 1996
0045	USA	Decarbonization solution pump and motor	494,040	IS	23 May 1996	4 Jul 1995
0046	USA	Sulphur removal solution pump	332,480	IS	23 May 1996	4 Jul 1995
0047	USA	Hydraulic power recovery turbines	211,480	IS	23 May 1996	4 Jul 1995
0048	DEN	Sulphur guard catalyst	119,000	IS	27 May 1996	25 Apr 1996
0052	PRC	Low temperature solution plate heat exchanger	98,000	IS	17 Dec 1996	1 Dec 1995
0060	PRC	Heat exchangers	402,120	IS	6 Sep 1996	14 Aug 1996
0061	PRC	Vessels and drums	449,600	IS	6 Sep 1996	14 Aug 1996
0062	PRC	Electrical accessories	480,840	IS	6 Sep 1996	15 Aug 1996
0063	PRC	Laboratory instruments and associated installation and maintenance tools	333,600	IS	6 Sep 1996	16 Aug 1996
0064	PRC	Pipes, fittings and valves	429,729	IS	6 Sep 1996	16 Aug 1996
0077	PRC	Insulation materials, paints and lubricants	194,840	IS	11 Apr 1996	15 Aug 1996
0084	HKG	Distributed control system for boiler plant	490,000	IS	26 Nov 1996	26 Oct 1996
0086	HKG	Distributed control system for ammonia plant	470,000	IS	26 Nov 1996	27 Oct 1996
0087	HKG	Distributed control system for coal gas plant	450,000	IS	26 Nov 1996	26 Oct 1996
0104	PRC	Goods and training	37,999	DP	6 Jan 1997	5 Nov 1996
0105	PRC	Goods and training	38,187	DP	6 Jan 1997	10 Nov 1996
0106	HKG	Refrigerator set (water chiller)	139,989	IS	28 Jan 1997	15 Oct 1996
0107	JPN	Steam turbine for NH3 ammonia compressor	480,000	IS	28 Jan 1997	15 Nov 1996
0113	PRC	Goods and training	18,140	DP	19 Mar 1997	28 Feb 1997
0140	PRC	Computer	6,000	DP	23 Jul 1997	16 Jan 1997
0151	PRC	UPS (uninterrupted power service) for boiler plant	136,000	IS	17 Feb 1997	16 Dec 1996
0152	PRC	Main condenser and auxiliary equipment of steam turbine	412,000	IS	28 Jan 1997	15 Nov 1996
0200	GER	Rotamat sludge dewatering press	71,478	DP	16 Jul 1998	22 Sep 1998
0201	USA	Sulphur analyzer	33,839	DP	14 Aug 1998	1 Sep 1998

Number of Contracts
Amount

32
\$ 34,616,825

Table A9.5: Huainan General Chemical Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0008	JPN	Truck crane	351,607	IS	21 Aug 1995	30 Jun 1995
0036	ITA	900 MTPD (metric tons per day) urea plant	10,830,000	ICB	4 Jan 1996	8 Feb 1996
0043	DEN	100 MTPD (metric tons per day) ammonia synthesis loop equipment	1,866,341	ICB	10 Jan 1996	17 Apr 1996
0044	JPN	Synthesis gas of coal slurry gasification plant	19,280,000	ICB	4 Jan 1996	16 May 1996
0113	PRC	Various goods and group training	30,142	DP	19 Mar 1997	28 Feb 1997
0121	USA	Decarbonization and desulphurization pumps	1,950,000	ICB	04 Apr 1997	28 Apr 1997
0161	PRC	Low and medium pressure heat exchangers for urea	615,000	ICB	24 Oct 1997	5 Nov 1997
0162	USA	Gasifier package for coal gasification	1,197,500	ICB	24 Oct 1997	31 Oct 1997
0163	PRC	Medium and low pressure vessels for urea	289,888	IS	14 Nov 1997	8 Oct 1997
0164	PRC	Medium and low pressure towers for urea	181,000	IS	14 Nov 1997	9 Oct 1997
0188	GER	Process design package for recovery and proprietary equipment	1,220,218	ICB	7 Jan 1998	15 Jul 1998
0193	SIN	Pipe fittings and valves	410,000	ICB	19 Aug 1998	10 Sep 1998
0194	JPN	Centrifugal pumps	514,800	ICB	17 Aug 1998	13 Sep 1998
0195	JPN	Control valves	647,230	ICB	17 Aug 1998	17 Sep 1998
0196	USA	Process valves	983,500	ICB	19 Aug 1998	25 Sep 1998
0197	FIN	Control valves	567,000	ICB	10 Aug 1998	25 Sep 1998
0202	GER	Analytical instruments	465,000	ICB	12 Jan 1999	20 Jan 1999
0205	PRC	Study tour	19,651	DP	5 Apr 1999	8 Feb 1999
0207	PRC	Boilers	1,196,000	ICB	22 May 1999	2 Jun 1999
0209	PRC	Boiler auxiliary equipment	264,000	IS	17 Aug 1999	6 Aug 1999
0210	PRC	Pressure equipment for desulphurization	113,000	IS	17 Aug 1999	6 Aug 1999
0216	JPN	Instrument and control systems	189,500	IS	24 Nov 1999	8 Nov 1999
0218	PRC	Full rectifying argon extraction plant	498,336	IS	30 Jun 2000	21 Jun 2000

Number of Contracts
Amount

22
\$ 43,679,713

Table A9.6: Pingdingshan Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0012	KOR	400 Metric-ton-per-day urea plant	9,975,000	ICB	21 Jul 1995	18 Aug 1995
0025	KOR	Other equipment for urea plant	405,000	IS	5 Sep 1995	18 Aug 1995
0050	PRC	Electrical generator	1,436,557	ICB	23 May 1996	27 May 1996
0054	PRC	130 TPH (tons per hour) coal-fired steam boiler plant	1,660,000	ICB	21 May 1996	20 Jun 1996
0055	PRC	Air separation plant	2,461,999	ICB	21 May 1996	14 Jun 1996
0059	PRC	Overseas travel expenses	121,625	DP	17 Jul 1996	1 Jul 1996
0075	USA	Decarbonization solution pumps	488,000	IS	4 Oct 1996	12 Jul 1996
0076	USA	Hydraulic power recovery turbines	405,300	IS	4 Oct 1996	12 Jul 1996
0082	PRC	Refrigeration plants	332,200	IS	26 Nov 1996	17 Oct 1996
0083	PRC	Program exchanger	306,000	IS	26 Nov 1996	16 Oct 1996
0088	HKG	Distributed control system for ammonia plant	403,600	IS	9 Dec 1996	19 Oct 1996
0089	HKG	Distributed control system for air separation plant	180,000	IS	9 Dec 1996	19 Oct 1996
0096	PRC	Nitrogen-hydrogen compressors	1,195,042	ICB	14 Nov 1996	6 Dec 1996
0097	PRC	Raw materials compressors	1,403,000	ICB	14 Nov 1996	6 Dec 1996
0098	PRC	Recycle compressors	505,000	ICB	14 Nov 1996	6 Dec 1996
0108	PRC	Ammonia converter and heat exchanger	344,900	IS	4 Feb 1997	29 Jan 1997
0109	PRC	Water heat recovery system	352,700	IS	4 Feb 1997	29 Jan 1997
0110	PRC	Auxiliary equipment and parts for ammonia converter	386,900	IS	4 Feb 1997	29 Jan 1997
0140	PRC	Travel expenses	12,957	DP	23 Jul 1997	16 Jun 1997
0160	HKG	Distributed control system for ammonia plant	390,500	IS	6 Nov 1997	17vOct 1997
0170	PRC	Travel expenses	19,380	DP	19 Dec 1997	24 Oct 1997
0171	PRC	Transmitting electrical equipment	482,000	IS	19 Dec 1997	30 Oct 1997
0214	HKG	Spare parts for distributed control system	32,339	DP	24 Sep 1999	5 Mar 1999

Number of Contracts
Amount

20
\$ 23,299,999

Table A9.7: Shaanxi Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0001	PRC	Study tour	57,000	DP	14 Nov 1994	8 Nov 1994
0010	JPN	Truck crane	351,795	IS	24 Aug 1995	30 Jun 1995
0019	KOR	Urea plant	8,919,300	ICB	18 Jul 1995	9 Oct 1995
0029	HKG	Hydrogen recovery unit	178,000	IS	22 Feb 1996	11 Jan 1996
0030	PRC	Coal gasifier	782,800	IS	22 Feb 1996	22 Jan 1996
0038	ITA	CO2 (carbon dioxide) removal equipment	327,500	IS	17 Apr 1996	5 Mar 1996
0041	PRC	Nitrogen-hydrogen compressor	1,760,000	ICB	23 Apr 1996	16 May 1996
0042	PRC	Ammonia converter and high pressure equipment	1,180,000	ICB	10 Apr 1996	16 May 1996
0078	USA	Gasification unit	496,500	IS	8 Nov 1996	15 Sep 1996
0099	PRC	Transfer and packing system	597,812	ICB	23 Oct 1996	28 Nov 1996
0100	PRC	Machines and pumps of synthetic ammonia plant	1,300,000	ICB	23 Oct 1996	2 Dec 1996
0104	PRC	Goods, services and training	74,093	DP	6 Jan 1997	5 Nov 1996
0111	PRC	Static equipment in synthetic section	936,000	ICB	13 Dec 1996	22 Jan 1997
0112	PRC	Distributed control system in ammonia plant	518,000	ICB	13 Dec 1996	24 Jan 1997
0117	PRC	Shifting equipment in purification section	1,083,800	ICB	12 Mar 1997	18 Apr 1997
0118	PRC	Desulphuring static equipment in purification section	1,102,170	ICB	12 Mar 1997	26 Apr 1997
0119	PRC	Methane static equipment in purification section	918,406	ICB	17 Mar 1997	19 Apr 1997
0120	PRC	Electrical equipment	758,076	ICB	17 Mar 1997	18 Apr 1997
0132	PRC	Pump system in ammonia and urea plants	212,699	IS	6 Jun 1997	26 Apr 1997
0133	PRC	Materials for gasification unit	425,727	IS	6 Jun 1997	26 Apr 1997
0138	PRC	Static equipment in urea	626,782	ICB	16 Jun 1997	8 Jul 1997
0139	JPN	Energy economy decarbonization pumps	890,000	ICB	16 Jun 1997	8 Jul 1997
0154	PRC	Valves and materials	406,000	IS	15 Sep 1997	16 Aug 1997
0159	PRC	Instrument in purification section	1,098,802	ICB	8 Sep 1997	24 Sep 1997
0165	PRC	CO2 (carbon dioxide) removal unit	1,396,600	ICB	24 Oct 1997	20 Nov 1997
0166	PRC	Utilities equipment	1,860,000	ICB	24 Oct 1997	20 Nov 1997
0170	PRC	Travel expenses for equipment inspection	18,563	DP	19 Dec 1997	24 Oct 1997
0178	PRC	Fellowship	21,382	DP	26 Feb 1998	12 Jan 1998
0184	PRC	Piping materials	307,561	IS	20 Mar 1998	19 Jan 1998
0185	USA	Instruments and materials	490,979	IS	20 Mar 1998	19 Jan 1998
0187	PRC	Synthetic ammonia materials	1,629,439	ICB	15 Mar 1998	26 Mar 1998
0198	PRC	Inspection tour	22,463	DP	7 Oct 1998	1 Sep 1998
0219	PRC	Equipment and spare parts	1,632	DP	22 Aug 2000	21 Jul 2000

Number of Contracts
Amount

30
\$ 30,749,881

Table A9.8: Zhanyi Chemical Fertilizer Plant

PCSS No.	Country of Procurement	Item	\$ Equivalent	Mode of Procurement	Date of Approval	Date of Contract
0009	JPN	Truck crane	353,942	IS	24 Aug 1995	30 Jun 1995
0014	HKG	Pick-up vehicles	82,866	IS	21 Sep 1995	17 Aug 1995
0020	PRC	400 MTPD (metric ton per day) urea plant	8,508,373	ICB	19 Sep 1995	23 Nov 1995
0026	HKG	Hollow fibre membrane separation hydrogen extraction device	161,100	IS	30 Jan 1996	30 Dec 1995
0027	PRC	Construction steel	497,718	IS	30 Jan 1996	30 Dec 1995
0028	PRC	Piping and global vessel materials	897,642	IS	8 Jan 1996	12 Feb 1996
0031	PRC	Copper solution pump, tanning extract, solution desulphuring Screw ammonia compressor	285,500	IS	15 Mar 1996	30 Dec 1995
0032	PRC	Turbine power generator assembly and accessories	208,000	IS	15 Mar 1996	21 Dec 1995
0033	PRC	Instruments and materials	442,476	IS	15 Mar 1996	18 Dec 1995
0034	HKG	Hydrogen-nitrogen gas compressor	1,038,000	ICB	29 Feb 1996	8 Mar 1996
0056	PRC	Ammonia reactor interval and high pressure equipment	1,165,000	ICB	17 May 1996	26 Jun 1996
0057	PRC	Turbine style recycle machine	449,641	IS	15 Mar 1996	13 Jun 1996
0058	PRC	Digital programme control exchanger	165,880	IS	11 Jul 1996	26 Jun 1996
0074	PRC	Travel expenses	10,184	DP	26 Sep 1996	10 Sep 1996
0092	PRC	Stationary equipment for urea plant	234,383	IS	11 Dec 1996	21 Nov 1996
0093	PRC	Rotary equipment	307,177	IS	11 Dec 1996	21 Nov 1996
0094	PRC	Air conditioner	43,845	IS	11 Dec 1996	14 Nov 1996
0095	PRC	Structural steel	348,688	IS	11 Dec 1996	14 Nov 1996
0104	PRC	Goods, services and training	13,188	DP	6 Jan 1997	5 Nov 1996
0105	PRC	Goods, services and training	42,079	DP	6 Jan 1997	10 Dec 1996
0114	PRC	Instrument and electric equipment	478,462	ICB	28 Feb 1997	20 Mar 1997
0155	PRC	Cooling tower	360,000	IS	17 Sep 1997	15 Aug 1997
0156	PRC	Packing and lifting equipment	210,549	IS	17 Sep 1997	15 Aug 1997
0157	PRC	Pumps for ammonia plant	477,965	IS	17 Sep 1997	15 Aug 1997
0158	JPN	Valves and steel plates for ammonia plant	412,629	IS	17 Sep 1997	10 Aug 1997
0167	PRC	Static equipment (medium low-pressure)	899,800	ICB	28 Oct 1997	21 Nov 1997
0168	PRC	Static equipment (hydrogen-nitrogen compressor, CO2 A(carbon dioxide) compressor, rotary machinery	1,064,110	ICB	28 Oct 1997	21 Nov 1997
0169	PRC	Transformer and power cables	276,200	ICB	28 Oct 1997	21 Nov 1997
0170	PRC	Travel expenses for equipment inspection	10,810	DP	19 Dec 1997	24 Oct 1997
0180	PRC	Valves, pipes and fittings	511,290	IS	6 Jan 1998	22 Jan 1998
0189	PRC	Heat exchangers	346,636	IS	24 Aug 1998	11 Aug 1998
0190	PRC	Roads blower	184,972	IS	24 Aug 1998	12 Aug 1998
0191	PRC	Cooling tower	302,503	IS	24 Aug 1998	13 Aug 1997
0208	PRC	Trucks	174,200	IS	16 Jun 1999	8 Jun 1999
0219	PRC	Equipment and spare parts	4,193	DP	22 Aug 2000	21 Jul 2000
Number of Contracts			30			
Amount			\$ 20,970,001			

CAN = Canada, DEN = Denmark, DP = direct purchase, FIN = Finland, GER = Germany, HKG = Hong Kong, China, ICB = international competitive bidding, IS = international shopping, ITA = Italy, JPN = Japan, KOR = Korea, PCSS = procurement contract summary sheet, PRC = People's Republic of China, SIN = Singapore, SWI = Switzerland, USA = United States of America.

FINANCIAL PERFORMANCE OF SUBPROJECT ENTERPRISES
Table A10.1: Financial Performance of Anyang Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	152.78	215.16	270.00	251.22	255.60	318.40	433.39	412.01
Less: Cost of Sales	115.22	153.37	210.39	213.69	213.37	262.33	374.15	370.03
Operating Expenses	25.35	38.89	36.48	30.23	34.39	32.04	38.37	29.92
Operating Income	12.22	22.90	23.14	7.30	7.84	24.02	20.87	12.06
Less: Interest Expense	5.50	9.18	12.94	5.65	7.47	23.94	22.43	14.58
Nonoperating Income/(Expense)	(0.13)	(0.71)	(2.60)	(0.62)	5.56	5.97	2.61	3.56
Net Income Before Tax	6.59	13.01	7.60	1.03	5.93	6.05	1.05	1.03
Net Income After Tax	6.24	8.71	5.10	0.69	3.90	4.06	0.59	0.69
Cash Flow Statements								
Net Income After Tax	6.24	8.71	5.10	0.69	3.90	4.06	0.59	0.69
Add: Depreciation and Amortization	13.03	22.17	21.30	18.68	30.65	30.27	29.86	26.45
Interest Expense	5.50	9.18	12.94	5.65	7.47	23.94	22.43	14.58
Internal Cash Generation	24.77	40.07	39.34	25.01	42.02	58.27	52.88	41.73
Borrowings	64.30	50.16	138.34	206.01	125.87	115.55	105.00	(0.00)
Net Equity Contributions	0.00	0.00	0.00	0.00	79.68	12.00	0.00	262.66
Changes in Working Capital/Other Assets	(11.36)	9.78	(49.19)	(64.97)	260.65	45.53	(27.05)	(196.47)
Total Sources of Funds	77.71	100.01	128.49	166.05	508.23	231.35	130.84	107.92
Capital Expenditures	14.52	103.74	87.13	162.31	512.55	136.64	70.18	71.62
Debt Service	1.94	3.13	7.54	10.99	17.82	47.82	66.70	68.93
Total Application of Funds	75.15	106.87	94.67	173.31	530.37	184.47	136.89	140.56
Changes in Cash	2.55	(6.86)	33.82	(7.26)	(22.14)	46.88	(6.05)	(32.63)
Cash Balance, Beginning of Year	23.44	25.99	19.13	52.95	45.69	23.55	70.43	64.38
Cash Balance, End of Year	25.99	19.13	52.95	45.69	23.55	70.43	64.38	31.74
Balance Sheets								
Current Assets	78.36	126.60	281.05	387.84	228.61	316.41	304.63	308.48
Cash and Deposits	25.99	19.13	52.95	45.69	23.55	70.43	64.38	31.74
Accounts Receivables	0.15	2.79	23.47	17.16	26.24	29.64	22.05	16.09
Notes Receivables	0.00	0.00	0.00	0.00	0.55	13.67	20.50	39.43
Inventories	15.84	19.95	47.53	89.32	44.91	84.96	69.78	48.40
Prepayments and Other Current Assets	36.37	84.72	157.11	235.67	133.36	117.71	127.92	172.82
Net Fixed Assets	104.23	177.38	170.41	149.40	245.22	242.17	238.84	211.63
Construction in Progress	18.47	26.81	98.73	261.61	651.71	755.98	800.49	815.25
Intangibles and Deferred Assets	1.29	1.38	2.26	4.03	0.00	5.16	4.30	61.91
Other Assets	1.55	0.95	1.00	1.00	1.00	1.00	1.00	3.76
Total Assets	203.91	333.12	553.45	803.88	1,126.54	1,320.71	1,349.26	1,401.04
Current Liabilities	84.42	146.80	205.98	258.56	339.44	457.55	389.63	410.47
Accounts Payable	2.89	11.08	30.09	36.17	81.59	107.58	82.76	95.46
Short-Term Loans	32.36	52.15	49.02	62.13	113.11	125.71	162.41	180.08
Notes Payable	0.00	0.00	0.00	1.99	0.00	50.00	1.01	40.00
Others	49.18	83.56	126.87	158.26	144.74	174.27	143.45	94.93
Long-Term Debt	12.78	43.15	184.62	375.53	449.10	480.15	566.91	434.26
Other Noncurrent Liabilities	0.67	0.67	0.67	0.67	0.67	22.68	28.08	29.48
Equity	106.04	142.50	162.17	169.13	337.32	360.33	364.64	526.83
Paid in Capital	82.65	99.12	99.12	99.12	178.80	190.80	190.80	466.85
Surplus, Reserves, and Retained Earnings	23.39	43.38	63.05	70.01	158.52	169.53	173.84	59.98
Total Liabilities and Equity	203.91	333.12	553.45	803.88	1,126.54	1,320.71	1,349.26	1,401.04
Financial Indicators								
Debt Service Coverage Ratio (times)	12.76	12.81	5.22	2.28	2.36	1.22	0.79	0.61
Debt/Debt Plus Equity (percentage of debt)	10.76	23.24	53.24	68.95	57.11	57.13	60.86	45.18

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Anyang Chemical Fertilizer Plant.

Table A10.2: Financial Performance of Guizhou Chemical Fertilizer Plant, 1996–2001
(CNY million)

Year Ending December 31	1996	1997	1998	1999	2000	2001
Income Statements						
Sales	148.51	115.76	110.68	129.16	141.79	120.73
Less: Cost of Sales	122.41	99.58	120.59	118.97	118.05	110.69
Operating Expenses	25.23	27.01	26.24	22.83	24.27	20.70
Operating Income	0.88	(10.83)	(36.16)	(12.64)	(0.53)	(10.66)
Nonoperating Income/(Expense)	0.25	(3.94)	(17.99)	13.67	3.61	10.80
Net Income Before Tax	1.13	(14.76)	(54.15)	1.03	3.08	0.14
Net Income After Tax	0.76	(14.76)	(54.15)	1.03	3.08	0.14
Cash Flow Statements						
Net Income After Tax		(14.76)	(54.15)	1.03	3.08	0.14
Add: Depreciation and Amortization		19.09	17.84	18.47	26.47	22.46
Interest Expense		2.60	4.03	4.20	4.71	5.37
Internal Cash Generation		6.92	(32.28)	23.70	34.26	27.97
Borrowings		67.04	174.54	202.37	117.49	49.94
Net Equity Contributions		0.00	(53.39)	1.00	201.68	(27.78)
Changes in Working Capital/Other Assets		8.27	(58.72)	(12.98)	112.53	(54.63)
Total Sources of Funds		65.70	147.59	240.05	240.90	104.75
Capital Expenditures		45.75	138.66	224.57	105.57	110.62
Debt Service		4.33	10.99	33.75	47.41	61.87
Total Application of Funds		50.08	149.65	258.32	152.99	172.49
Changes in Cash		15.62	(2.06)	(18.27)	87.91	(67.73)
Cash Balance, Beginning of Year		23.12	38.74	36.68	18.41	106.33
Cash Balance, End of Year		38.74	36.68	18.41	106.33	38.59
Balance Sheets						
Current Assets	104.52	149.50	142.19	112.18	299.92	133.89
Cash and Deposits	23.12	38.74	36.68	18.41	106.33	38.59
Accounts Receivables	20.21	21.17	37.86	29.12	30.16	14.46
Notes Receivables	0.00	0.00	0.20	0.05	5.30	3.50
Inventories	24.89	48.98	40.72	38.70	49.79	24.48
Prepayments and Other Current Assets	36.30	40.61	26.72	25.90	108.34	52.87
Net Fixed Assets	159.45	152.69	142.71	147.72	211.78	179.69
Construction in Progress	56.09	89.43	220.24	421.37	335.44	486.09
Intangibles and Deferred Assets	0.00	0.08	0.07	0.03	0.00	70.60
Other Assets	2.22	0.22	0.20	0.20	0.20	0.01
Total Assets	322.27	391.92	505.40	681.50	847.33	870.28
Current Liabilities	74.57	99.12	179.80	172.02	177.00	155.82
Accounts Payable	10.03	3.93	24.99	22.52	25.19	16.68
Short-Term Loans	31.84	43.33	67.18	70.00	78.42	89.42
Notes Payable	0.00	0.00	7.50	7.00	8.00	6.50
Others	32.71	51.86	80.13	72.50	65.40	43.22
Long-term Debt	65.63	121.18	261.08	445.92	410.69	420.80
Other Noncurrent Liabilities	6.91	11.23	11.68	8.68	0.00	0.00
Equity	175.15	160.39	52.85	54.88	259.64	293.66
Paid in Capital	172.15	172.15	118.76	119.76	321.44	293.66
Surplus, Reserves, and Retained Earnings	3.00	(11.76)	(65.91)	(64.88)	(61.80)	0.00
Total Liabilities and Equity	322.27	391.92	505.40	681.50	847.33	870.28
Financial Indicators						
Debt Service Coverage Ratio (times)		1.60	(2.94)	0.70	0.72	0.45
Debt/Debt Plus Equity (percentage of debt)	27.26	43.04	83.17	89.04	61.27	58.90

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.
Source: Guizhou Chemical Fertilizer Plant.

Table A10.3: Financial Performance of Hechi Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	161.57	220.33	247.42	184.52	174.92	195.23	263.73	282.10
Less: Cost of Sales	133.66	163.18	181.81	144.38	131.20	152.85	217.44	252.19
Operating Expenses	9.59	21.72	24.70	12.50	12.44	8.10	14.92	13.08
Operating Income	18.31	35.43	40.91	27.64	31.28	34.27	31.37	16.83
Less: Interest Expense	5.81	7.11	10.72	7.76	5.41	6.24	19.56	30.37
Nonoperating Income/(Expense)	0.83	0.73	1.96	6.15	1.32	1.45	28.79	36.22
Net Income Before Tax	13.32	29.05	32.16	26.04	27.18	29.49	40.60	22.68
Net Income After Tax	8.93	24.54	27.36	22.02	18.23	25.02	37.63	21.03
Cash Flow Statements								
Net Income After Tax	8.93	24.54	27.36	22.02	18.23	25.02	37.63	21.03
Add: Depreciation and Amortization	9.31	9.62	12.61	12.67	11.30	20.10	34.41	37.67
Interest Expense	5.81	7.11	10.72	7.76	5.41	6.24	19.56	30.37
Internal Cash Generation	24.05	41.27	50.69	42.45	34.94	51.37	91.61	89.07
Borrowings	23.00	14.50	3.01	22.89	12.01	316.60	93.31	188.38
Net Equity Contributions	0.00	(3.08)	(11.18)	0.00	4.98	203.93	20.79	(1.98)
Changes in Working Capital/Other Assets	(7.49)	54.33	(28.96)	50.39	66.97	(109.88)	94.98	230.47
Total Sources of Funds	40.13	(1.64)	71.48	14.95	(15.05)	681.77	110.73	45.01
Capital Expenditures	38.90	(11.64)	54.14	24.32	(24.97)	511.91	78.34	20.43
Debt Service	1.40	2.36	7.45	8.85	12.91	49.07	71.84	81.50
Total Application of Funds	40.30	(9.29)	61.59	33.18	(12.06)	560.99	150.19	101.93
Changes in Cash	(0.17)	7.65	9.89	(18.23)	(2.99)	120.79	(39.46)	(56.93)
Cash Balance, Beginning of Year	6.43	6.26	13.91	23.80	5.57	2.58	123.37	83.91
Cash Balance, End of Year	6.26	13.91	23.80	5.57	2.58	123.37	83.91	26.98
Balance Sheets								
Current Assets	82.77	199.11	217.50	189.40	277.18	220.62	178.47	228.63
Cash and Deposits	6.26	13.91	23.80	5.57	2.58	123.37	83.91	26.98
Accounts Receivables	30.49	126.28	142.47	112.28	214.09	31.56	40.54	134.82
Inventories	27.38	37.38	39.21	59.15	55.63	36.49	24.71	56.89
Prepayments and Other Current Assets	18.65	21.54	12.02	12.39	4.87	29.20	29.31	9.94
Net Fixed Assets	74.47	76.99	100.87	101.35	90.37	321.62	550.59	602.66
Construction in Progress	33.97	8.60	26.71	38.36	13.55	274.57	88.45	19.90
Intangibles and Deferred Assets	0.30	1.88	1.41	0.94	0.47	0.00	1.09	0.33
Other Assets	2.11	1.31	0.38	0.25	0.25	0.40	175.11	280.47
Total Assets	193.62	287.89	346.87	330.30	381.81	817.22	993.70	1131.99
Current Liabilities	88.90	163.13	198.02	159.97	193.28	166.78	320.60	426.49
Accounts Payable	2.22	9.63	9.68	12.26	23.35	23.58	17.59	21.53
Short-Term Loans	23.40	39.30	34.41	57.84	66.30	78.30	146.30	286.30
Notes Payable	0.00	0.00	0.00	0.00	5.00	4.80	1.00	0.00
Others	63.28	114.19	153.93	89.88	98.63	60.09	155.72	118.66
Long-Term Debt	4.04	2.64	10.54	10.00	5.00	285.58	280.71	295.25
Other Noncurrent Liabilities	0.00	0.00	0.00	0.00	0.00	2.38	1.19	0.00
Equity	100.68	122.12	138.31	160.32	183.53	362.48	391.20	410.26
Paid in Capital	98.50	98.51	98.51	98.51	98.51	148.51	178.22	178.22
Surplus, Reserves, and Retained Earnings	2.18	23.61	39.79	61.81	85.01	213.97	212.98	232.04
Total Liabilities and Equity	193.62	287.89	346.87	330.30	381.81	817.22	993.70	1131.99
Financial Indicators								
Debt Service Coverage Ratio (times)	17.13	17.50	6.80	4.79	2.71	1.05	1.28	1.09
Debt/Debt Plus Equity (percentage of debt)	3.86	2.12	7.08	5.87	2.65	44.07	41.78	41.85

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Hechi Chemical Fertilizer Plant.

Table A10.4: Financial Performance of Heilongjiang Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	389.75	469.84	415.27	368.88	754.68	800.74	1093.76	1608.15
Less: Cost of Sales	343.64	383.00	341.01	316.61	683.18	721.32	1017.03	1516.53
Operating Expenses	41.10	62.18	55.68	33.75	16.08	50.67	46.44	55.62
Operating Income	5.01	24.66	18.58	18.52	55.42	28.75	30.29	36.00
Less: Interest Expense	5.11	5.69	8.76	16.67	24.94	21.34	17.22	85.01
Nonoperating Income/(Expense)	4.46	(0.90)	4.01	5.62	0.70	(4.49)	(6.95)	20.70
Net Income Before Tax	4.36	18.07	13.83	7.47	31.18	2.92	6.12	(28.31)
Net Income After Tax	2.92	12.11	9.27	5.00	18.20	(22.33)	(7.84)	(33.07)
Cash Flow Statements								
Net Income After Tax	2.92	12.11	9.27	5.00	18.20	(22.33)	(7.84)	(33.07)
Add: Depreciation and Amortization	18.87	26.14	30.84	38.99	82.59	106.81	177.93	178.25
Interest Expense	5.11	5.69	8.76	16.67	24.94	21.34	17.22	85.01
Internal Cash Generation	26.90	43.94	48.87	60.66	125.73	105.82	187.31	230.20
Borrowings		23.05	552.72	819.98	665.41	332.51	(0.00)	90.97
Net Equity Contributions		72.81	121.13	(14.97)	762.50	(99.84)	455.27	(3.79)
Changes in Working Capital/Other Assets		63.77	260.57	87.68	(166.01)	(221.19)	405.74	(36.22)
Total Sources of Funds		76.03	462.15	777.99	1719.66	559.68	236.84	353.60
Capital Expenditures		68.96	330.02	840.59	1365.95	565.26	113.02	161.93
Debt Service		5.69	8.76	16.67	72.85	168.25	176.99	246.46
Total Application of Funds		74.65	338.78	857.26	1438.81	733.51	290.01	408.39
Changes in Cash		1.38	123.37	(79.27)	280.85	(173.83)	(53.17)	(54.79)
Cash Balance, Beginning of Year		7.30	8.68	132.05	52.78	333.63	159.80	106.63
Cash Balance, End of Year		8.68	132.05	52.78	333.63	159.80	106.63	51.84
Balance Sheets								
Current Assets	343.34	456.81	815.81	794.64	1436.51	1549.48	1781.75	1402.13
Cash and Deposits	7.30	8.68	132.05	52.78	333.63	159.80	106.63	51.84
Accounts Receivables	125.65	217.75	249.10	277.54	330.98	428.23	545.21	342.14
Notes Receivables	0.00	7.57	1.75	1.25	0.10	2.60	2.00	0.99
Inventories	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Prepayments and Other Current Assets	210.38	222.80	432.90	463.06	771.79	958.84	1127.90	1007.15
Net Fixed Assets	150.92	209.15	246.73	233.94	806.85	813.15	2846.89	2852.03
Construction in Progress	25.68	36.24	280.30	1087.41	1812.11	2264.25	43.99	22.89
Intangibles and Deferred Assets	9.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Assets	5.44	(10.58)	6.96	14.24	(0.01)	0.00	121.61	121.25
Total Assets	535.33	691.62	1349.80	2130.23	4055.46	4626.88	4794.24	4398.30
Current Liabilities	359.08	426.80	473.75	535.51	830.30	1312.38	1833.65	1374.16
Accounts Payable	212.59	209.94	183.71	149.94	386.52	682.69	589.74	595.98
Short-Term Loans	51.56	69.14	109.57	225.03	274.64	299.24	413.89	472.19
Notes Payable	3.00	4.97	12.50	9.00	15.00	2.50	67.92	11.50
Others	91.93	142.75	167.97	151.54	154.14	327.95	762.10	294.49
Long-term Debt	0.00	3.50	508.26	1216.28	1778.17	1951.67	1147.78	1075.42
Other Noncurrent Liabilities	2.94	3.09	(20.84)	(0.22)	287.63	325.64	328.19	500.95
Equity	173.31	258.23	388.63	378.66	1159.36	1037.19	1484.62	1447.77
Paid in Capital	177.48	185.24	225.15	210.13	572.61	554.08	1111.59	1135.52
Surplus, Reserves, and Retained Earnings	(4.17)	72.99	163.48	168.53	586.75	483.11	373.03	312.25
Total Liabilities and Equity	535.33	691.62	1349.80	2130.23	4055.46	4626.88	4794.24	4398.30
Financial Indicators								
Debt Service Coverage Ratio (times)		7.72	5.58	3.64	1.73	0.63	1.06	0.93
Debt/Debt plus Equity (percentage of debt)		1.34	56.67	76.26	60.53	65.30	43.60	42.62

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Heilongjiang Chemical Fertilizer Plant.

Table A10.5: Financial Performance of Huainan General Chemical Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	348.88	488.23	521.44	451.56	399.88	415.33	495.71	793.56
Less: Cost of Sales	293.08	383.40	420.02	397.23	350.20	358.31	411.92	699.70
Operating Expenses	35.39	71.76	74.53	46.10	46.62	51.06	55.74	54.64
Operating Income	20.42	33.06	26.88	8.23	3.06	5.96	28.04	39.22
Less: Interest Expense	16.26	29.17	0.02	6.39	0.38	0.00	0.00	0.00
Nonoperating Income/(Expense)	(1.27)	1.90	2.48	(0.76)	(0.81)	0.68	0.97	17.47
Net Income Before Tax	2.88	5.79	29.35	1.08	1.87	6.64	29.01	56.69
Net Income After Tax	2.13	4.17	7.73	0.73	1.47	1.52	2.67	16.33
Cash Flow Statements								
Net Income After Tax	2.13	4.17	7.73	0.73	1.47	1.52	2.67	16.33
Add: Depreciation and Amortization	34.57	44.17	47.55	52.19	75.32	71.19	130.15	126.99
Interest Expense	16.26	29.17	0.02	6.39	12.48	12.95	16.03	23.38
Internal Cash Generation	52.96	77.51	55.30	59.31	89.27	85.66	148.85	166.70
Borrowings		(25.70)	211.82	42.28	266.70	281.29	740.15	191.53
Net Equity Contributions		74.05	0.52	2.69	159.57	8.95	(0.00)	2.31
Changes in Working Capital/Other Assets		(42.65)	54.13	169.66	(230.24)	233.98	(235.73)	97.29
Total Sources of Funds		168.52	213.51	(65.38)	745.78	141.92	1124.74	263.25
Capital Expenditures		115.23	97.80	55.92	685.92	(16.88)	962.71	145.78
Debt Service		5.94	7.28	13.85	33.61	104.15	128.23	139.14
Total Application of Funds		121.16	105.08	69.77	719.53	87.26	1090.93	284.92
Changes in Cash		47.35	108.43	(135.15)	26.25	54.66	33.81	(21.68)
Cash Balance, Beginning of Year		17.32	64.67	173.10	37.96	64.20	118.86	152.67
Cash Balance, End of Year		64.67	173.10	37.96	64.20	118.86	152.67	130.99
Balance Sheets								
Current Assets	159.65	209.94	413.47	462.57	286.26	488.82	379.79	354.64
Cash and Deposits	17.32	64.67	173.10	37.96	64.20	118.86	152.67	130.99
Accounts Receivables	36.13	21.11	81.49	84.07	86.09	82.42	71.07	58.15
Notes Receivables	0.00	0.00	15.55	6.82	6.37	7.09	14.32	19.55
Inventories	42.24	52.44	64.21	71.95	86.29	70.52	77.37	63.43
Prepayments and Other Current Assets	63.96	71.72	79.11	261.77	43.30	209.93	64.36	82.51
Net Fixed Assets	276.57	353.39	332.85	313.12	516.25	441.54	1326.07	1278.62
Construction in Progress	37.17	32.90	102.11	118.05	527.46	510.42	451.41	517.99
Intangibles and Deferred Assets	4.20	4.34	3.82	9.62	9.50	9.02	15.74	15.11
Other Assets	13.11	11.47	13.58	15.29	13.49	17.64	17.94	18.24
Total Assets	490.70	612.04	865.82	918.66	1352.95	1467.44	2190.96	2184.60
Current Liabilities	193.17	234.00	280.72	333.12	403.92	390.06	551.47	608.64
Accounts Payable	7.78	5.45	5.86	38.38	68.09	61.83	86.15	31.91
Short-Term Loans	108.85	98.94	111.00	140.32	207.93	215.85	267.16	389.67
Notes Payable	0.00	0.00	0.00	10.00	13.50	14.00	41.35	54.55
Others	76.53	129.61	163.85	144.41	114.39	98.38	156.82	132.51
Long-Term Debt	29.56	37.00	229.50	225.00	399.46	581.14	1130.43	1070.50
Other Noncurrent Liabilities	25.54	20.39	26.70	28.21	56.20	(7.61)	22.83	0.60
Equity	242.42	320.65	328.90	332.33	493.37	503.84	486.23	504.87
Paid in Capital	149.02	149.02	149.02	149.02	379.44	387.64	392.64	387.64
Surplus, Reserves, and Retained Earnings	93.40	171.63	179.88	183.31	113.93	116.20	93.59	117.23
Total Liabilities and Equity	490.70	612.04	865.82	918.66	1352.95	1467.44	2190.96	2184.60
Financial Indicators								
Debt Service Coverage Ratio (times)		13.06	7.60	4.28	2.66	0.82	1.16	1.20
Debt/Debt Plus Equity (percentage of debt)	10.87	10.35	41.10	40.37	44.74	53.56	69.92	67.95

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Huainan Chemical Fertilizer Plant.

Table A10.6: Financial Performance of Pingdingshan Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	126.45	177.79	206.38	189.02	181.39	162.23	281.06	212.32
Less: Cost of Sales	104.44	140.84	165.13	161.52	153.64	134.16	277.90	217.99
Operating Expenses	18.54	27.47	35.63	27.36	24.01	22.07	26.27	10.87
Operating Income	3.47	9.48	5.62	0.14	3.74	6.00	(23.11)	(16.54)
Less: Interest Expense	1.18	2.32	1.35	0.41	2.52	2.35	4.97	12.53
Nonoperating Income/(Expense)	1.36	(1.12)	(0.50)	0.49	(0.93)	(2.78)	7.20	(0.86)
Net Income Before Tax	3.64	6.04	3.78	0.22	0.28	0.87	(20.88)	(29.93)
Net Income After Tax	2.42	3.96	2.54	0.22	0.17	0.42	(20.94)	(29.93)
Cash Flow Statements								
Net Income After Tax	2.42	3.96	2.54	0.22	0.17	0.42	(20.94)	(29.93)
Add: Depreciation and Amortization	15.78	15.99	18.70	17.31	19.05	17.01	47.71	48.89
Interest Expense	1.18	2.32	1.35	0.41	2.52	2.35	4.97	12.53
Internal Cash Generation	19.39	22.27	22.58	17.94	21.75	19.78	31.73	31.49
Borrowings		3.59	112.52	204.29	181.18	81.47	111.38	83.35
Net Equity Contributions		0.14	85.92	(4.88)	1.99	11.18	26.29	11.34
Changes in Working Capital Other Assets		(11.14)	57.05	124.48	(155.12)	(31.13)	(19.89)	(24.55)
Total Sources of Funds		37.14	163.96	92.87	360.03	143.57	189.28	150.73
Capital Expenditures		15.88	88.65	109.97	376.96	81.51	127.50	93.87
Debt Service		2.32	5.67	19.57	18.30	51.98	65.70	74.40
Total Application of Funds		18.20	94.32	129.54	395.26	133.49	193.21	168.27
Changes in Cash		18.94	69.64	(36.67)	(35.23)	10.08	(3.93)	(17.55)
Cash Balance, Beginning of Year		10.05	28.99	98.64	61.97	26.74	36.82	32.89
Cash Balance, End of Year		28.99	98.64	61.97	26.74	36.82	32.89	15.34
BALANCE SHEETS								
Current Assets	59.52	92.11	240.39	330.86	203.39	206.17	155.65	132.70
Cash and Deposits	10.05	28.99	97.52	61.97	26.74	36.82	32.89	15.34
Accounts Receivables	25.04	38.37	63.20	69.46	68.46	40.69	29.92	29.99
Notes Receivables	0.00	0.00	0.00	6.16	12.86	14.30	0.01	0.00
Inventories	15.07	16.00	23.88	130.50	19.12	35.27	23.82	23.00
Prepayments and Other Current Assets	9.37	8.74	55.79	62.77	76.21	79.09	69.00	64.36
Net Fixed Assets	126.28	127.95	149.57	138.50	152.42	136.10	763.30	782.25
Construction in Progress	11.58	9.81	57.58	161.24	505.73	586.64	6.14	32.04
Intangibles and Deferred Assets	0.00	0.00	0.62	0.69	0.65	0.56	33.66	33.80
Other Assets	0.54	0.52	0.47	0.47	0.00	0.00	0.00	0.00
Total Assets	197.91	230.39	448.63	631.75	862.19	929.47	958.75	980.78
Current Liabilities	51.95	77.64	85.65	111.86	184.46	230.99	221.23	263.06
Accounts Payable	1.23	3.46	8.23	29.02	67.06	66.57	60.11	64.33
Short-Term Loans	15.19	19.28	16.40	28.05	34.90	56.40	69.60	92.30
Notes Payable	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00
Others	35.53	54.90	59.91	54.79	82.50	108.02	91.52	106.43
Long-Term Debt	0.50	0.00	109.96	284.56	443.11	453.46	490.90	489.68
Other Noncurrent Liabilities	6.27	9.46	21.27	8.25	5.39	4.18	0.44	0.45
Equity	139.19	143.29	231.75	227.08	229.24	240.84	246.18	227.59
Paid in Capital	84.94	84.94	166.12	160.05	162.04	173.55	175.03	177.54
Surplus, Reserves, and Retained Earnings	54.25	58.35	65.63	67.03	67.20	67.29	71.15	50.06
Total Liabilities and Equity	197.91	230.39	448.63	631.75	862.19	929.47	958.75	980.78
Financial Indicators								
Debt Service Coverage Ratio (times)		9.62	3.99	0.92	1.19	0.38	0.48	0.42
Debt/Debt Plus Equity (percentage of debt)		0.00	32.18	55.62	65.91	65.31	66.60	68.27

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Pingdingshan Chemical Fertilizer Plant.

Table A10.7: Financial Performance of Shaanxi Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	123.29	165.38	176.60	79.40	314.28	356.56	321.28	356.36
Less: Cost of Sales	102.90	124.38	146.73	68.72	263.68	303.39	300.45	325.70
Operating Expenses	19.73	34.20	37.25	2.32	14.75	16.52	10.56	19.90
Operating Income	0.66	6.80	(7.38)	8.36	35.86	36.65	10.28	10.76
Nonoperating Income/(Expense)	0.35	(2.17)	13.87	(0.02)	0.85	0.99	2.45	6.69
Net Income Before Tax	1.01	4.62	6.49	8.34	36.71	37.65	12.72	17.45
Net Income After Tax	0.61	4.62	6.49	8.34	24.71	25.22	8.52	11.63
Cash Flow Statements								
Net Income After Tax		4.62	6.49	8.34	24.71	25.22	8.52	11.63
Add: Depreciation and Amortization		12.10	12.19	15.57	18.19	20.67	23.40	49.05
Interest Expense		0.93	1.75	2.12	1.86	2.28	2.40	1.38
Internal Cash Generation		17.64	20.43	26.04	44.77	48.17	34.32	62.06
Borrowings		2.50	118.33	118.49	170.85	124.38	105.97	(0.00)
Net Equity Contributions		19.85	7.84	41.50	(4.89)	8.13	(15.23)	(225.07)
Changes in Working Capital/Other Assets		(15.67)	58.95	41.25	167.72	58.56	(58.63)	(348.06)
Total Sources of Funds		55.66	87.65	144.78	43.01	122.11	183.70	185.05
Capital Expenditures		28.49	44.46	114.65	80.35	76.36	146.00	138.71
Debt Service		0.93	6.53	7.26	12.89	42.99	56.07	56.54
Total Application of Funds		29.41	50.99	121.92	93.25	119.35	202.07	195.25
Changes in Cash		26.25	36.65	22.86	(50.24)	2.77	(18.37)	(10.20)
Cash Balance, Beginning of Year		7.11	33.36	70.01	92.88	42.64	45.40	27.04
Cash Balance, End of Year		33.36	70.01	92.88	42.64	45.40	27.04	16.84
Balance Sheets								
Current Assets	45.51	82.89	183.19	295.32	540.83	530.33	489.62	105.45
Cash and Deposits	7.11	33.36	70.01	92.88	42.64	45.41	27.04	16.84
Accounts Receivables	0.26	0.11	38.22	18.08	14.24	5.44	98.02	0.40
Notes Receivables	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Inventories	19.62	20.22	27.06	152.66	350.52	361.06	345.20	64.56
Prepayments and Other Current Assets	18.52	29.21	47.89	30.70	133.44	118.42	19.37	23.65
Net Fixed Assets	78.51	96.78	85.33	93.42	90.97	82.68	70.19	561.41
Construction in Progress	13.30	11.49	55.20	146.70	211.30	275.28	410.38	6.11
Intangibles and Deferred Assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72
Other Assets	0.56	0.50	0.50	0.00	0.00	0.00	0.00	0.00
Total Assets	137.88	191.66	324.22	535.44	843.11	888.29	970.20	675.69
Current Liabilities	44.36	75.05	93.44	148.23	271.37	206.54	244.84	201.93
Accounts Payable	9.21	8.36	9.04	55.56	149.57	95.10	55.97	81.66
Short-Term Loans	11.54	15.42	29.13	35.40	31.00	38.00	40.00	23.00
Notes Payable	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00
Others	23.62	51.26	55.28	56.78	90.80	73.45	148.87	97.27
Long-Term Debt	20.50	19.12	118.96	225.55	390.26	466.93	517.24	238.95
Equity	73.02	97.49	111.82	161.66	181.48	214.82	208.12	234.81
Paid in Capital	61.95	69.15	90.80	120.00	120.00	120.00	120.00	120.00
Surplus, Reserves, and Retained Earnings	11.07	28.34	21.02	41.66	61.48	94.82	88.12	114.81
Total Liabilities and Equity	137.88	191.66	324.22	535.44	843.11	888.29	970.20	675.69
Financial Indicators								
Debt Service Coverage Ratio (times)		19.07	3.13	3.58	3.47	1.12	0.61	1.10
Debt/Debt plus Equity (percentage of debt)	21.92	16.40	51.55	58.25	68.26	68.49	71.31	50.44

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Shaanxi Chemical Fertilizer Plant.

Table A10.8: Financial Performance of Zhanyi Chemical Fertilizer Plant, 1994–2001
(CNY million)

Year Ending December 31	1994	1995	1996	1997	1998	1999	2000	2001
Income Statements								
Sales	132.94	222.30	293.09	290.53	262.39	321.28	382.27	456.97
Less: Cost of Sales	125.71	158.70	224.27	239.21	233.95	285.92	328.49	410.05
Operating Expenses	24.86	42.92	46.16	40.89	28.35	36.71	47.99	46.49
Operating Income	(17.62)	20.69	22.66	10.44	0.10	(1.35)	5.79	0.43
Less: Interest Expense	4.00	4.03	3.90	5.27	6.87	6.93	26.63	23.81
Nonoperating Income/(Expense)	29.65	0.39	(0.20)	3.22	7.86	3.33	1.88	4.73
Net Income Before Tax	8.03	17.05	18.57	8.39	1.08	(4.95)	(18.96)	(18.65)
Net Income After Tax	8.03	17.05	12.44	5.71	1.08	(4.95)	(18.96)	(18.65)
Cash Flow Statements								
Net Income After Tax		17.05	12.44	5.71	1.08	(4.95)	(18.96)	(18.65)
Add: Depreciation and Amortization		24.13	25.64	26.33	26.74	29.00	69.56	66.02
Interest Expense		4.03	3.90	5.27	6.87	6.93	26.63	23.81
Internal Cash Generation		45.21	41.97	37.31	34.70	30.97	77.23	71.18
Borrowings		56.11	114.50	179.32	125.52	108.36	121.36	(0.00)
Net Equity Contributions		(6.26)	8.29	9.80	12.29	2.20	(13.17)	127.65
Changes in Working Capital/Other Assets		(10.40)	(19.03)	40.30	15.84	(15.56)	17.35	141.60
Total Sources of Funds		105.47	183.79	186.13	156.67	157.10	168.07	57.24
Capital Expenditures		44.01	152.90	206.05	181.06	110.47	76.87	3.53
Debt Service		4.03	7.03	10.95	15.94	37.92	66.27	67.29
Total Application of Funds		48.05	159.94	217.00	197.00	148.38	143.14	70.82
Changes in Cash		57.42	23.85	(30.87)	(40.33)	8.72	24.93	(13.58)
Cash Balance, Beginning of Year		10.44	67.86	91.72	60.85	20.52	29.24	54.17
Cash Balance, End of Year		67.86	91.72	60.85	20.52	29.24	54.17	40.59
Balance Sheets								
Current Assets	72.59	136.53	163.49	212.21	207.96	201.49	239.88	172.35
Cash and Deposits	10.44	67.86	91.72	60.85	20.52	29.24	54.17	40.59
Accounts Receivables	10.45	12.21	12.56	56.20	83.41	87.20	68.49	65.22
Notes Receivables	0.00	0.00	1.22	4.18	1.45	6.01	1.35	2.10
Inventories	38.43	32.30	40.45	72.27	83.84	62.82	92.63	47.88
Prepayments and Other Current Assets	13.27	24.16	17.54	18.70	18.74	16.22	23.25	16.57
Net Fixed Assets	210.41	193.04	205.11	210.62	213.95	173.98	730.13	673.58
Construction in Progress	58.92	104.00	199.18	368.06	498.86	604.85	46.70	44.18
Intangibles and Deferred Assets	5.11	7.74	4.02	7.43	16.51	20.27	19.84	3.59
Other Assets	16.39	5.93	29.68	31.58	42.70	54.39	64.13	76.97
Total Assets	363.43	447.24	601.47	829.91	979.98	1054.97	1100.69	970.66
Current Liabilities	85.29	110.00	139.52	200.64	283.45	312.97	342.89	292.70
Accounts Payable	14.67	19.63	21.02	55.28	86.67	85.67	90.40	93.60
Short-Term Loans	23.64	28.83	36.13	58.00	113.00	149.00	182.80	121.80
Notes Payable	0.00	0.00	0.00	0.00	7.11	0.00	0.00	0.00
Others	46.99	61.55	82.37	87.36	76.66	78.30	69.69	77.30
Long-Term Debt	20.34	71.26	175.32	327.09	381.43	429.92	477.84	289.00
Other Noncurrent Liabilities	3.37	0.77	0.68	0.72	0.26	0.00	0.00	0.00
Equity	254.43	265.22	285.94	301.46	314.83	312.09	279.96	388.96
Paid in Capital	14.81	147.35	144.35	154.45	166.04	176.45	180.64	387.37
Surplus, Reserves, and Retained Earnings	239.62	117.87	141.59	147.01	148.79	135.64	99.32	1.59
Total Liabilities and Equity	363.43	447.24	601.47	829.91	979.98	1054.97	1100.69	970.66
Financial Indicators								
Debt Service Coverage Ratio (times)		11.21	5.97	3.41	2.18	0.82	1.17	1.06
Debt/Debt Plus Equity (percentage of debt)	7.40	21.18	38.01	52.04	54.78	57.94	63.06	42.63

Note: Accounts are for the combined operations of the company. Cash flow statements were reconstructed from available accounts.

Source: Zhanyi Chemical Fertilizer Plant.

FINANCIAL EVALUATION

A. General

1. The financial internal rate of return (FIRR) was reevaluated on the basis of financial data and assumptions provided by the enterprises. Capital costs were based on actual investments made for the Fertilizer Industry Restructuring Project. Incremental revenues were determined from the sales of urea and other by-products. Incremental operations and maintenance costs were based on actual costs presented in the financial statements and adjusted to reflect assumed production levels and product mix. As at appraisal, the economic life of the subprojects was assumed for 16 years with zero residual value. All revenues and expenditures are in constant 2001 prices and exclude depreciation and interest.

B. Capital Costs

2. Capital costs were based on actual costs provided by the enterprises and the annual disbursement record of the Asian Development Bank. Additional investments to be made by the enterprises for making future renovations, improving project facilities, and restructuring the product mix to produce higher-priced products that are in greater demand were also included. The enterprises consider these investments as least cost options for improving the utilization of the project facilities, energy, and raw materials. These investments will affect the sustainability of the subprojects; however, some enterprises did not assume any further capital expenditures in their projections because of shortages of funds and uncertainty about obtaining the required funding for the planned investments. Future investments were considered only for the Hechi, Chemical Fertilizer Plant (HCFP), the Heilongjiang Chemical Fertilizer Plant (HLFP), and the Pdingshan Chemical Fertilizer Plant (PCFP).

C. Revenues and Production Costs

3. The projected revenues were computed on the basis of full capacity operation of the project facilities. The calculations assumed that the enterprises have been producing or will produce other high value-added refined products associated with ammonia and urea to improve their profitability. The 2002 price of urea in the subproject area was used in the calculations and was assumed to increase by 3% per year until 2005 following the rising trend in the international price of urea projected by the World Bank for 2002–2010. The prices are assumed to remain constant from 2005 onward.

4. Actual operation costs of the subprojects show that coal and electricity accounted for 60% to 70% of the production costs. The price of coal in the People's Republic of China has increased since the time of appraisal because of increasing demand and the closure of small mines by the Government. While the domestic price of coal is expected to drop in the future because of increased coal imports and reduced coal exports, notwithstanding the declining international price of coal projected by the World Bank, the projections assumed the current level of production costs.

D. Financial Internal Rate of Return

5. The FIRRs of the eight subprojects were recalculated at 8.6% for the Anyang Chemical Fertilizer Plant (ACFP), 6.6% for the Guizhou Chemical Fertilizer Plant (GCFP), 11.6% for HCFP, 5.4% for HLCP, 7.6% for the Huainan General Chemical Plant (HGCP), 9.9% for PCFP, 6.6% for the Shaanxi Chemical Fertilizer Plant (SCFP), and 11.6% for the Zhanyi Chemical Fertilizer Plant (ZCFP). These are low compared with the FIRRs estimated at appraisal of

14.8%, 22.9%, and 23.9% for ACFP, HCFP, and PCFP, respectively. The reduced FIRR are mainly due to the lower price of urea resulting from weak demand and strong competition. Actual investment costs were also substantially higher than appraisal estimates, as the cost assumptions used then appear to have been inadequate. The prevailing cost of coal, which is the main input cost for feedstock, and of fuel, has increased from the appraisal level because of increasing demand and the closure of small coal mines by the Government. The continuing low price of the main output, urea, and the high cost of the main input, coal, threatens the financial viability of the subprojects. Improvements in the price of urea, diversification of the product mix to produce higher-value products, and introduction of changes in the production process to bring down production costs will be necessary to improve profitability.

6. The FIRRs of the subprojects are still higher than their weighted average cost of capital (WACC), except for HLCP. However, HGCP and SCFP do not meet the requirement that the FIRR should exceed the WACC by at least 2%. The overall FIRR of 8.8 % is higher than the 5.8% WACC for the whole Project by 3.0%.

E. Weighted Average Costs of Capital

7. The estimated WACC for the subprojects, after taxes, in real terms, was derived following the methodology in the Revised Financial Management Guidelines using actual capital mix and costs of funds. The real interest costs of loan funds were considered, while the cost of equity was assumed to be 12%. Actual income tax rates were assumed. The standard income tax rate in the PRC is 33%, but preferential rates are given in some inland provinces. Domestic inflation is assumed at 3% per year. The WACCs calculated at appraisal assumed higher costs of debt and equity as well as higher inflation rates.

Table A11.1: Financial Internal Rates of Return, 1993–2010
(CNY million)

Year Ending December 31	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010—
Anyang Chemical Fertilizer Plant																		
Capital Investment		51.97	56.07	151.13	158.74	101.02	35.17	93.22										
Net Revenue After Tax							28.77	26.61	15.16	67.87	95.16	106.24	117.78	117.78	117.78	117.78	117.78	117.78
Net Cash Flow		(51.97)	(56.07)	(151.13)	(158.74)	(101.02)	(6.40)	(66.61)	15.16	67.87	95.16	106.24	117.78	117.78	117.78	117.78	117.78	117.78
FIRR		8.6%																
WACC		5.4%																
Guizhou Chemical Fertilizer Plant																		
Capital Investment			0.90	27.54	22.56	99.98	127.71	80.17	90.48									
Net Revenue After Tax										31.96	45.90	53.03	55.05	55.05	55.05	55.05	55.05	55.05
Net Cash Flow			(0.90)	(27.54)	(22.56)	(99.98)	(127.71)	(80.17)	(90.48)	31.96	45.90	53.03	55.05	55.05	55.05	55.05	55.05	55.05
FIRR		6.6%																
WACC		4.3%																
Hechi Chemical Fertilizer Plant																		
Capital Investment			47.58	137.49	104.20	92.70	43.38	133.80			20.00	57.71						
Net Revenue After Tax							12.10	58.54	47.75	36.58	40.57	73.23	153.90	153.90	153.90	153.90	153.90	153.90
Net Cash Flow			(47.58)	(137.49)	(104.20)	(92.70)	(31.28)	(75.26)	47.75	36.58	20.57	15.52	153.90	153.90	153.90	153.90	153.90	153.90
FIRR		11.6%																
WACC		6.0%																
Heilongjiang Chemical Fertilizer Plant																		
Capital Investment			44.35	199.63	728.01	277.51	60.24	14.71			67.58							
Net Revenue After Tax							47.87	47.87	65.76	92.47	157.03	172.21	165.17	165.17	165.17	165.17	165.17	165.17
Net Cash Flow			(44.35)	(199.63)	(728.01)	(277.51)	(60.24)	33.16	65.76	24.89	157.03	172.21	165.17	165.17	165.17	165.17	165.17	165.17
FIRR		5.4%																
WACC		5.8%																
Huainan Chemical Fertilizer Plant																		
Capital Investment			3.08	48.01	176.66	497.95	294.72	250.20	64.59									
Net Revenue After Tax							17.31	17.31	92.98	162.86	174.63	182.22	190.03	190.03	190.03	190.03	190.03	190.03
Net Cash Flow			(3.08)	(48.01)	(176.66)	(497.95)	(294.72)	(232.89)	28.39	162.86	174.63	182.22	190.03	190.03	190.03	190.03	190.03	190.03
FIRR		7.6%																
WACC		6.5%																
Pingdingshan Chemical Fertilizer Plant																		
Capital Investment			14.31	135.69	199.39	118.86	33.01	67.88			45.00							
Net Revenue After Tax							14.09	8.61	3.01	20.81	123.89	129.14	135.42	127.94	127.94	127.94	127.94	127.94
Net Cash Flow			(14.31)	(135.69)	(199.39)	(118.86)	(18.92)	(59.26)	3.01	(24.19)	123.89	129.14	135.42	127.94	127.94	127.94	127.94	127.94
FIRR		9.9%																
WACC		5.4%																
Shaanxi Chemical Fertilizer Plant																		
Capital Investment		0.61	8.05	126.45	107.52	141.90	101.48	118.09	45.00									
Net Revenue After Tax							10.82	10.82	40.78	72.21	76.10	80.11	84.23	84.23	84.23	84.23	84.23	84.23
Net Cash Flow		(0.61)	(8.05)	(126.45)	(107.52)	(141.90)	(101.48)	(107.27)	(4.22)	72.21	76.10	80.11	84.23	84.23	84.23	84.23	84.23	84.23
FIRR		6.6%																
WACC		6.2%																
Zhanyi Chemical Fertilizer Plant																		
Capital Investment	27.94	24.00	34.91	98.08	126.35	65.51	48.17	38.15	19.51									
Net Revenue After Tax			6.71	10.78	6.76	17.09	38.12	61.38	66.25	72.73	76.77	80.94	85.22	85.22	85.22	85.22	85.22	73.11
Net Cash Flow	(27.94)	(24.00)	(28.20)	(87.30)	(119.59)	(48.42)	(10.05)	23.23	46.74	72.73	76.77	80.94	85.22	85.22	85.22	85.22	85.22	73.11
FIRR	11.6%																	
WACC	5.4%																	
Overall																		
Capital Investment	27.94	76.58	209.25	924.02	1,623.43	1,395.43	743.88	796.22	219.58	112.58	20.00	57.71	0.00	0.00	0.00	0.00	0.00	0.00
Net Revenue After Tax			6.71	10.78	6.76	17.09	93.09	231.15	331.68	557.47	790.04	877.11	986.81	979.33	979.33	979.33	979.33	967.22
Net Cash Flow	(27.94)	(76.58)	(202.54)	(913.24)	(1,616.67)	(1,378.34)	(650.79)	(565.07)	112.10	444.89	770.04	819.40	986.81	979.33	979.33	979.33	979.33	967.22
FIRR	8.8%																	
WACC	5.8%																	

FIRR = financial internal rate of return, WACC = weighted average cost of capital.

ECONOMIC EVALUATION

A. General

1. The economic evaluation of the Fertilizer Industry Restructuring Project was carried out following the same methodology that was used in the appraisal. Incremental costs and benefits were determined for each subproject to determine the net benefit stream. The economic life of the Project is assumed to be 16 years after full commercial operations. The residual value at the end of the economic life is assumed to be zero. All prices and costs are expressed in 2001 values.

B. Costs and Benefits

2. The economic capital costs of the subprojects were derived from the actual financial cost components and converted to their economic values by applying the conversion factors¹ commonly used for projects in the People's Republic of China. Imported equipment was valued at its international price plus transport and handling costs from the port to the project site. Local equipment was translated into its economic price by using the appropriate conversion factor. Nontradable items were converted to their economic values by using the standard conversion factor of 0.93. Taxes, import duties, and all financial charges, including interest during construction, have been excluded. The economic benefits were derived from the sales of urea and other by-products. The prices for imported urea (discounted by 5% to account for the lower quality of indigenous urea), including transport and handling costs to the project site, were used. The benefits derived from other by-products were measured from their financial values and converted by applying the standard conversion factor. The price of coal was expressed in cost, insurance, and freight price to the project site. Other cost components were translated into economic costs by applying the standard conversion factor.

C. Economic Internal Rates of Return

3. The economic internal rate of return (EIRR) is recalculated at 13.6% for the Anyang Chemical Fertilizer Plant, 10.9% for the Guizhou Chemical Fertilizer Plant, 14.7% for the Hechi Chemical Fertilizer Plant, 10.5% for the Heilongjiang Chemical Fertilizer Plant, 14.4% for the Huainan General Chemical Plant, 15.2% for the Pingdingshan Chemical Fertilizer Plant, 10.3% for the Shaanxi Chemical Fertilizer Plant, and 13.9% for the Zhanyi Chemical Fertilizer Plant. The overall EIRR for the whole project is 12.5%. The EIRRs estimated at appraisal were 14.3%, 15.3%, and 17.2% for the Anyang, Hechi, and Pingdingshan plants, respectively. The low EIRRs are primarily due to higher investment costs coupled with implementation delays, higher input costs, and reduced benefits as a result of lower urea prices. Nevertheless, the overall EIRR of 12.5% is still higher than the economic opportunity cost of capital of 12%.

¹ The conversion factors used in this evaluation are 1.1 for civil works, 1.1 for local machinery, and 0.93 for others.

Table A12.1: Economic Internal Rates of Return
(CNY million)

Year Ending December 31	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010—
Anyang Chemical Fertilizer Plant																		
Capital Investment		55.46	59.84	161.29	169.41	107.81	37.53	99.49										
Benefit							55.31	116.06	40.78	107.56	146.75	155.31	170.19	170.19	170.19	170.19	170.19	170.19
Net Benefits		(55.46)	(59.84)	(161.29)	(169.41)	(107.81)	17.78	16.57	40.78	107.56	146.75	155.31	170.19	170.19	170.19	170.19	170.19	170.19
EIRR	13.6%																	
Guizhou Chemical Fertilizer Plant																		
Capital Investment			1.00	30.41	24.91	110.41	141.04	88.54	99.93									
Benefit										56.26	75.33	85.32	88.53	88.53	88.53	88.53	88.53	88.53
Net Benefits			(1.00)	(30.41)	(24.91)	(110.41)	(141.04)	(88.54)	(99.93)	56.26	75.33	85.32	88.53	88.53	88.53	88.53	88.53	88.53
EIRR	10.9%																	
Hechi Chemical Fertilizer Plant																		
Capital Investment			53.22	162.40	120.47	104.95	44.08	145.68			18.52	53.44						
Benefit							18.16	74.28	61.14	51.07	58.78	225.39	205.35	205.35	205.35	205.35	205.35	205.35
Net Benefits			(53.22)	(162.40)	(120.47)	(104.95)	(25.92)	(71.40)	61.14	51.07	40.26	171.95	205.35	205.35	205.35	205.35	205.35	205.35
EIRR	14.7%																	
Heilongjiang Chemical Fertilizer Plant																		
Capital Investment			47.52	213.88	779.99	297.33	64.54	15.76		45.00								
Benefit								82.13	127.88	180.03	252.17	283.83	302.56	302.56	302.56	302.56	302.56	302.56
Net Benefits			(47.52)	(213.88)	(779.99)	(297.33)	(64.54)	66.37	127.88	135.03	252.17	283.83	302.56	302.56	302.56	302.56	302.56	302.56
EIRR	10.5%																	
Huainan Chemical Fertilizer Plant																		
Capital Investment			2.99	46.68	171.75	484.09	288.52	245.07	64.31									
Benefit							29.26	151.63	255.30	272.68	287.14	302.04	302.04	302.04	302.04	302.04	302.04	302.04
Net Benefits			(2.99)	(46.68)	(171.75)	(484.09)	(288.52)	(215.81)	87.32	255.30	272.68	287.14	302.04	302.04	302.04	302.04	302.04	302.04
EIRR	14.4%																	
Pingdingshan Chemical Fertilizer Plant																		
Capital Investment			28.18	202.79	136.63	105.31	38.51	68.17		45.00								
Benefit							34.15	24.95	9.89	43.05	195.25	209.18	209.18	198.15	198.15	198.15	198.15	190.22
Net Benefits			(28.18)	(202.79)	(136.63)	(105.31)	(4.36)	(43.22)	9.89	(1.95)	195.25	209.18	209.18	198.15	198.15	198.15	198.15	190.22
EIRR	15.2%																	
Shaanxi Chemical Fertilizer Plant																		
Capital Investment		0.59	7.78	122.23	103.93	137.16	98.09	114.18	43.50									
Benefit								15.75	53.25	84.68	90.67	103.37	113.04	113.04	113.04	113.04	113.04	113.04
Net Benefits		(0.59)	(7.78)	(122.23)	(103.93)	(137.16)	(98.09)	(98.43)	9.75	84.68	90.67	103.37	113.04	113.04	113.04	113.04	113.04	113.04
EIRR	10.3%																	
Zhanyi Chemical Fertilizer Plant																		
Capital Investment	28.59	24.55	35.72	100.34	129.27	67.03	49.28	39.03	38.76									
Benefit			9.07	19.02	17.41	27.79	53.11	66.94	75.01	79.79	85.84	92.08	98.50	98.50	98.50	98.50	98.50	81.50
Net Benefits	(28.59)	(24.55)	(26.65)	(81.32)	(111.86)	(39.24)	3.83	27.91	36.25	79.79	85.84	92.08	98.50	98.50	98.50	98.50	98.50	81.50
EIRR	13.9%																	
Overall																		
Capital Investment	28.59	80.60	236.25	1,040.02	1,636.36	1,414.09	761.59	815.92	246.50	90.00	18.52	53.44						
Benefit	0.00	0.00	9.07	19.02	17.41	27.79	160.73	409.37	519.59	857.74	1,177.47	1,441.62	1,489.39	1,478.35	1,478.35	1,478.35	1,478.35	1,453.43
Net Benefits	(28.59)	(80.60)	(227.18)	(1,021.00)	(1,618.95)	(1,386.30)	(600.86)	(406.55)	273.09	767.74	1,158.95	1,388.18	1,489.39	1,478.35	1,478.35	1,478.35	1,478.35	1,453.43
EIRR	12.5%																	

EIRR = economic internal rate of return.

ACTUAL INVESTMENT IN ENVIRONMENTAL IMPROVEMENTS
(\$ million)

Plant	Amount of Investment
ACFP	5.34
GCFP	5.42
HCFP	8.93
HGCP	5.51
HLCP	13.46
PCFP	3.13
SCFP	5.51
ZCFP	0.38
Total	47.68

ACFP = Anyang Chemical Fertilizer Plant, GCFP = Guizhou Chemical Fertilizer Plant, HCFP = Hechi Chemical Fertilizer Plant, HGCP = Huainan General Chemical Plant, HLCP = Heilongjiang Chemical Plant, PCFP = Pingdingshan Chemical Fertilizer Plant, SCFP = Shaanxi Chemical Fertilizer Plant, ZCFP = Zhanyi Chemical Fertilizer Plant.

**TRAINING PROVIDED UNDER THE PROJECT
(Technical and Administrative)**

Type	No. of People	No. of Person-Days
Overseas Training		
Anyang	15	1,014
Guizhou	46	135
Hechi	43	3,219
Heilongjiang	8	145
Huainan	42	63
Pingdingshan	98	1,211
Shaanxi	40	597
Zhanyi	17	535
Total	309	6,919
Local Training		
Anyang	98	490
Guizhou	204	1,020
Hechi	308	7,212
Heilongjiang	187	935
Huainan	516	2,163
Pingdingshan	406	2,030
Shaanxi	88	7,320
Zhanyi	153	6,885
Total	1,960	28,055
Grand Total	2,269	34,974