

# INTEGRATING ECONOMIC DEVELOPMENT AND ENVIRONMENTAL PROTECTION IN CHINA DURING THE 10<sup>TH</sup> FIVE-YEAR PLAN PERIOD (2001-2005)

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## 1. Introduction

1. Since China adopted its “open door” policy in the late 1970s, it has achieved rapid economic growth and undertaken modernisation of its industrial sector, both of which have attracted worldwide attention. Rapid economic growth has contributed greatly to improving the living standard of the Chinese people but at the same time it has also generated severe environmental problems of increased pollution and destruction of natural environments. The government recognises that the 10<sup>th</sup> five-year plan period (2001-2005) is the beginning of the third phase in the country’s development strategy and a critical time for strengthening its commitment to sustainable development. This paper examines projected trends in China’s economic development and environmental management during the period 2001-2005, and discusses the demand for environmental investments to achieve the environmental goals identified in the 10<sup>th</sup> five-year plan.

## 2. Trends in Economic and Social Development in China

### 2.1 *Economic Development and Structural Changes*

#### 2.1.1 *National Economic Development*

2. Since 1978, China’s economy has grown rapidly. For example:

- in 1999 China’s GDP was 8205.4 billion yuan (about US\$991 billion)<sup>1</sup>, which was 21.6 times higher than that in 1978 (at current prices);
- between 1978 and 1999, annual average GDP growth rate was 12%, and for the first 4 years of the 9<sup>th</sup> five-year plan period (1996-2000) the annual average GDP growth rate was 8.45%;
- in 1978 per capita GDP was 379 yuan (approximately US\$46). By 1999 this had increased to 6,504 yuan (about \$786); and
- between 1980 and 1999 the annual average growth rate of gross industrial output value was about 13%. During the 8<sup>th</sup> five-year plan period (1991-1995) this figure reached 17.8%.

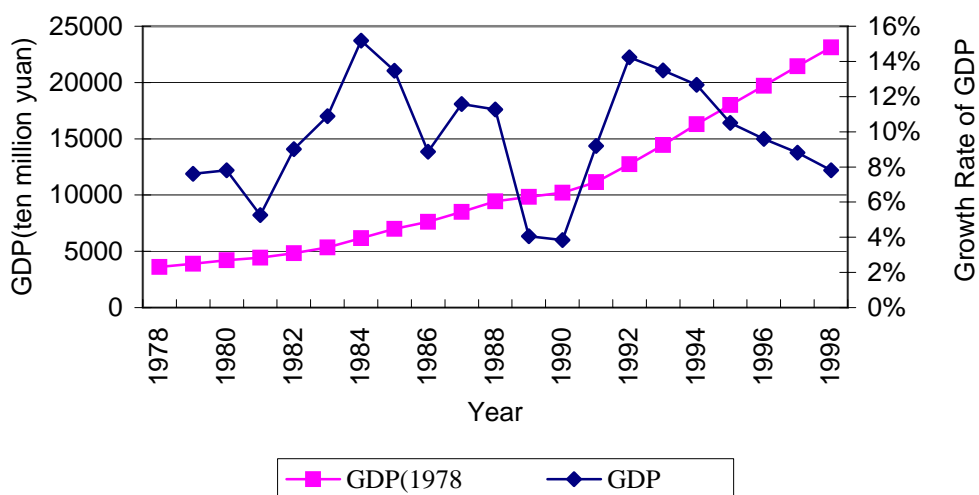
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<sup>1</sup> US\$1 = 8.2770 yuan <<<http://www.bloomberg.com/markets/wcv1.html>>> accessed 2 November 2000.

3. Figure 1 shows the trend in GDP and in the rate of GDP growth between 1978 and 1998.

Figure 1: GDP and Rate of Growth in GDP for China, 1978-1998



Source: Zeng (1999; 2000).

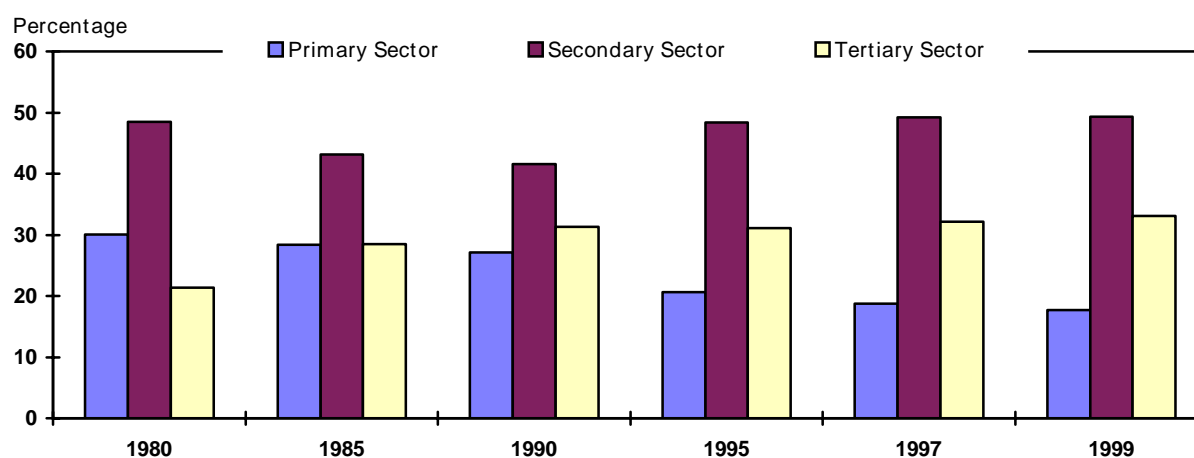
4. Since 1992, however, the pace of domestic economic growth has slowed due to several factors: inflation, the flow-on effects of the Asian financial crisis and deflation. For example, the annual rate of GDP growth was 14.2% in 1992 but fell to 7.2% in 1999. The gradual economic recovery that is occurring in Asia from the impacts of the 1997-98 financial crisis as well as the effects of the Chinese government's macro-economic policies to stimulate domestic demand are expected to underpin a better economic performance by China in 2000. Indicators such as the volume of exports and imports and amount of industry and tax revenue collected have all shown significant improvement. Indeed, in the first half of 2000 China's GDP was 8.2%, which was higher than in the first half of 1999<sup>2</sup>.

### 2.1.2 Changes in Economic Structure

5. Since China began its economic reforms, the structure of its economy has changed considerably. In general terms, the share of the service sector in the economy has increased, the share of the primary sector (e.g. agriculture) has decreased gradually and the share of the secondary sector (e.g. mining and processing) has remained about the same (see Figure 2). For example, in 1999 the contribution of the secondary sector to GDP was 49.27% while that of the primary sector was 17.68% and of the services sector was 33.05%. Clearly, the secondary sector currently remains the most important contributor to China's economy.

<sup>2</sup> <<<http://www.stats.gov.cn/news/jmtj/jm2000/news0718.htm>>>

**Figure 2: Changes in the Structure of China's Economy, 1980-1999**



Sources: State Statistics Bureau (1986; 1998); Zeng (1999; 2000).

### 2.1.3 Output of Major Industrial Products

6. In 1998, the total output of key industrial products included:

- 115.59 million tons of steel;
- 536 million tons of cement;
- 1.25 billion tons of coal; and
- 161 million tons of crude oil.

7. Data on selected agricultural and industrial indicators of China are presented in Table 1.

### 2.1.4 Revenue and Expenditure

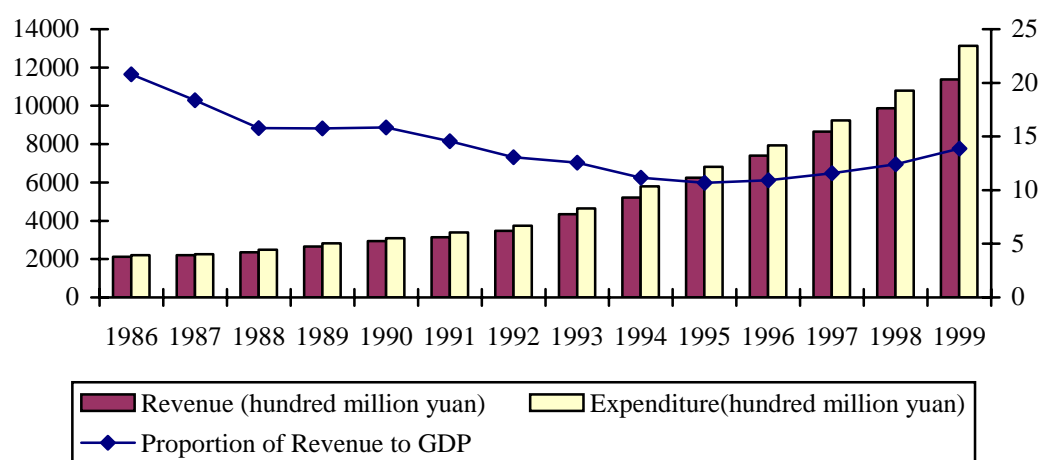
8. Over the last 20 years, the ratio of revenue to GDP in China has trended down: in 1978 the ration was 31.24% but in 1999 it had fallen to 13.86% (see Figure 3). This trend decrease has directly undermined the capacity of the central government to reform and regulate the economy at the macro-level. In 1999, the total revenue collected in China amounted to 1137.7 billion yuan, which was 105.3% of the targeted amount in the budget (the sum collected was 15.2% higher than that for 1998). On the other hand, total expenditure in 1999 was 1,313.7 billion yuan, which was 104.2% of the budget target (and 21.7% higher than that for 1998). The financial deficit of the central government in 1999 amounted to 176 billion yuan, accounting for 2.19% of GDP.

**Table 1: Selected Agricultural and Industrial Indicators of China Compared World Figures**

<b>Indicator</b>	<b>Year</b>	<b>Unit</b>	<b>Output in China</b>	<b>World Output</b>	<b>Share of China's Output to Total World Output (%)</b>
GDP	1997	US\$ billion	902	28,977	3.1
Total prodn. of cereals	1998	Thousand tons	456,247	2,057,984	2.2
Total prodn. of meat	1998	Thousand tons	57,238	216,201	2.6
Prodn. of chemical fertiliser	1997	Thousand tons	28,210	149,965	1.89
Prodn. of chemical pesticides	1997	Thousand tons	526	n.a.	n.a.
Primary energy production	1995	Thousand tons of standard coal	1,290,340	12,321,830	10.5
Installed power generation capacity	1995	Thousand kilowatts		3,058,394	
Total prodn. of steel	1996	Thousand tons	101,240	699,000	14.5
Total prodn. of coal	1996	Thousand tons	1,397,000	4,763,550	29.3
Total prodn. of crude oil	1996	Thousand tons	157,330	3,113,330	5.05
Total power generation	1996	Billion kilowatt hours	1,081.3	13,745.7	7.87
Total prodn. of cement	1996	Thousand tons	491,190	1,507,600	32.58
Prodn. of automobiles	1997		1,582,500	55,176,000	2.87
Household tv sets	1996	Thousand	35,418	137,141	25.83

Sources: World Bank, 1999; FAO, 1999; International Statistical Yearbook, 1999.

**Figure 3: Revenue, Expenditure and Percentage of Revenue to GDP in China, 1986-1999**



9. To increase domestic demand and stimulate economic growth, the government issued bonds to the value of 331 billion yuan and 401.5 billion yuan respectively in 1998 and 1999. It is estimated that the total value of government bonds to be issued in 2000 will be 438 billion yuan. The revenue raised by the 1998 and 1999 bonds gave impetus to urban environmental infrastructure development and investments in environmental protection. For example, in 1999 the government funded 543 environmental projects related to urban environmental infrastructure, pollution abatement in the priority “three rivers and three lakes”, environmental improvements in Beijing<sup>3</sup> and promotion of a domestic environmental goods and services industry. The total amount of investment was 162.2 billion yuan, of which 32.5 billion was sourced from revenue raised by the sale of bonds. By the end of 1999, 38% of total investment in these projects had been made and they had contributed to stimulating domestic demand and economic growth (Wang et al., 2000).

### 2.1.5 Changes in the Ownership Structure of Industrial Enterprises

10. The domestic economic reform process in China and associated closer integration into the world economy has greatly facilitated structural change in the ownership of industrial enterprises. In 1998, there were 7,974,565 industrial enterprises in China and their gross output value amounted to 11,904.8 billion yuan (at current prices). Foreign investors owned 10,717 of these enterprises. Those owned by investors from Hong Kong, Macao and Chinese Taipei totaled 15,725. Output value amounted to 845.8 billion yuan for foreign-owned enterprises and 829.9 billion yuan for those owned by investors from Hong Kong, Macau and Chinese Taipei.

11. In terms of the share in industrial output value, the contribution of state-owned enterprises has trended down while that of collectively owned and privately owned enterprises has steadily increased (see Table 2). The proportion of non-state owned enterprises in 1998 was 72%. The contribution of township and village enterprises (TVEs) is particularly notable. In 1999, TVEs contributed 30% of GDP, 49% of industrial output, 38% of exported commodities, 64% of value-added in rural areas and 34% of farmers'

<sup>3</sup> The “three rivers and three lakes” are priority watersheds for environmental protection identified in the 9<sup>th</sup> five-year plan. They refer to the Huaihe River, Haihe River and Liaohe River and Taihu Lake, Dianchi Lake and Chaohu Lake. Beijing is also one of the priority regions identified in the 9<sup>th</sup> five-year plan.

income. There are 68,000 township and village industrial enterprises (TVIEs) whose sales revenue is more than 5 million yuan. Of this number, more than 8,000 are large- or medium-sized enterprises<sup>4</sup>.

12. The structural change in enterprise ownership that has occurred has had significant implications for the transition from a planned to market-based economy. It has added dynamism to the economy and yielded important economic benefits. Table 2 summarises aspects of this structural change for the period 1994 to 1998.

**Table 2: Structural Changes in China's Industrial Sector, 1994-1998**

	1994	1995	1996	1997	1998
Number of Enterprises and Breakdown by Ownership (thousand)					
Total Number	10 017.1	7 341.0	7 986.5	7 922.9	7 974.6
SOEs	102.2	118.0	127.6	110.0	64.7
Collectively owned enterprises	1 863.0	1 475.0	1 591.8	1 772.3	1 797.8
Privately owned enterprises	8 004.7	5 688.2	6 210.7	5 974.7	6 033.8
Others	44.5	60.3	70.2	77.3	85.7
Industrial Output Value of Enterprises under Different Forms of Ownership (billion yuan)					
Gross output value	7 017.6	9 189.4	9 959.5	11 373.3	11 904.8
SOEs	2 620.1	3 122.0	3 617.3	3 596.8	3 362.1
Collectively owned Enterprises	2 647.2	3 362.3	3 923.2	4 334.7	4 573.0
Privately owned enterprises	708.2	1 182.1	1 542.0	2 037.6	2 037.2
Others	1 042.1	1 523.1	1 658.2	2 098.2	2 727.0

#### 2.1.6 Reform of State-Owned Enterprises (SOEs)

13. Although the share of SOEs in the national economy has been declining, they still play an important role in providing employment and a source of revenue as well as advancing science and technology. Reform of SOEs has been a major, albeit difficult, aspect of economic reform in China. In 1998, the State Council affirmed that SOEs would be profitable within three years. In the last two years some progress has been made in SOE reform; for example, in 1999 total losses incurred by these enterprises were 15.9% lower than in 1998 and sectors such as textiles, construction materials, non-ferrous metal and railways returned a profit (Zeng, 2000). Indeed, in 1999 the SOEs returned a profit of 70 billion yuan, which was 40% higher than the set target. In the first five months of 2000, the SOEs returned a profit of 69.2 billion yuan, an increase of 3.1 times that for the same period in 1999. Nevertheless, it is a major challenge for all SOEs to return a profit. Some loss-making SOEs continue to under-perform, incurring losses of 42 billion yuan in the first five months of 2000 (Chen, Huai, 2000).

#### 2.1.7 China's Positive Role During the Asian Financial Crisis

14. The ripple effects of the Asian financial crisis that began in July 1997 impacted heavily on China. First, it resulted in a dramatic reduction in exports. The total value of exports in 1997 and 1998 amounted

<sup>4</sup> <<<http://finance.sina.com.cn>>>, accessed 8 July 2000 .

to US\$ 182.79 billion and US\$ 183.76 billion respectively, a very modest increase. Second, it led to a significant decline in domestic demand and the pace of economic growth slowed. As of December 1999, input costs, retail price index of consumer goods and the consumer price index had dropped for 45 months, 27 months and 22 months respectively. The government took a highly responsible attitude in responding to the financial crisis and reducing its impacts by implementing policies such as issuing bonds, stabilising the currency exchange rate, reducing interest rates on savings and loans and stimulating household consumption. In addition, the government arranged more than US\$ 4.9 billion in assistance to the most severely affected countries and resisted pressure to devalue the yuan. These actions contributed positively to stabilising the effects of the crisis and in assisting regional economic recovery.

### *2.1.8 Reform of the Banking System*

15. The Asian financial crisis has subsided but financial risks still exist in China. In 1999, total loans owed to financial institutions in China amounted to 9373.4 billion yuan. Of this sum, new loans issued in 1999 totaled 1084.6 billion yuan, or 64.5 billion yuan less than the amount provided in 1998. As a share of the total amount of loans, banks lent 78.6% to state-owned banks, with 61% of this being accounted for by four commercial banks owned exclusively by the state<sup>5</sup>. The most serious problem with state-owned banks is their high percentage of bad debts. With approval from the State Council, four debt management companies were established in 1999: China Xinda, Huarong, Changcheng and Dongfang Debt Management Company. These companies have purchased the bad debts of the four commercial banks owned exclusively by the state and they have so far settled 350 billion yuan of outstanding debt (Ma, 2000). The debt management companies can utilise a variety of approaches in their operations: recovery of debts, redefining creditor's rights and reforming liabilities by issuing shares and securities.

16. Driven by the expected admission of China to the WTO in the near future, the country is accelerating the opening of its banking sector. By the end of 1999, 87 foreign financial institutions and business groups from 22 countries/regions had established 182 financial-sector businesses in China. In addition, 166 banks from 38 countries/regions had set up 248 resident offices in China. The total asset value of foreign banks in China amounts to US\$ 31.8 billion (about 263.3 billion yuan), which accounts for 2% of the total assets of the banking sector in China. It should also be noted that Chinese state-owned banks and insurance companies have increased their presence overseas, represented by over 600 branches (Ma, 2000).

### *2.1.9 Development of a Securities Market*

17. China's securities market dates from 1988. At present, there are a number of securities traded in the market: A shares, B shares, government bonds, corporate bonds and investment funds. In 1990 there were only ten stocks but now there are 1039 (of which over 30 are environmentally-related). The average annual growth rate has been 59.1%. The value of share trading in the secondary market was 68.1 billion yuan in 1992 and increased to 3131.9 billion yuan in 1999, with an average annual growth rate of 72.79%. In 1992, 38 bonds were traded in the market and this increased to 40 in 1999. The volume of bond trade was 8.732 billion yuan in 1993, increasing to 1819.354 billion yuan in 1999 and with an average annual growth rate of 13.01%. At present, there are 22 investment funds traded on the stock exchange. The

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<sup>5</sup> Commercial banks owned exclusively by the state are the China Industrial and Commercial Bank, China Construction Bank, China Agriculture Bank and Bank of China. Eleven joint-stock commercial banks have also been established, including the Transportation Bank, China International Trade and Investment Corporation (CITIC) Industrial Bank, China Everbright Bank, Huaxia Bank and China Merchants Bank. Policy banks in China include the China Development Bank, China Agriculture Development Bank and China Export and Import Bank.



volume of trade in investment funds was 35.749 billion yuan in 1994 and increased to 77.364 billion yuan in 1999. According to statistical data for 1999, of 899 listed companies their average ratio of liabilities to assets was 48.64% and the net earning rate for each share was 3.96% (Zheng, 2000).

### 2.1.10 Development of an Insurance Market

18. At the end of 1999, there were 28 insurance companies established in China, including 8 that were joint ventures between local and foreign investors and another 7 that were funded exclusively by foreign investors. The total income from insurance premium payments was 640 million yuan in 1980 and this had increased to 139.322 billion yuan in 1999. The annual growth rate was 32.75%. In 1999, the depth of insurance (the ratio of insurance income to GDP) was 1.7% and the density of insurance (insurance premium per capita) was 110.6 yuan. Compared with the international insurance market, China's is still at an initial stage of development<sup>6</sup>. The total assets of all insurance companies in China amounts to over 240 billion yuan and the liability rate of assets is as high as 90.7%. Once China joins the WTO the country's insurance sector is expected to be subject to fierce competition.

## 2.2 Social Development Challenges

### 2.2.1 Population Growth and Urbanisation

19. In 1999 China's population was 1.23 billion, with an increase of 10.99 million persons in that year alone. Table 3 indicates the pressures that such a large population exerts on the country's natural resources. Between the 6<sup>th</sup> five-year plan period 1981-85) and the 8<sup>th</sup> five-year plan period (1991-95) the pace of urbanisation in China accelerated. During the 9<sup>th</sup> five-year plan period (1996-2000), China's annual rate of growth in urbanisation was 0.40%-0.47%. By 1999, the urbanisation level was 30.9% and the urban population totaled 389.03 million. One implication of the growing density of urbanisation is that the share of urban domestic pollution in the total pollution load now exceeds 50%. As a result, the development of urban environmental infrastructure is a priority area for investment.

**Table 3: Pressures on Natural Resources**

Indicators	Unit	Year	China	World	Share of China to the World (%)
Population	Million	1998	1 239	5 897	21
Per capita volume of freshwater	m <sup>3</sup>	1996	2 304	8 338	28
Per capita area of arable land	ha.	1998	0.10	0.24	42
Per capita area of forest	ha.	1998	0.11	0.90	12
Per capita energy consumption	Kg oil equivalent	1996	902	1 684	54
Per capita CO <sub>2</sub> emissions	Ton	1996	2.8	4	70

Sources: International Statistical Yearbook, 1999; World Bank, 2000.

<sup>6</sup> In 1997 the average depth of insurance on a global basis was 3.06%. China's figure that year was 1.46%, which ranked it 62<sup>nd</sup> in the world. The average density of insurance worldwide in 1997 was \$176.8 while that for China was \$10.9. On this basis China was ranked 77<sup>th</sup> in the world.

### 2.2.2 Regional Variations in Economic Development

20. There is wide variation in economic development between the different regions in China and the gap is steadily increasing. This difference is reflected in indicators such as per capita GDP, per capita income and household expenditure, per capita energy consumption and pollution discharge. Table 4 illustrates the differences that are emerging by reference to data on the eastern, central and western parts of China.<sup>7</sup> To narrow the gap among the regions the government initiated the West China Development Strategy in 1999, which aims to redirect investment towards this area and away from the coastal regions in the east that have to date been the principal targets for investors.

**Table 4: Indicators of Economic Development for Different Regions, 1997-1998**

Indicators	Unit	Year	Eastern China	Central China	Western China	Total
Population	Million	1998	523	440	285	1,248*
GDP	Billion yuan	1998	4811.5	2311.4	1155.2	8278
GDP per capita	Yuan	1998	9200	5253	4053	6633
Per capita income of urban households	Yuan	1997	6313	4340	4511	5189
Per capita income of rural households	Yuan	1997	3896	2518		2999

\* This figure differs slightly from that in Table 3.  
Sources: Luo et al., 2000; Chen Yao, 2000.

### 2.2.3 Regional Variation in Volumes of Pollution Discharge

21. Differences in economic development among the regions are also reflected in variation in the level of pollution discharge per unit of production. To illustrate this, Table 5 presents selected indicators of economic development and industrial pollution discharge for different regions across a number of. This indicates that the share of industrial pollution discharge in central and western China to total industrial pollution discharge is increasing.

22. An important indicator that relates economic development to industrial pollution discharge is the intensity of industrial pollutant discharge per unit of output value. Table 6 compares this for eastern, central, and western China. The table shows that the “move to the east” of the economic centre and the “move to the west” of industrial pollution have resulted in a fan-like pattern in the level of industrial pollutant discharge. In both 1995 and 1998 the intensity of industrial pollutant discharge broadened in moving from eastern China to the centre and on to western China (Cao et al., 1999).

23. The Chinese government is currently finalising the country’s 10<sup>th</sup> five-year plan of social and economic development. The draft plan prepared by the State Council will be submitted to the 2001 meeting of the National People’s Congress for discussion and approval. In this context, the comments in this section are tentative. They are based on the authors’ analysis of published literature and research

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7. Eastern China includes 12 provinces/municipalities/autonomous regions: Liaoning, Shandong, Beijing, Tianjin, Hebei, Jiangsu, Zhejiang, Shanghai, Fujian, Guangdong, Guangxi and Hainan. Central China groups 9 provinces/autonomous regions: Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan. Western China includes 10 provinces/municipalities/autonomous regions: Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang. In the West China Development Strategy, “West China” is defined to include Guangxi and Inner Mongolia in addition to the 10 provinces/municipalities/autonomous regions.

undertaken to support preparation of the plan. A fuller commentary can only be provided when both the plan and the longer-term plan to 2010 are released next year

**Table 5: Comparison of Industrial Pollution Discharge between Eastern, Central and Western China**

Indicators	Year	Eastern China	Central China	Western China	Total
GDP (billion yuan)	1990	2 043.4	1 139.9	616.3	3 799.6
	1998	4 811.5	2 311.4	1 155.2	8 278.1
Gross industrial output value (billion yuan)	1990	1 500.4	607.1	284.9	2 392.4
	1995	6 064.9	2 188.8	935.7	9 189.4
	1998	7 866.9	2 964.3	1 073.6	11 904.8
Industrial COD discharge (thousand tons)	1990	5 554	2 885	1 355	9 794
	1995	6 939	4 662	2 196	13 797
	1998	4 127	2 414	1 464	8 005
Industrial SO <sub>2</sub> discharge (thousand tons)	1990	8 204	4 634	2 875	15 713
	1995	9 211	4 956	4 295	18 462
	1998	7 810	4 603	3 531	15 944
Industrial smoke dust discharge (thousand Tons)	1990	6 036	5 199	2 046	13 281
	1995	6 817	6 445	3 613	16 875
	1998	4 305	4 263	3 218	11 786

Note: Both GDP and gross industrial output value are in current prices.

Sources: China Environmental Statistical Data, 1981-1990; Editorial Committee of China Environment Yearbook, 1991, 1992, 1996, 1999; State Statistics Bureau, 1991, 1999.

**Table 6: Comparison of Intensity of Industrial Pollutant Discharge between Eastern, Central and Western China (Unit: kg/ten thousand yuan)**

Indicators	Year	Eastern China	Central China	Western China	Total
Intensity of COD discharge	1990	37.0	47.5	47.6	132.1
	1995	11.4	21.3	23.5	56.2
	1998	5.2	8.1	13.6	26.9
Intensity of SO <sub>2</sub> discharge	1990	54.7	76.3	100.9	231.9
	1995	15.2	22.6	45.3	83.1
	1998	9.9	15.5	32.9	58.3
Intensity of smoke dust discharge	1990	40.2	85.6	71.8	197.6
	1995	11.2	29.4	38.6	79.2
	1998	5.5	14.4	30.0	49.9

### 2.3 *Social and Economic Development in the 10<sup>th</sup> Five-year Plan Period (2001-2005): Challenges and Opportunities*

#### 2.3.1 *Contextual Factors*

24. A number of factors contextualise the outlook for China's social and economic development in the next 5 years. They include:

- the impact of weak domestic demand as an inhibiting factor on economic growth, with implications for employment. Since 1997, for example, the number of new jobs created by TVEs has fallen by 5 million;

- income growth in rural and some urban areas has been slow and the gap in development between these areas and between different regions of the country is growing. In addition, the income gap among the urban population is increasing;
- reform of economic and sectoral policies needs to be deepened but presents considerable political challenges. The reform of SOEs remains difficult, the social security system is under stress and the administrative framework of government is struggling to adapt to the requirements of a market economy;
- the difficulty of integrating economic, environmental and population policy goals. The ageing of China's population poses challenges on the economic (e.g. smaller tax base) and social welfare (e.g. healthcare, housing) fronts. Rapid economic growth has generated increased pollution and investment in environmental protection falls short of needs;
- China's expected entry into the WTO and economic globalisation are new challenges to social and economic development, and will test the adequacy of the country's legal framework (e.g. contract law).

25. On the other hand, a number of favourable factors should support implementation of the 10<sup>th</sup> five-year plan. They include:

- a solid foundation for future development has been laid through the achievements of reform efforts undertaken to date;
- the large population provides a strong labour force and a great potential market for goods and services;
- the industrial modernisation process underway provides an opportunity to restructure the industry sector to improve both its economic and environmental performance;
- new information technology and the process of economic globalisation can help improve the efficiency of resource allocation.

### 2.3.2 *Targets of, and Strategies for, Social and Economic Development during the 10<sup>th</sup> Five-year Plan Period*

26. China has established preliminary targets of social and economic development during the 10<sup>th</sup> five-year plan period. Major targets include:

- strengthening the country's economic power. The annual GDP growth rate is expected to be about 7% and the goal is to have China ranked in the top 5 economies in the world by 2005;
- accelerating the development of the central and western regions. In these regions, goals include a 35% level of urbanisation, an increase by 30% in productivity and growth in the share of hi-tech industry in GDP;
- improving further the quality of life for the population. It is expected that the annual growth rate of per capita disposable income of the urban and rural population will be about 5%;
- intensifying efforts to limit the total population at about 1.33 billion. Employment opportunities will need to be expanded so that 35 million more people can be employed;
- improving urban and rural environmental quality and slowing the rate of destruction of natural habitats. Forest coverage should reach 18.2%.

27. The government will implement five strategies to achieve these targets. They will focus on enlarging domestic demand, promoting vigorously the western China development strategy, encouraging further urbanisation, revitalising China through science and education and strengthening the commitment to sustainable development. To support these strategies, in addition to the 10<sup>th</sup> five-year plan the State Council will also promote nine specific plans. They are the urbanisation development plan; the population, employment and social security plan; the science and educational development plan; the nature conservation and environmental protection plan; the comprehensive plan for water resource management;

the plan for the development of an integrated transportation system; the energy development plan; the western China development strategy plan; and the information technology industry development plan.

### 2.3.2 Preliminary Projections of Economic Development, 2000-2010

28. Several organisations have projected that China's GDP will grow at 7%-8% annually during the 10<sup>th</sup> five-year plan period (Chinese Academy of Social Sciences, 2000; State Council, 1999; World Bank, 1997). Table 7 summarises three scenarios of annual economic growth up to 2010 (the end of the 11<sup>th</sup> five-year plan period): low annual growth of 7%, medium growth of 7.5% and high growth of 8%. On this basis, China's GDP in 2005 could be 12325.6 billion yuan or 12616.3 billion yuan or even 12900 billion yuan under the low, medium and high scenarios. By 2010 these figures could be 17287.3 billion yuan, 17694.9 billion yuan and 18093.4 billion yuan respectively under the same scenarios.

**Table 7: Projected GDP under Three Alternative Scenarios, 2000-2010**

Year	Unit	High Growth Rate (8%)	Medium Growth Rate (7.5%)	Low Growth Rate (7%)
2000	Billion yuan	8 788.0	8 788.0	8 788.0
2001	Billion yuan	9 482.1	9 447.1	9 403.1
2002	Billion yuan	10 240.7	10 155.6	10 061.3
2003	Billion yuan	11 059.9	10 917.3	10 765.6
2004	Billion yuan	11 944.7	11 736.1	11 519.2
2005	Billion yuan	12 900.0	12 616.3	12 325.6
<b>Total for the 10<sup>th</sup> Five-Year Plan Period</b>	<b>Billion yuan</b>	<b>55 627.4</b>	<b>54 872.4</b>	<b>54 074.8</b>
2006	Billion yuan	13 803.4	13 499.4	13 188.4
2007	Billion yuan	14 769.6	14 444.3	14 111.5
2008	Billion yuan	15 803.5	15 455.4	15 099.3
2009	Billion yuan	16 909.7	16 537.3	16 156.3
2010	Billion yuan	18 093.4	17 694.9	17 287.3
<b>Total for the 11<sup>th</sup> Five-Year Plan Period</b>	<b>Billion yuan</b>	<b>79 379.6</b>	<b>77 631.3</b>	<b>75 842.8</b>

### 3. Environmental Management during the 10<sup>th</sup> Five-year Plan Period: Broad Contours

29. At the moment, the State Environmental Protection Administration (SEPA) is developing the 10<sup>th</sup> National Five-year Plan for Environmental Protection and the Outline of Environmental Targets to 2015 (referred to hereinafter as the 10<sup>th</sup> Five-Year Plan for Environmental Protection). This section presents the main lines of this plan as presently drafted.

#### 3.1 Environmental Goals and Targets

30. On the basis of experience gained from the implementation and achievements of the 9<sup>th</sup> National Five-year Plan for Environmental Protection, the overall goals during the next five years will be to reduce

further all forms of pollution, to slow the trend in destruction of natural habitats, to improve environmental quality in major municipalities and regions and to refine environmental legislation and resource management strategies. Table 8 lists the specific targets to be achieved and indicators of their fulfillment.

### **3.2 Key Regions for Environmental Protection**

31. In the 9<sup>th</sup> five-year plan period the government identified a number of important regions/river basins for environmental protection. They are known as the “three rivers” (Huaihe River, Haihe River, and Liaohe River) and the “three lakes” (Lake Taihu, Lake Chaohu and Lake Dianchi). In addition, other priority areas were identified comprising two zones (an acid rain control zone and a SO<sub>2</sub> control zone), one municipality (Beijing) and one marine area (Bohai Sea). To build on the progress in pollution prevention and control in the three rivers and three lakes, further efforts will be made during the 10<sup>th</sup> five-year plan period. In addition, the Yangtze River basin (the focal point of which is Three Gorges Reservoir Area and its upper waters) and the Yellow River basin (concentrating on the XiaoLangdi Reservoir Area and its upper waters) have been placed on the list of important regions/river basins to receive priority attention during the 10<sup>th</sup> five-year plan period. And the number of major municipalities that will be targeted for environmental improvements has now increased to 100. Improved environmental management in these regions, river basins and municipalities is critical for China to achieve sustainable development in the 21st Century. Also, they can play an important demonstration role for future projects.

#### **3.2.1 Three Gorges Reservoir Area and Its Upper Waters**

32. The main targets of environmental protection efforts include:

- to establish a number of special ecological zones in the source area of the Yangtze River to protect the natural values and habitats;
- to strengthen environmental protection in Sichuan Province, and in this context to ensure that inflows from Jinshajiang River, Mintuojiang River and Jialingjiang River account for about 50% of the total volume of water in the whole river basin, to reduce by 10% the volume of sediment flowing into the Yangtze River and to guarantee that water in the main currents flowing out of Sichuan Province meet Grade II water standard;
- to promote integrated pollution control in Chongqing municipality, and on this basis to strengthen environmental protection in the Three Gorges Reservoir Area so that water quality meets Grade II standard and water entering the reservoir meets Grade III standard. In addition, the Three Gorges Reservoir should be able to operate safely for the foreseeable future;
- to accelerate the construction of urban wastewater treatment plants and waste treatment plants in the Three Gorges Reservoir Area so that the rate of wastewater treatment reaches 75%, the rate of waste treatment is 80% and there is no discharge of hazardous waste.

**Table 8: Environmental Targets and Indicators, 2001-2005**

Issue	Specific Targets and Indicators
Environmental protection in river basins	80% of state-controlled sections of the Yangtze River river basin and the Pearl River basin will meet Grade III standard for surface water quality and water in the Three Gorges Reservoir Area will meet Grade II standard. 50% of state-controlled sections of the Yellow River river basin and the Songhuajiang River basin will meet Grade III standard for surface water quality and 40% will be of Grade IV standard. Sections under state control in the Huaihe River, Haihe River, Liaohe River, Lake Taihu, Lake Dianchi and Lake Chaohu will meet the standards for surface water quality set in accordance with environmental treatment plans approved by the State Council. In all state-controlled sections there will be no water of Grade V standard.
Acid rain and SO <sub>2</sub> control	Acid deposition across China will be reduced to some extent to decrease acid rain pollution. The areas affected by acid rain where the pH of precipitation is lower than 4.5 will become fewer. The SO <sub>2</sub> concentration in urban air within the “Acid Rain Control Zone” and the “SO <sub>2</sub> Control Zone” will meet Grade II standard for air quality.
Urban environmental protection	Air quality of defined medium- and large-sized municipalities will meet Grade II air standard. Surface water quality in defined medium- and large-sized municipalities will meet national standards corresponding to their zoning for environmental functions. In defined medium- and large-sized municipalities, road transportation noise and regional noise will meet the relevant national standards. Water quality of all centralised potable water sources in urban areas will meet the relevant national standard. In major municipalities of high priority for environmental protection, air quality, surface water quality and noise will meet the relevant standards corresponding to the zoning of their environmental functions. A number of demonstration projects will be established in defined municipalities or urban communities. The rate of centralised sewage treatment in urban areas nationally will reach 50%. 50% of urban households will use gas. The rate of urban refuse treatment will reach 75%.
Total pollutant discharge control	Further progress is to be made on the basis of the achievements made in terms of “one ‘control’, and two ‘meeting standards’” during the 9 <sup>th</sup> five-year plan period. The total amount of SO <sub>2</sub> emissions will be capped at 20,280,000 tons. Total smoke dust discharge will be limited to 13,600,000 tons. Total industrial dust discharge will be restricted to 12,560,000 tons. Total COD discharge will be limited to 12,320,000 tons. Total industrial solid waste will not exceed 75.5 million tons.
Ecological protection	A number of reserves with special ecological functions, nature reserves and demonstration areas are to be set aside in ecological zones that have been severely degraded and areas rich in biodiversity. The total number of nature reserves will be 1200, the area of nature reserves will reach 11.2 million hectares so that the total area of nature reserves in China will account for 13% of the total land area. The rate of forestry coverage nation-wide will reach 18.2%. The total area of land subject to desertification and soil and water loss will remain at the level of the year 2000. The rate of recovery and treatment of areas suffering from ecological destruction resulting from mineral resource exploitation will be at least 25%.
Rural environmental protection	Rural areas that provide potable water sources are to be protected. Pollution from agricultural sources is to be more vigorously addressed. Total nitrogen and total phosphorus discharge in Lake Taihu, Lake Dianchi and Lake Chaohu are to be limited to the level of the year 2000. 90% of sewage discharge from intensive plant culture operations/farms in major areas is to meet the relevant national standard. Regulations prohibiting straw burning in rural areas will be strongly enforced.



### 3.2.2. *Xiaolangdi Reservoir Area and Its Upper Waters in the Yellow River Basin*

33. The major targets of environmental protection in this area include:

- to strengthen water conservation efforts in the river's source area in Qinghai and Gansu provinces and to ensure that the volume of water in this area will not be less than the average level;
- to strengthen water and soil conservation in the Loess Plateau area and to reduce by 10% the volume of sediment flowing into the Yellow River; and
- to progressively phase out enterprises using obsolete technologies and production processes, strengthen pollution treatment in ore mining and treatment enterprises and to ensure that water in the Sanmenxia and Xiaolangdi reservoirs meet Grade III standards for surface water.

### 3.2.3 *The Three Rivers*

34. The major environmental targets have been defined as:

- in the Huaihe River basin, the volume of COD entering the river in 2005 will be limited to 368,000 tons a year and the whole water body will progressively become cleaner;
- in the Haihe River basin, the total volume of COD discharge in 2005 will be restricted to 1,030,000 tons a year and water used as potable water supply will meet national standards for surface water quality; and
- in the Liaohe River basin, the volume of COD discharge in 2005 is not to exceed 240,000 tons a year.

### 3.2.3 *The Three Lakes*

35. The principle environmental targets to be reached in 2005 are:

- for Lake Taihu, total COD discharge is to be limited to 194,938 tons a year, total nitrogen discharge is not to exceed 13,023 tons a year, total phosphorus is to be restricted to 3470 tons a year and water quality in rivers flowing into or out of the lake is to be close to Grade III standard for surface water;
- for Lake Dianchi, total COD discharge is to be limited to 7177 tons a year, total nitrogen discharge limited to 5012 tons a year, total phosphorus discharge restricted to 514 tons a year and water quality in Waihai is to meet Grade III standard for surface water. Water quality in Caohai is to be close to Grade IV standard for surface water;
- for Lake Chaohu, total COD discharge is capped at 59231 tons a year, total nitrogen discharge limited to 11351 tons a year, total phosphorus discharge limited to 1072 tons a year and the quality of water entering the lake is to meet or almost meet Grade III standards for surface water. Water flowing out of the lake is to meet Grade III standards.

### 3.2.4 *Acid Rain Control Zone and SO<sub>2</sub> Control Zone*

36. In 2005, the limit on SO<sub>2</sub> emissions in the "two control zones" is to be 10,280,000 tons and sulphur deposition nation-wide is to be reduced to some extent. Acid rain pollution in the acid rain control zone is to be reduced. The area affected by precipitation of pH less than 4.5 will be 5% less than that during the 8<sup>th</sup> five-year plan period. By 2005, SO<sub>2</sub> concentration in urban air within the "two control zones" will meet Grade II standard for air quality.

### 3.2.5 *Beijing Municipality*

37. Beijing municipality will aim to integrate social, economic and environmental development objectives. By 2005, water quality, air quality and noise levels in Beijing are to meet the relevant national standards. Environmental damage is to be reduced and the natural environment in some surrounding counties and regions will be improved. In addition, environmental investments in Hebei Province, Inner Mongolia Autonomous Region and Tianjin Municipality will be increased to indirectly improve environmental quality in Beijing.

### 3.2.6 *Bohai Sea*

38. By 2005, the total volume of COD entering the Bohai Sea will be limited to 3,389,000 tons, and total nitrogen and total phosphorus input will be restricted to 107,000 tons and 87,000 tons respectively. Environmental pollution and ecological damage will also be brought under control.

### 3.2.7 *Major Municipalities*

39. The major targets for environmental protection in these areas include:

- the 47 major municipalities and municipalities identified in the 9<sup>th</sup> five-year plan period and which host demonstration projects are to strengthen their efforts concerning the “one control and two meeting standards”. Water and air quality, and noise levels in these municipalities are to conform to the relevant national standards;
- in the 53 major municipalities that have been added to the priority list, water and air quality, and noise levels are to meet national standards; and
- all 100 major municipalities are to install an automatic air quality monitoring system and transmit the data by satellite to the competent national authority.

## 3.3 *Five Major Tasks in Environmental Protection*

### 3.3.1 *Task 1: To Strengthen Industrial Pollution Control*

40. During the 10<sup>th</sup> five-year plan period industrial pollution control will remain the top priority. China is to adopt the following actions:

- strengthen the implementation and enforcement of environmental legislation as it relates to industrial pollution control;
- progressively phase out or shut down a defined number of enterprises that are highly energy-intensive and resource consuming, emit a high level of pollutants and have low productivity;
- require that a selected number of major polluting industrial enterprises shall control their emissions within a prescribed time;
- modernise or modify a number of large- and medium-sized SOEs and promote cleaner production approaches therein;
- in combination with land use planning controls, relocate secondary industries from the core of urban areas and promote their replacement by service industries;
- strengthen pollution prevention and control in the coal, power, metallurgy, chemicals, construction, pulp and paper, tanning and brewing industries. In addition, restructuring of the industry sector is to be undertaken and will include the integration of environmental considerations.

### 3.3.2 *Task 2: To Improve Urban Environmental Quality*

41. Intensified efforts will be made to improve the quality of the urban environment. This will include better protection of public health, the provision of more environmental infrastructure, measures to improve air and potable water quality and the promotion of cleaner fuels. Major actions in this regard include:

- mobilising public support and raising funds from multiple sources to accelerate construction of urban environmental infrastructure such as district heating schemes, gas supply, wastewater treatment facilities, facilities for comprehensive waste management and establishment of public green spaces;
- prioritising the protection of potable water sources used by urban residents;
- distributing gas and power from the west to the east of the country and changing the structure of fuel used in cities towards cleaner sources, such as natural gas;
- stressing comprehensive environmental management in the 100 key municipalities, publishing daily a set of environmental indicators in these municipalities and experimenting with a system to forecast urban environmental quality;
- promoting public transport, encouraging the development and use of clean fuels and strengthening the use of unleaded petrol.

### 3.3.3 *Task 3: To Reduce the Degradation of the Natural Environment*

42. The following actions are proposed during the 10<sup>th</sup> five-year plan period:

- mapping of ecological zones in every province and autonomous region to accelerate the development of a national plan for natural areas management and protection;
- strengthening the integration of environmental considerations in economic policies for the western China region, consistent with the priority placed on robust environmental management in this area;
- establishing 10 national reserves with special ecological functions. This includes the headwaters of major rivers, key water and soil conservation areas, storage areas for floodwater overflow and areas providing wind-shelter and sand-traps;
- ensuring that nature conservation projects in the Talimu River basin and the area bounded by Shanxi and Shaanxi provinces and Inner Mongolia autonomous region are implemented;
- increasing the number and area of nature reserves, the latter by 11,200 ha. In addition, to establish more ecological demonstration areas and to complete planning of and investment in the required infrastructure for over 70% of nature reserves;
- developing regulations on the import and export of genetically modified organisms based on risk assessment criteria and relevant technical standards;
- strengthening management of the marine environment, including the prevention and control of marine and land-based sources of pollution, better regulation of coastal and offshore construction projects and improved monitoring of coastal and marine pollution.

### 3.3.4 *Task 4: To Strengthen Protection of the Rural Environment*

43. In this category the major actions to be undertaken include:

- identifying potable water sources in rural areas that are to be protected and to ensure that 80% of such water meets the relevant national standard for this use;
- setting pollution control standards in the use of wastewater irrigation, chemical fertilisers and pesticides. Environmental safety assessments of the latter products is to be strengthened, the use of less toxic and more efficient (i.e. leave less residues) chemical pesticides encouraged and bio-pesticides developed;

- setting pollution discharge standards and management systems for poultry, animal husbandry and fish culture operations, conducting demonstrations at the regional level of comprehensive pollution prevention and control measures related to chemical fertiliser and pesticide application and from poultry and animal husbandry activities;
- using the restructuring of the agriculture sector as a springboard to promote the development of organic farming and water-efficient farming methods;
- forbidding the burning of straw close to high density urban areas, airports, motorways, important railway lines and high-tension power lines. In addition, the development in rural areas of alternative fuels from biomass will be encouraged;
- reducing industrial pollution by encouraging township and village enterprises to locate in township industrial parks rather than in rural areas and promoting the construction of wastewater treatment and solid waste management facilities in villages and towns;

### 3.3.5 *Task 5: To Play an Active Role in Global Environmental Protection*

44. Key actions will include:

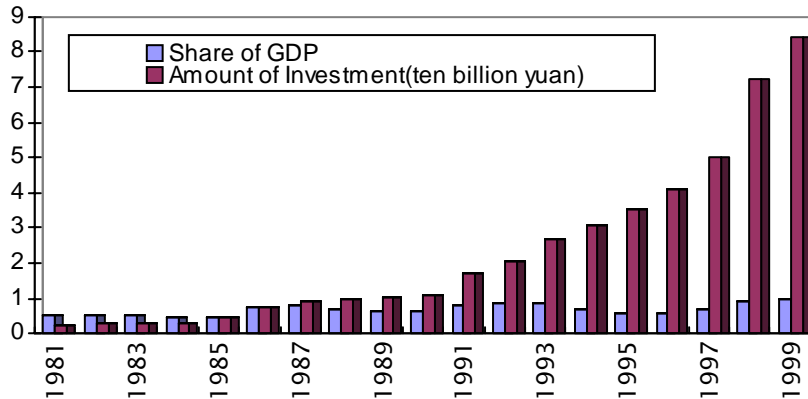
- implementing the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal in order to reduce the illegal import, transshipment and export of such waste;
- ratifying the Copenhagen (1992), Montreal (1997) and Beijing (1999) amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer;
- implementing the Convention on Biological Diversity;
- conducting research on, and implementing initiatives to reduce, greenhouse gas emissions. These include wider promotion of energy conservation and energy efficiency measures, progressively modifying China's energy structure and reducing emissions generated in animal husbandry;
- continuing to mobilise the population to plant more trees for purposes of afforestation and enlarging the forest resource;
- co-ordinating environmental and trade policies to reduce the risk from trade in genetically modified organisms.

## 4.0 **Environmental Investments during the 10<sup>th</sup> Five-year Plan Period**

### 4.1 *Current Status of Environmental Investment*

45. In China the concept of environmental investment usually does not include investment in nature conservation. It does include investment in areas such as industrial and regional pollution control and treatment, environmental infrastructure (for example, urban wastewater treatment plants) and capacity building in environmental institutions. Calculated in current price terms, total environmental investment in China in 1981 amounted to 2.5 billion yuan and this had increased to 84 billion yuan in 1999. During this period, the proportion of annual environmental investment to GDP ranged from 0.52% to 1% (see Figure 4). In the 7<sup>th</sup> and 8<sup>th</sup> five-year plan period total investment in pollution control amounted to 47.642 billion yuan and 130.657 billion yuan respectively (or 0.69% and 0.73% of GDP in each period). The 9<sup>th</sup> National Environmental Five-year Plan envisaged that total investment in pollution control and treatment would be 450 billion yuan between 1996-2000, accounting for 1.3% of GDP. However, in the first four years of the plan the amount was 199.2 billion yuan less than that anticipated. In 1999, the proportion of environmental investment to GDP was nearly 1%. This was a first.

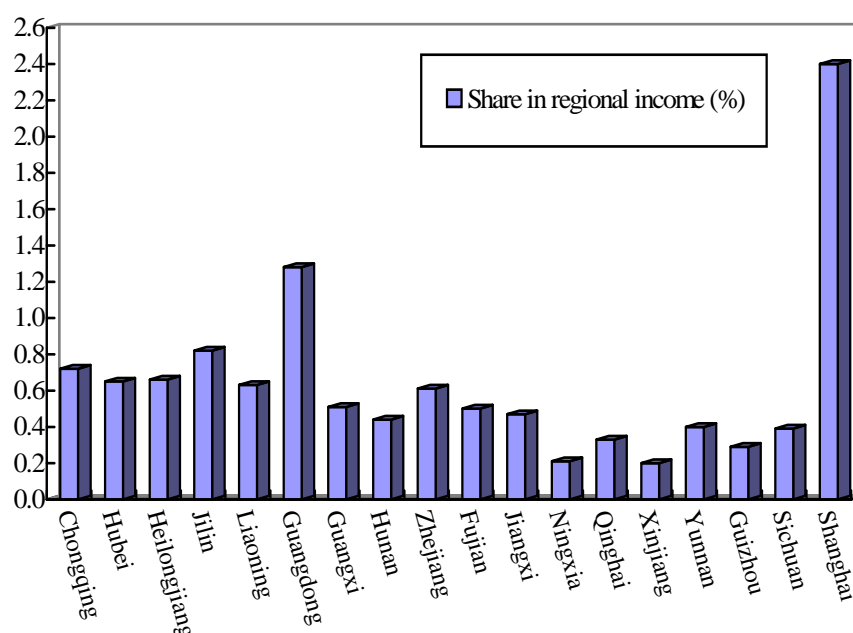
**Figure 4: Environmental Investment in China, 1981-1999**



Source: Calculated from data in China Environmental Yearbook, 1981-1999.

46. There is great variation among the different regions in terms of environmental investment. In 1996 China's State Environmental Protection Administration surveyed environmental investment in 17 provinces and municipalities. It was found that the share of environmental investment in each area as a proportion of regional income differed greatly (see Figure 5). For example, total environmental investment in Shanghai Municipality in 1996 amounted to 6.88 billion yuan, accounting for 2.4% of regional income that year. By contrast, environmental investment in Guangdong Province in the same year amounted to 7.83 billion yuan, or 1.28% of regional income. The proportion of environmental investment to regional income in both Xinjiang and Ningxia was the lowest in 1996, being only 0.2%. In 1999 environmental investment in Beijing Municipality accounted for 4.5% of income, which ranked it first in China.

**Figure 5: Comparison of Environmental Investment Among Different Regions, 1996**



Source: State Environmental Protection Administration, 1997.

#### **4.2 Demand for Environmental Investment during the 10<sup>th</sup> Five-year Plan Period**

47. According to projections developed by the national environmental economics model and reports submitted by environmental protection bureaus of 31 provinces/municipalities, to achieve the environmental targets of the 10<sup>th</sup> five-year plan period will require environmental investments of 700 billion yuan, accounting for about 1.3% of GDP. Table 9 shows the breakdown of the demand for environmental investment.

##### **4.2.1 Investment in Water Pollution Control**

48. It is expected that during the 10<sup>th</sup> five-year plan period, China will reduce COD discharge by 3 million tons using engineering measures. If the cost of reducing 10,000 tons of COD is assume to be 500 million yuan, the total amount of investment required will be 250 billion yuan. Specific actions would be:

- to increase the capacity of centralised treatment of urban wastewater to 40 million tons per day. COD discharge would be reduced by 2.5 million tons annually. If the cost of capital construction (including construction of the sewage collection network) is assumed to be 2500 yuan/ton/day then the total investment in building the wastewater treatment plants would be 100 billion yuan;
- to reduce COD discharge from existing industrial sources by 500,000 tons. This would require investment of about 50 billion yuan.



**Table 9: Demand for Environmental Investment Demand in China during the 10<sup>th</sup> Five-year Plan Period (2001-2005)**

	<b>Water Pollution Control</b>	<b>Air Pollution Control</b>	<b>Solid Waste Treatment and Disposal</b>	<b>Nature Conservation</b>	<b>Capacity Building</b>
Goals	Increased capacity of 3 million tons of COD reduction per year; increased capacity of 40 million tons of urban wastewater treatment per day.	Increased capacity of 2.5 million tons of SO <sub>2</sub> reduction per year; major municipalities to meet standards corresponding to activity.	Increased capacity of 5 million tons of urban refuse disposal per year; increased capacity of 2.3 million tons of hazardous waste disposal per year.	Strengthened efforts in nature conservation	Devpt. of national monitoring and information network, increased capacity for law enforcement
Investment demand (billion yuan)	250	300	90	50	10
Breakdown of the investment	100 billion yuan for building urban wastewater treatment plants; 150 billion yuan for controlling industrial point source pollution.	100 billion yuan for desulphurisation plants; 200 billion yuan for air quality improvement to meet national standards in major municipalities	45 billion yuan for building new urban refuse treatment plants; 20 billion yuan for building centralised hazardous waste treatment and disposal plants; 25 billion yuan for treatment and re-use of industrial solid waste.	50 billion yuan for nature conservation	10 billion for capacity building projects.

49. In addition, new industrial projects subject to the “three simultaneous steps” regulation are required to install water pollution control facilities. This would require about 100 billion yuan of investment during the 10<sup>th</sup> five-year plan period.



50. In total, the demand for investment in water pollution treatment is expected to be 250 billion yuan.

#### 4.2.2 *Investment in Air Pollution Control*

51. During the 10<sup>th</sup> five-year plan period SO<sub>2</sub> emissions are anticipated to be reduced by 2.5 million tons, which will require 100 billion yuan of investment in desulphurisation plants. The breakdown of this sum is:

- 55 billion yuan to be invested in desulphurisation plants for thermal power plants, which would reduce 1.8 million tons of SO<sub>2</sub> emission;
- 30 billion yuan to be invested in the control of domestic SO<sub>2</sub> emissions, which would reduce the amount by 350,000 thousand tons; and
- 15 billion yuan to be invested in desulphurisation plants for industrial furnaces, which would reduce SO<sub>2</sub> emissions by 350,000 tons.

52. As noted earlier, 100 major municipalities have been identified for priority environmental actions. Achieving national standards for air quality in these municipalities will require 200 billion yuan of investment.

53. Overall, 300 billion yuan of investment will be needed for air pollution control.

#### 4.2.3 *Investment in Solid Waste Management*

54. Between 2001-2005 the total amount of urban solid waste generated will increase by 25 million tons a year. Seventy-five percent of this waste is to be treated. To do so, China needs to increase its waste management capacity by 55 million tons a year (i.e. by 150,000 tons a day). Investment of the order of 45 billion yuan will be required. To halt illegal and random disposal of hazardous waste, the capacity to treat and safely dispose of such waste will need to increase by 2.3 million tons annually, requiring about 20 billion yuan of investment. In addition, to increase the rate of re-use of industrial solid waste to 51%, 25 billion yuan of investment will be needed.

55. In total, the demand for investment in solid waste treatment and disposal will be 90 billion yuan.

#### 4.2.4 *Investment in Nature Conservation*

56. Saving ecologically fragile areas in central and western China is a high priority. To give effect to this, 10 national reserves with special ecological functions will be created and 120 ecological demonstration sites established. In addition, 20 further nature reserves are to be set up. To achieve these targets, 50 billion yuan of investment will be needed.

#### 4.2.5 *Investment in Capacity Building*

57. Efforts will focus on strengthening environmental monitoring, improving information exchange, better law enforcement and continuing scientific research. Ten billion yuan of investment will be needed.

#### **4.3 *China Transcentury Green Engineering Program: Phase II***

58. During the 10<sup>th</sup> five-year plan period, the government will carry out phase II of the China Transcentury Green Engineering Program. This will involve the establishment of 1200 projects and require investment of about 200 billion yuan. In particular, 11 major projects with high social, economic, and environmental benefits will be undertaken (see Table 10).

#### **4.4 *Financing Sources***

59. The total amount of funding for environmental protection to be sourced from central and local government is about 315 billion yuan, accounting for 45% of total environmental investment during the period 2001-2005. Of this sum, the central government is expected to provide 80 billion yuan and local government the remainder. Investments by enterprises are anticipated to total 385 billion yuan, contributing 55% of total funds for environmental investment.

60. Major sources of environmental investment include:

- revenue collected under the “three simultaneous steps” regulation for new projects. During the 10<sup>th</sup> five-year plan period it is estimated that China will invest 23000 billion yuan in fixed assets. Total environmental investment under the “three simultaneous steps” regulation will amount to 250 billion yuan (or 33% of total environmental investment demand and 2.5% of total investment in state-owned fixed assets);
- funds from the levy on renovations/redevelopment of existing enterprises. This is expected to amount to 110 billion yuan, or 17% of total environmental investment. This money will be used for improving the control of industrial point source pollution such as the installation of desulphurisation facilities in thermal power plants;
- money collected from the levy on urban environmental infrastructure construction. This is expected to total 280 billion yuan, accounting for 40% of total environmental investment during the 10<sup>th</sup> five-year plan period. Of this sum, 100 billion yuan will be allocated for the construction of new urban wastewater treatment plants, 115 billion yuan will be used for urban air pollution control projects and 65 billion yuan will be used to build urban waste management plants and facilities for the centralised treatment of hazardous waste.

#### **4.5 *Consolidating the Use of Economic Instruments in Environmental Management***

61. During the 10<sup>th</sup> five-year plan period, China needs to consolidate its use of economic instruments to achieve its environmental goals cost-effectively. We note several areas where progress needs to be made.

**Table 10: Eleven Major Environmental Projects to be Undertaken during the Tenth Five-year Plan Period**

Projects	Size of Investment (billion yuan)	Major Components
Water pollution control and treatment in Three Gorges Reservoir Area	7.28	Construction of 37 urban wastewater treatment plants, and 9 urban waste management plants
Water pollution control and treatment in Xiaolangdi Reservoir Area and the middle reaches of the Yellow River	0.546	Construction of 23 urban wastewater treatment plants
Desulphurisation facilities in thermal power plants in the “Two Control Zones” area	16.43	Building of desulphurisation facilities in 51 coal-burning power plants within the “two control zones” area
Building urban wastewater treatment plants in the “Three Rivers” and “Three Lakes” areas	27.1	Building or expanding 145 urban wastewater treatment plants
Project to “Restore Green Water and Blue Skies to Beijing”	12.4	Constructing 8 urban environmental facilities (including 4 urban wastewater treatment plants)
Action plan for the Bohai Sea	9.276	Building 30 urban wastewater treatment plants
Project of “Zero-Discharge” of Hazardous Waste nationwide	20	Building 22 centralised hazardous waste treatment and disposal facilities
National reserves with special ecological functions	0.99	Create 11 major national reserves, including Yangtze River Headwaters Reserve and Yellow River Headwaters Reserve
Capacity building: Environmental monitoring network	1.5	Complete and improve national environmental monitoring network, environmental quality early warning system and satellite-based data transmittal network
National environmental technology innovation	0.42	Establish national environmental technology innovation base and technical support system
Develop a small satellite system for monitoring natural hazards (e.g. floods) and environmental protection	0.62	Launch small satellites for monitoring natural hazards and environmental protection. Set up a matching information processing system

- funds appropriated from the central budget. The government will provide 25 billion yuan for nature conservation and 10 billion for environmental capacity building. In addition, China will seek to borrow US\$4 billion from foreign governments and international financial institutions.

### *3.5.1 Policies to Actively Support Environmental Investment*

62. With the establishment and refinement of its public finance system, China should list environmental investment as a regular item in the budget table of national and sub-national governments. The allocation should ideally increase each year. Money for financing environmental investments should be raised through instruments such as earmarked funds, the issuing of bonds, imposing resource and environmental taxes and reforming the method of expenditure from the pollution levy. An investment fund targeting development of the local environmental goods and services industry and an environmental credit system could also be considered. Banks should be encouraged to provide loans for pollution control and nature conservation projects, subject to applicant meeting the lending criteria.

63. A national environmental fund should be established. This would support environmental research, the promotion of technical innovation in enterprises, integrated water resource management in river basins, environmental projects in western China, the implementation of commitments under multilateral environmental agreements and environmental capacity building.

### *3.5.2 Improved Resource Pricing and Greater Use of Environmental Taxes*

64. Specifically, this includes:

- “getting the price right” for products and services that pollute or damage the environment to internalise the cost of externalities;
- raising the price of water, heating and gas;
- imposing charges on urban wastewater treatment, urban waste management and hazardous waste disposal to enable the construction and operation of new urban environmental infrastructure;
- within the framework of reform of the power sector, include the cost of desulphurisation facilities in power plants as part of the price of power. In addition, mobilise enterprises’ interest in air pollution control and urge coal-burning power plants to install desulphurisation equipment and maintain it;
- phasing out gradually irrational subsidies for pesticides, irrigation water and energy;
- establishing favourable investment and taxation policies and import/export regulations for environmental technologies to attract domestic and foreign investors;

### *3.5.3 Encouraging Further Inflow of Foreign Funds*

65. This includes:

- taking out long-term, low interest loans from international financial institutions and foreign governments to help finance environmental investments; and
- establishing favourable policies to encourage foreign investors to develop environmental infrastructure and the local environmental good and services industry.

66. Finally, when making environmental investments or using long-term loans or grants from abroad the Chinese government should give priority to promoting development in western China.

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