


2008

**Report on the State of the  
Environment in China**

Ministry of Environmental Protection of the People's Republic of China





**The “2008 Report on the State of the Environment of China” is hereby released in accordance with the Environmental Protection Law of the People’s Republic of China.**

Ministry of Environmental Protection



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CPC General Secretary HU Jintao pointed out at the third plenary session of the 17th National Congress of CPC on October 9, 2008 that by 2020, there will be evident improvement of rural living environment and eco environment with continuous enhancement of the capacity in sustainable development.

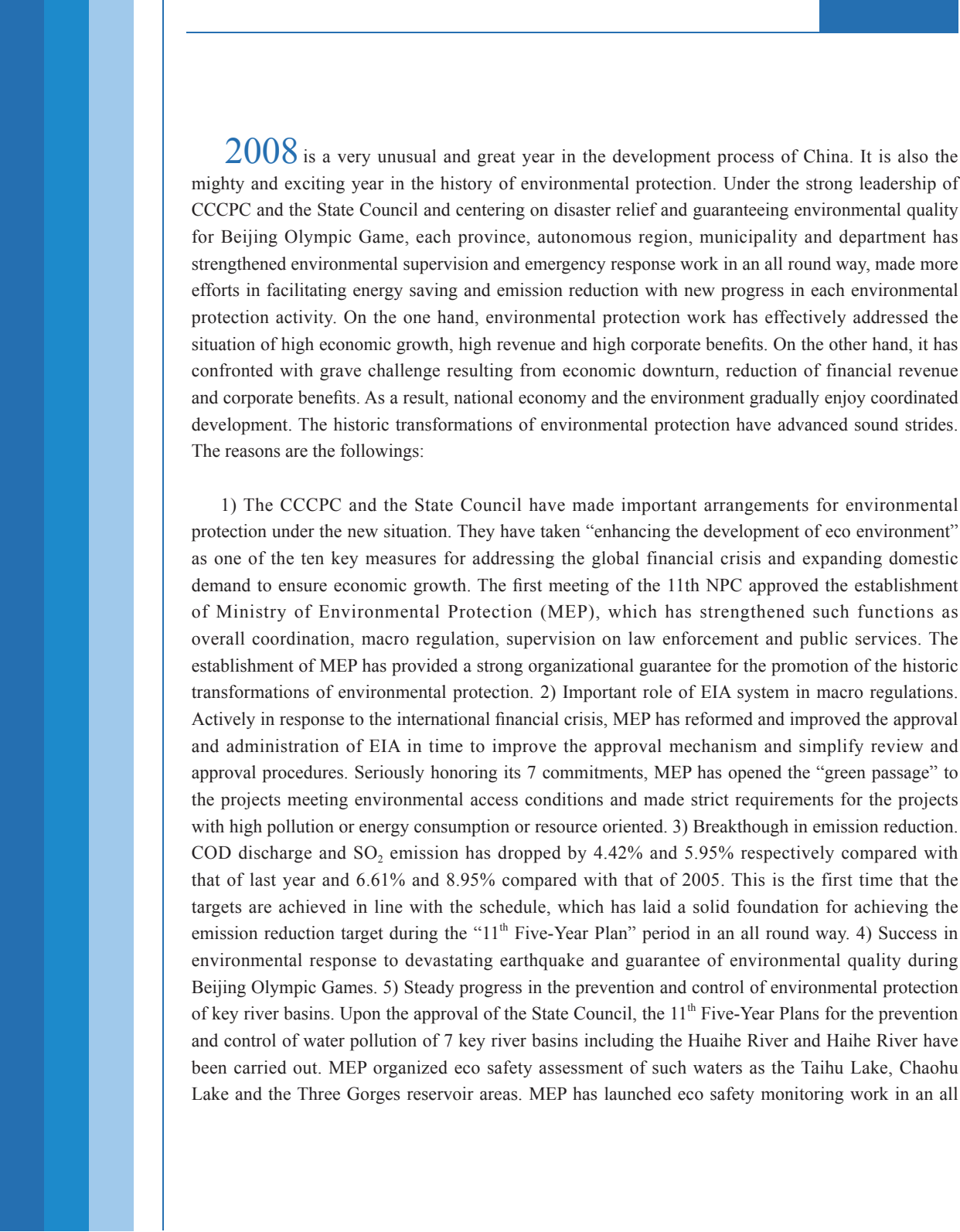
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At the First Meeting of the 11th NPC held on March 5, 2008, Premier Wen Jiabao said the Chinese Government will pay higher attention to resource conservation and environmental protection.

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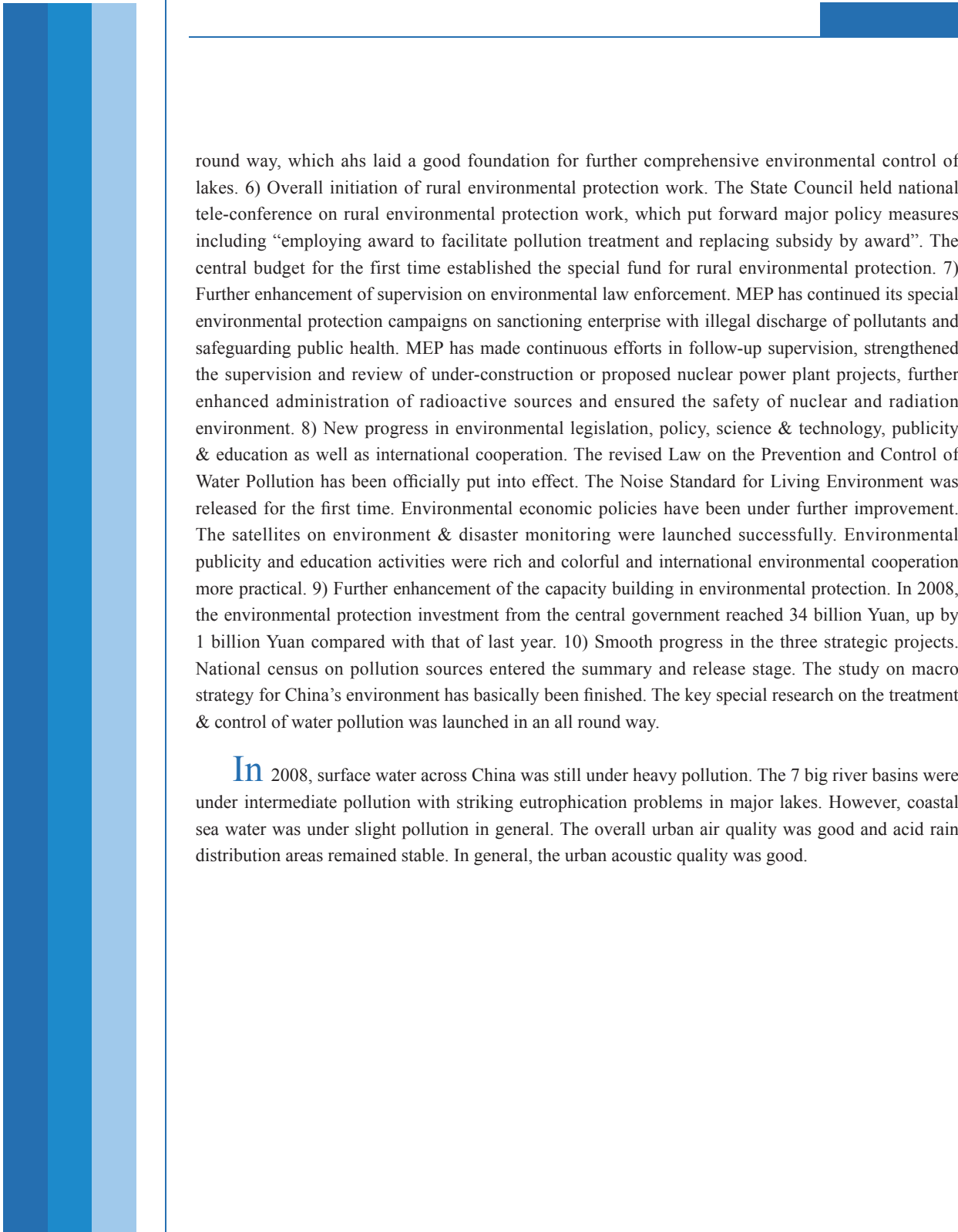
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**2008** is a very unusual and great year in the development process of China. It is also the mighty and exciting year in the history of environmental protection. Under the strong leadership of CCCPC and the State Council and centering on disaster relief and guaranteeing environmental quality for Beijing Olympic Game, each province, autonomous region, municipality and department has strengthened environmental supervision and emergency response work in an all round way, made more efforts in facilitating energy saving and emission reduction with new progress in each environmental protection activity. On the one hand, environmental protection work has effectively addressed the situation of high economic growth, high revenue and high corporate benefits. On the other hand, it has confronted with grave challenge resulting from economic downturn, reduction of financial revenue and corporate benefits. As a result, national economy and the environment gradually enjoy coordinated development. The historic transformations of environmental protection have advanced sound strides. The reasons are the followings:

1) The CCCPC and the State Council have made important arrangements for environmental protection under the new situation. They have taken “enhancing the development of eco environment” as one of the ten key measures for addressing the global financial crisis and expanding domestic demand to ensure economic growth. The first meeting of the 11th NPC approved the establishment of Ministry of Environmental Protection (MEP), which has strengthened such functions as overall coordination, macro regulation, supervision on law enforcement and public services. The establishment of MEP has provided a strong organizational guarantee for the promotion of the historic transformations of environmental protection. 2) Important role of EIA system in macro regulations. Actively in response to the international financial crisis, MEP has reformed and improved the approval and administration of EIA in time to improve the approval mechanism and simplify review and approval procedures. Seriously honoring its 7 commitments, MEP has opened the “green passage” to the projects meeting environmental access conditions and made strict requirements for the projects with high pollution or energy consumption or resource oriented. 3) Breakthrough in emission reduction. COD discharge and SO<sub>2</sub> emission has dropped by 4.42% and 5.95% respectively compared with that of last year and 6.61% and 8.95% compared with that of 2005. This is the first time that the targets are achieved in line with the schedule, which has laid a solid foundation for achieving the emission reduction target during the “11<sup>th</sup> Five-Year Plan” period in an all round way. 4) Success in environmental response to devastating earthquake and guarantee of environmental quality during Beijing Olympic Games. 5) Steady progress in the prevention and control of environmental protection of key river basins. Upon the approval of the State Council, the 11<sup>th</sup> Five-Year Plans for the prevention and control of water pollution of 7 key river basins including the Huaihe River and Haihe River have been carried out. MEP organized eco safety assessment of such waters as the Taihu Lake, Chaohu Lake and the Three Gorges reservoir areas. MEP has launched eco safety monitoring work in an all

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round way, which has laid a good foundation for further comprehensive environmental control of lakes. 6) Overall initiation of rural environmental protection work. The State Council held national tele-conference on rural environmental protection work, which put forward major policy measures including “employing award to facilitate pollution treatment and replacing subsidy by award”. The central budget for the first time established the special fund for rural environmental protection. 7) Further enhancement of supervision on environmental law enforcement. MEP has continued its special environmental protection campaigns on sanctioning enterprise with illegal discharge of pollutants and safeguarding public health. MEP has made continuous efforts in follow-up supervision, strengthened the supervision and review of under-construction or proposed nuclear power plant projects, further enhanced administration of radioactive sources and ensured the safety of nuclear and radiation environment. 8) New progress in environmental legislation, policy, science & technology, publicity & education as well as international cooperation. The revised Law on the Prevention and Control of Water Pollution has been officially put into effect. The Noise Standard for Living Environment was released for the first time. Environmental economic policies have been under further improvement. The satellites on environment & disaster monitoring were launched successfully. Environmental publicity and education activities were rich and colorful and international environmental cooperation more practical. 9) Further enhancement of the capacity building in environmental protection. In 2008, the environmental protection investment from the central government reached 34 billion Yuan, up by 1 billion Yuan compared with that of last year. 10) Smooth progress in the three strategic projects. National census on pollution sources entered the summary and release stage. The study on macro strategy for China’s environment has basically been finished. The key special research on the treatment & control of water pollution was launched in an all round way.

**In** 2008, surface water across China was still under heavy pollution. The 7 big river basins were under intermediate pollution with striking eutrophication problems in major lakes. However, coastal sea water was under slight pollution in general. The overall urban air quality was good and acid rain distribution areas remained stable. In general, the urban acoustic quality was good.



# Reduction of the Total Discharge of Major Pollutants

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## Basic Objectives

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The Outline of the 11<sup>th</sup> Five-Year Plan for National Economic and Social Development identifies the binding target of 20% reduction of energy consumption per unit GDP and 10% reduction of total discharge of major pollutants during 2006~2010. It is expected that by 2010, COD discharge and SO<sub>2</sub> emission will go down by 10% during the 11<sup>th</sup> Five-Year Plan period compared with that of 2005, i.e. COD discharge going down from 14.142 million t in 2005 to 12.728 million t; SO<sub>2</sub> emission reducing from 25.494 million t to 22.944 million t.

Major targets of emission reduction in 2008 are the followings: achievement of new urban sewage treatment capacity of 12 million t /day, annual COD reduction of 600,000 t/y; a total of 30 million kW of existing coal-fired generation sets operating desulphurization facilities, achievement of fume desulphurization projects of 10 sinters with the capacity of 1000 m<sup>2</sup>, leading to annual SO<sub>2</sub> emission reduction of 1.5 million t. MEP has made more efforts in phasing out out-dated productivity in such industries as small thermal power, iron & steel, cement, paper making, alcohol, brewery and citric acid, realizing reduction of 600,000 t SO<sub>2</sub> emission and 400,000 t COD.

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## Reduction of Major Pollutants

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In 2008, total COD discharge across China was 13.207 million t, down by 4.42% compared with that of 2007. Total SO<sub>2</sub> emission reached 23.212 million t, down by 5.95% compared with that of 2007. Total COD discharge dropped by 6.61% and SO<sub>2</sub> by 8.95% compared with that of 2005. They kept good trend of both reduction. It was for the first time that the reduction targets were met in line with the schedule.

Urban sewage treatment rate went up from 62% in

2007 to 66%. The total installed capacity of desulphurized generation units reached 363 million kW. And the proportion of desulphurized generation units in total thermal generation sets went up from 48% in 2007 to 60%.

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## Major Measures

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In 2008, the State Council held the second meeting of the leading group on energy saving and emission reduction. The General Office of the State Council printed out and distributed the 2008 Arrangement of Energy Saving and Emission Reduction Work. It made public the 2007 examination result of each province, autonomous region and municipality as well as the five power corporations in terms of reduction of total emission of major pollutants and the bulletin on the emission of major pollutants of each province, autonomous region and municipality in the first 6 months of 2008. MEP ordered those areas or enterprises with pre-eminent environmental problems to suspend EIA of construction projects, make corrections within a given period of time or with fines.

Local governments at all levels further changed their concept and shifted from passive emission reduction to active cut. The adoption of many accountability instruments has strongly facilitated further progress of emission cut work. Provincial authorities like Shandong and Hebei imposed administrative demerit or removal from his office to the competent leader of a city or county who failed to meet the annual emission cut target. Anhui, Fujian and Jiangxi provinces carried out regional banning of new construction projects in those counties or districts with poor work in emission reduction. Provinces and municipality like Guangdong and Beijing have supported phasing out out-dated productivity by financial subsidy. Shanghai, Ningxia and Shanxi encouraged enterprises to cut emissions by award instead of subsidy.

In 2008, the three major emission reduction measures (emission cut by projects, emission cut by industrial





restructuring and emission cut by supervision) enjoyed steady benefits, leading to both reduction of COD and SO<sub>2</sub> at relatively big margin. 1) Emission cut by projects. A total of 11.49 million t/day new capacity in urban sewage treatment was developed across the country with the increase of 97.12 million kW new capacity of coal-fired generation units with desulphurization facilities. In addition, a number of tertiary waste water treatment projects and fume desulphurization facilities in iron & steel sinters have been developed. With these projects, a total reduction of 1.21 million t COD and 1.35 million t SO<sub>2</sub> emission were obtained across China in 2008. 2) Emission cut by industrial restructuring. The authority has phased out or ordered stop of operation of over 1100 paper manufacturers with heavy pollution; shut down a total capacity of 16.69 million kW of small thermal power generation sets; phased out quite a great deal of out-dated productivities including iron & steel, non-ferrous

metals, cement, coking, chemicals, printing & dyeing and alcohol. The phasing out and shutting down of out-dated productivity has lead to the reduction of 340,000 t of COD and 810,000 t of SO<sub>2</sub> emission across China. 3) Emission cut by supervision. In 2008, the central government put more input in the development of three big systems in emission reduction and capacity building in environmental protection. Local capacity in emission reduction statistics, monitoring and supervision on law enforcement enjoyed further enhancement. The on-line pollution source monitoring system of environmental protection authority of each province has been established one after another. The pollution discharge of more and more enterprises met national standard. Moreover, the comprehensive efficiency of desulphurization power generation units of China went up from 73.2% in 2007 to 78.7% now, up by 5.5 percentage points.

### Establishment of Ministry of Environmental Protection

To strengthen environmental policy-making, planning and coordinate efforts on major environmental issues, the first meeting of the 11th National People's Congress decided to establish the Ministry of Environmental Protection (MEP) on March 15, 2008. Major functions of MEP included drafting and implementing environmental protection plans, policies and standards, coordinating efforts to prepare environmental function zoning, monitoring and managing environmental pollution and solving major environmental issues. In the reshuffle of State Council departments, MEP was the only department directly under the State Council that was elevated to a ministry. This fully reflected the Party and the central government's high attention to environmental protection. The establishment of MEP had great significance for the development of environmental cause and also gave a strong boost to historic transformation of environmental protection.

On July 11, 2008, the General Office of the State Council issued Regulations on Functions, Structures and Staffing of Ministry of Environmental Protection. The Regulations strengthened MEP's functions, canceling and empowering administrative approval power, reducing technical and administrative tasks, straightening out division of work among departments and reinforcing such functions as coordination, macro control, supervision and law enforcement as well as public service. The Ministry added two posts, ministerial chief engineer and chief engineer for nuclear safety, and three departments including Department of Total Control of Pollution Discharge, Department of Environmental Monitoring and Department of Education and Communications. The staffing size increased by 50, which further strengthened the administrative capacity.

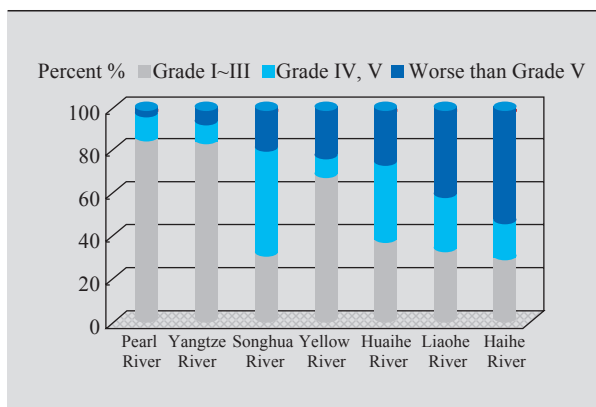
## Water Environment

### Quality of Water Environment

Surface water across China was still under relatively heavy pollution. In general, the seven major river basins were under intermediate pollution. The rivers in Zhejiang Province and Fujian Province were under slight pollution, while rivers in northwest China enjoyed excellent water quality. The water quality of the rivers in southwest China was good. But there was striking eutrophication problem in lakes (reservoirs).

#### Rivers

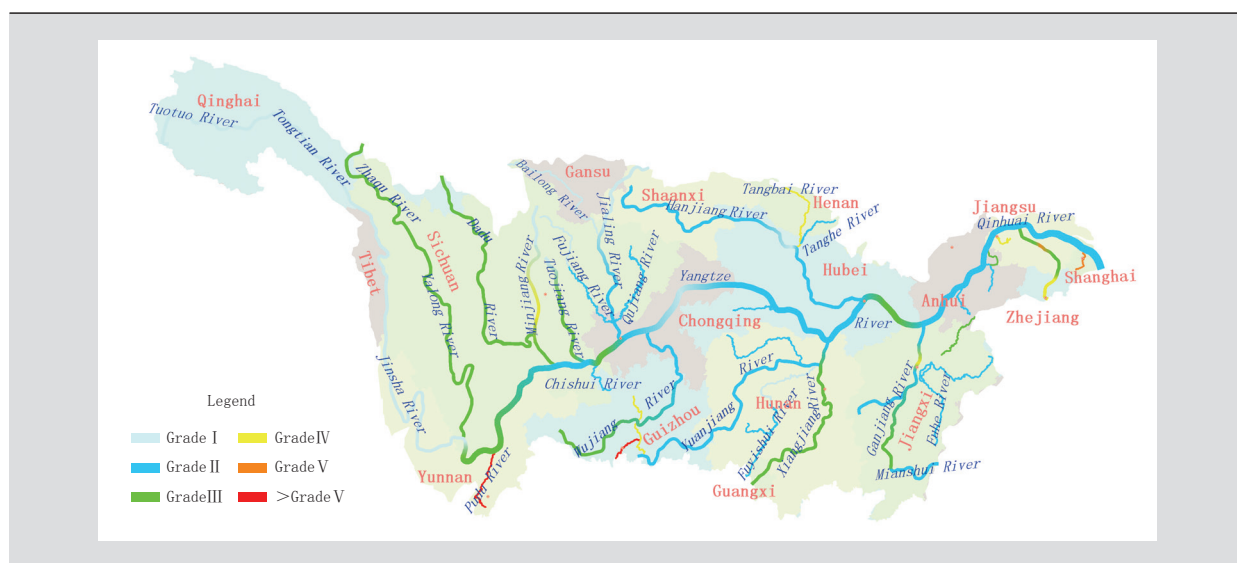
In general, the water quality of seven big rivers (the Yangtze River, Yellow River, Pearl River, Songhua River, Huaihe River, Haihe River and Liaohe River) was similar to that of last year. Among the 409 sections of 200 rivers, 55.0% met Grade I~III national surface water quality standard, 24.2% met Grade IV~V standard and 20.8% failed to meet Grade V standard. Among the big rivers, the overall water quality of the Pearl River and Yangtze River was good. The Songhua River was under slight pollution. The Yellow River, Huaihe River



Water quality grade of 7 big rivers in China

and Liaohe River were under intermediate pollution while the Haihe River under heavy pollution.

**The Yangtze River Waters** The overall water quality of the Yangtze River was good. Among 104 surface water sections under national monitoring program, 85.6% met Grade I~III national water quality standard, 6.7% met Grade IV standard, 1.9% met Grade V standard and 5.8% failed to



Water quality of the Yangtze River waters

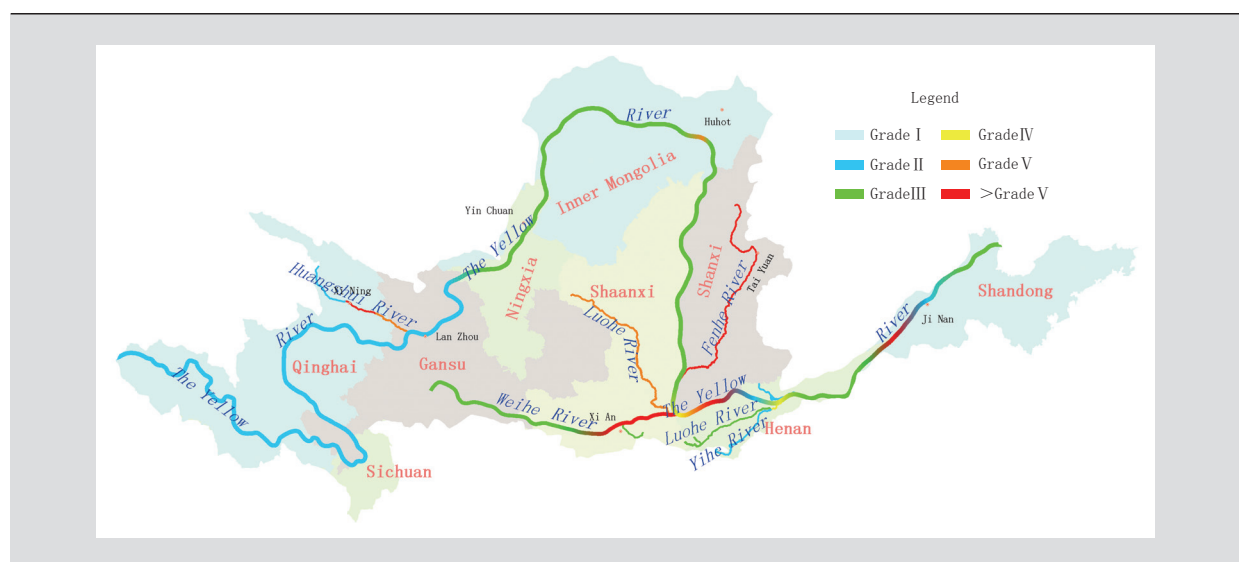
meet Grade V standard. Major pollutants included ammonia nitrogen, petroleum and BOD<sub>5</sub>.

The overall quality of the mainstream of the Yangtze River was excellent with no evident change compared with that of the last year.

The overall quality of the tributaries of the Yangtze River was good without any evident change as compared with that of 2007. In the ten biggest tributaries of the Yangtze River, the Minjiang River, Tuojiang River, Jialing River, Wujiang River, Yuanjiang River and Hanjiang River enjoyed excellent quality. Yalong River, Dadu River, Xiangjiang River and Ganjiang River had good quality. However, Meishan section of the Minjiang River and Nanchang section of Ganjiang River were

under slight pollution. Major pollutants included ammonia nitrogen.

Water quality of trans-province river sections was good. Among 20 sections, 85.0% met Grade I~III national water quality standard, 10.0% met Grade IV standard and 5.0% failed to meet Grade V standard, with no obvious change compared with that of 2007. The section under the most serious pollution was the Chuhe River-Chahe River section at Chuzhou where is the boundary between Anhui Province and Jiangsu Province, which failed to meet Grade V standard. Major pollutants included ammonia nitrogen, permanganate index and BOD<sub>5</sub>.



Water quality of the Yellow River waters

**The Yellow River Waters** In general, the Yellow River waters were under intermediate pollution. Among 44 sections under national monitoring program, 68.2% met Grade II~III quality standard, 4.5% met Grade IV standard, 6.8% met Grade V standard and 20.5% failed to meet Grade V standard. Major pollutants included ammonia nitrogen, petroleum and BOD<sub>5</sub>.

The overall water quality of the mainstream of the Yellow River was excellent with no obvious change compared with that of 2007. But the Sanmenxia section of the Yellow River in Henan Province was under slight pollution. Other sections enjoyed excellent or good water quality.

In general, the tributaries of the Yellow River were under heavy pollution with no obvious change compared with that of 2007. All tributaries except the Yihe River, Bahe River, Luohe River and Qinhe River were subject heavy pollution.

Xi'an section and Weinan section of the Weihe River, Xining section of Huangshui River, Taiyuan section, Linfen section and Yuncheng section of the Fenhe River, Yuncheng section of the Sushui River were under heavy pollution.

In general, the trans-province river sections were under intermediate pollution. Among 11 sections, 54.5% met Grade II~III national water quality standard, 9.1% met Grade IV standard, 9.1% met Grade V standard and 27.3% failed to meet Grade V standard. Major pollutants included ammonia nitrogen, petroleum and BOD<sub>5</sub>. Tongguan Diaojiao section (Shaanxi-Henan, Shaanxi) in Weinan of the Weihe River; Hejindaqiao section in Yuncheng (Shanxi-Shaanxi, Shanxi) of the Fenhe River, Zhangliuzhuang section in Yuncheng (Shanxi-Shaanxi, Shanxi) of the Sushui River were under serious pollution.



## Water quality of the Pearl River waters

**The Pearl River Waters** The overall quality of the Pearl River was good. In 33 sections under national monitoring program, and 84.9% met Grade I~III quality standard, 9.1% met Grade IV standard, 3.0% met Grade V standard and 3.0% failed to meet Grade V standard. Major pollutants included petroleum and BOD<sub>5</sub> and ammonia nitrogen.

The overall water quality of the mainstream of the Pearl River was good with no evident change compared with that of 2007. The Guangzhou section of the Pearl River was under slight pollution.

In general, water quality of all branches of the Pearl River

was excellent without any obvious change compared with that of last year. However, the Shenzhen River was under heavy pollution.

Among all rivers in Hainan Province, the Wanquan River had excellent quality, Haidian creek was under slight pollution. The main pollutant was petroleum. There was no obvious change of water quality compared with that of 2007.

Trans-province river sections had excellent water quality. Among 7 such sections, 4 met Grade II quality standard and 3 met Grade III standard. There was no obvious change of the water quality as compared with that of 2007.



## Water quality of the Songhua River waters



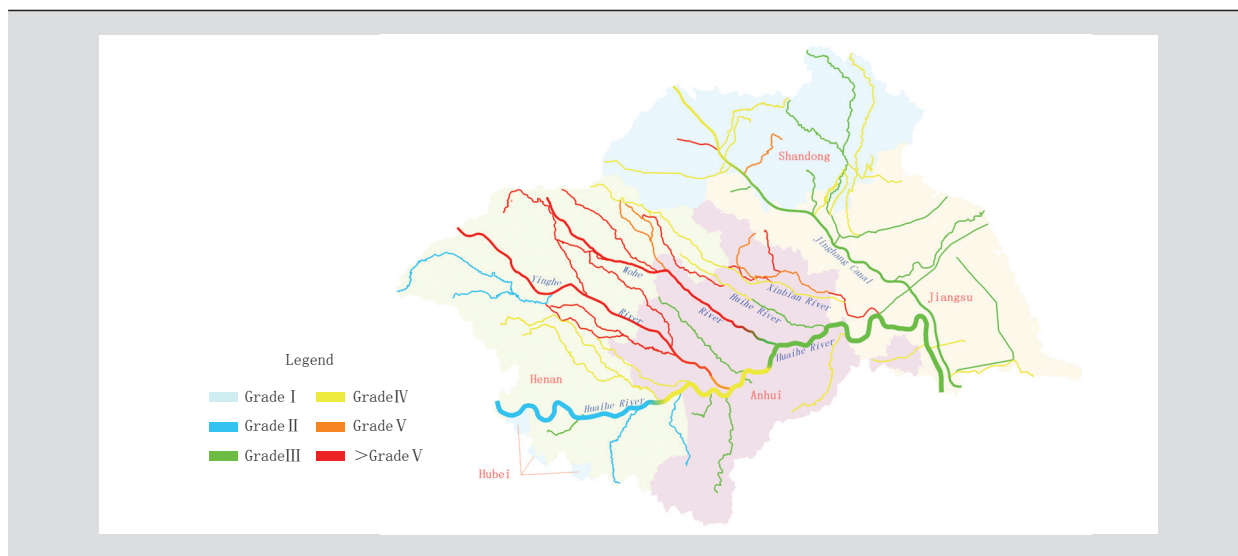
**The Songhua River Waters** In general, the Songhua River waters were under slight pollution. Among 42 sections under national monitoring program, 33.3% met Grade I~III quality standard, 45.2% met Grade IV standard, 7.2% met Grade V standard and 14.3% failed to meet Grade V standard. Major pollutants were permanganate index, petroleum and BOD<sub>5</sub>.

The water quality of the mainstream of the Songhua River

was under slight pollution with no obvious change compared with that of 2007.

In general, all tributaries of the Songhua River were under intermediate water pollution with evident improvement compared with that of last year.

Among the five trans-province river sections, 3 met Grade III standard and 2 met Grade IV standard.



Water quality of the Huaihe River waters

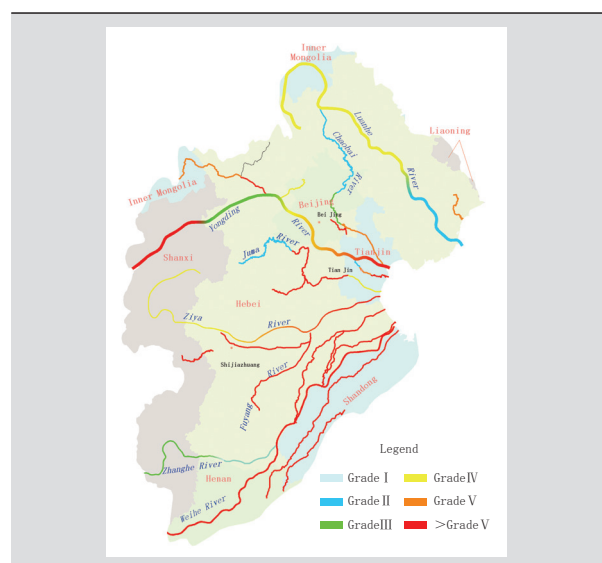
**The Huaihe River Waters** In general, the Huaihe River waters were under intermediate pollution. Among the 86 sections, 38.4% met Grade II~III quality standard, 33.7% met Grade IV standard, 5.8% met Grade V standard and 22.1% failed to meet Grade V standard. Main pollutants were permanganate index, BOD<sub>5</sub> and ammonia nitrogen.

The mainstream of the Huaihe River was under slight pollution with evident improvement of water quality compared with that of 2007.

The tributaries of the Huaihe River was under intermediate pollution with no obvious change of water quality compared with that of 2007. Among the major primary tributaries, the Shiguan River and Huanghe River had excellent water quality; Shihe River and Xifei River had good quality; Honghe River, Tuohe River and Kuaihe River were under slight pollution; Wohe River and Yinghe River were subject to heavy pollution. In General, the Yihe River, Shuhe River and Sihe River were under intermediate pollution.

Trans-province river sections were under intermediate pollution. Among 33 river sections, 21.2%, 42.4% and 6.1% met Grade II~III, IV or V national water quality standard respectively; 30.3% failed to meet Grade V standard. Major

pollutants were BOD<sub>5</sub>, permanganate index and petroleum. The water quality had no obvious change compared with that of last year.



Water quality of the Haihe River waters

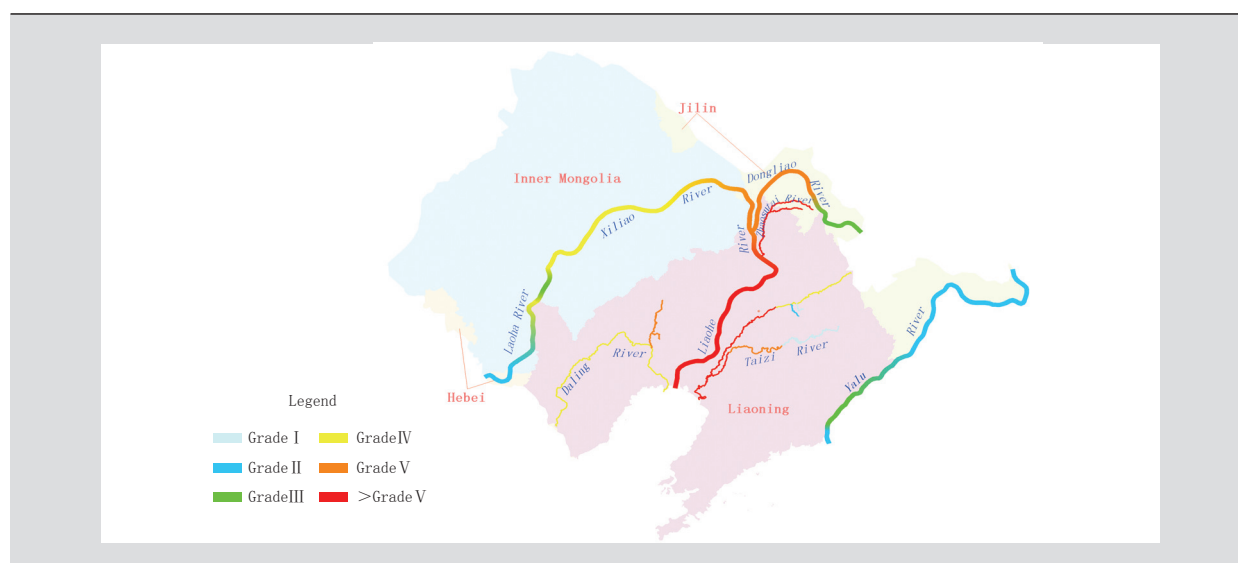
**The Haihe River Waters** In general, the Haihe River waters were under heavy pollution. Among 63 sections, 28.6%, 14.3% and 6.3% met Grade I~III, IV or V water quality standard respectively; 50.8% failed to meet Grade V standard. Major pollutants were ammonia nitrogen, BOD<sub>5</sub> and permanganate index.

In general, the mainstream of Haihe River was under heavy pollution with no obvious change of water quality compared with that of last year.

The overall water quality of other rivers in Haihe River basin was under heavy pollution with no evident change

compared with that of 2007. The Luanhe River enjoyed good quality. The Yongding River was under slight pollution. While the North Canal, Zhangweixin River, Dasha River, Ziya River, Majia River and Tuhai River were under heavy pollution.

Trans-province river sections were under heavy pollution. Among 18 trans-province sections, 38.9%, 5.6% and 11.1% met Grade II~III, IV or V standard respectively. 44.4% failed to meet Grade V standard. Major pollutants were ammonia nitrogen, BOD<sub>5</sub> and permanganate index. The water quality had no obvious change compared with that of last year.

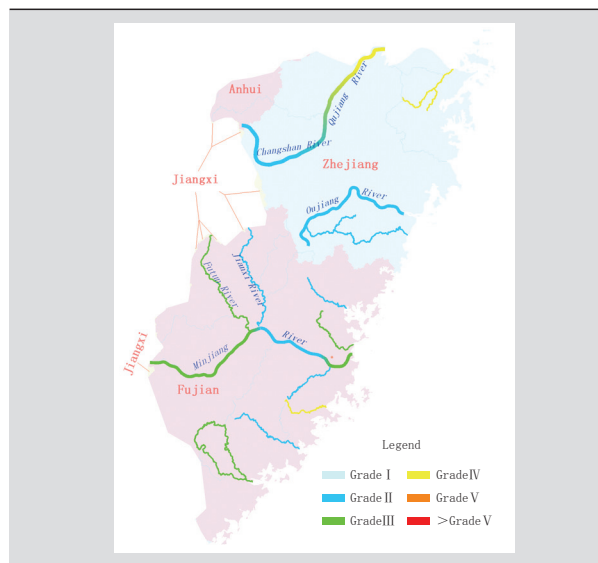


Water quality of the Liaohe River waters

**The Liaohe River Waters** In general, the Liaohe River waters were under intermediate pollution. Among 37 surface water monitoring sections under national monitoring program, 35.1%, 13.5% and 18.9% met Grade II~III, IV or V standard. The rest 32.5% failed to meet Grade V standard. Major pollutants were petroleum, permanganate index and ammonia nitrogen.

The mainstream of Liaohe River was under intermediate pollution. Laoha River and Dongliao River enjoyed good water quality. The Xiliao River was under intermediate pollution. The Liaohe River was under heavy pollution. The water quality had evident decline in the Xiliao River but had no obvious change in the Liaohe River, Laoha River and Dongliao River compared with that of last year.

In general, the tributaries of Liaohe River were under heavy pollution. The Xilamulun River was under slight pollution. The Tiaozi River and Zhaosutai River were under heavy pollution. The water quality had no obvious change compared with that of last year.



Water quality of rivers in Zhejiang and Fujian

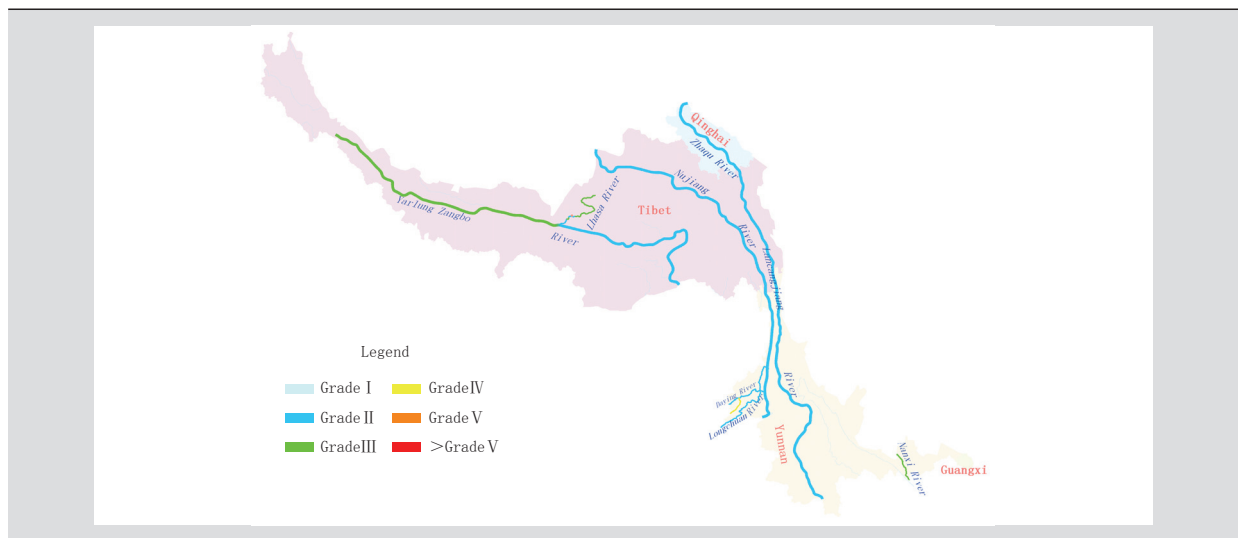


The overall water quality of Daliao River and its tributaries were under heavy pollution with no obvious change compared with that of last year. Daling River was subject to intermediate pollution. Major pollutants were petroleum, ammonia nitrogen and permanganate index.

Among 3 trans-province river sections, one met Grade II standard and 2 met Grade V standard. There was no obvious

change of water quality compared with that of last year.

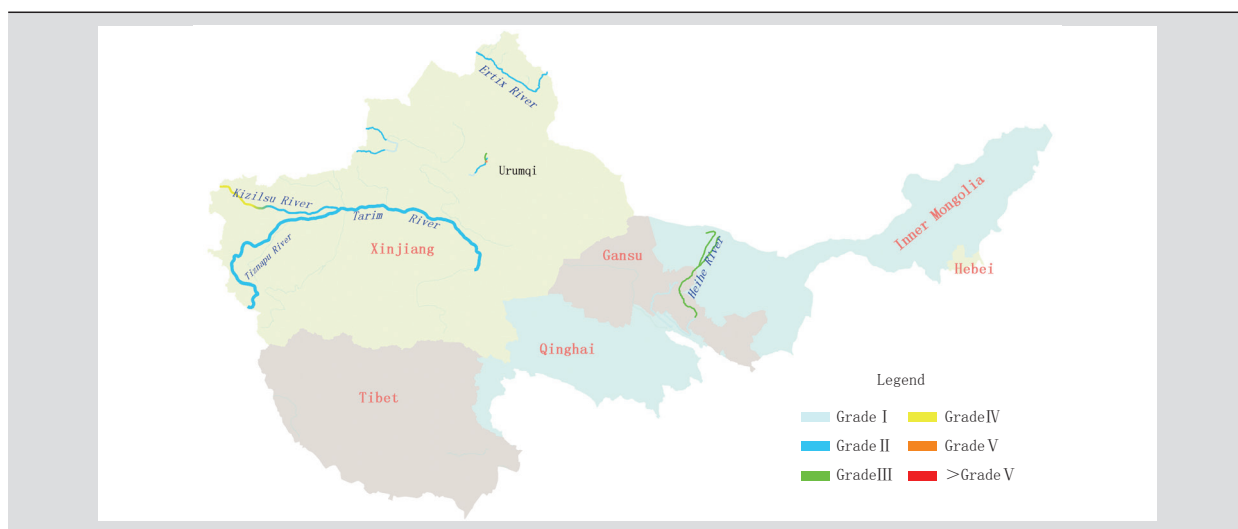
**Rivers in Zhejiang and Fujian Province** In general, rivers in Zhejiang and Fujian were under slight pollution. Among 32 surface water sections under national monitoring program, 71.9% and 28.1% met Grade II~III or IV standard respectively. Main pollutants were petroleum, ammonia nitrogen and BOD<sub>5</sub>.



Water quality of the rivers in Southwest China

**Rivers in Southwest China** The overall water quality was good. Among 17 surface water sections under national monitoring program, 88.2% met Grade II~III standard and 11.8% failed to meet Grade V standard. Major pollutant was lead.

**Rivers in Northwest China** The overall water quality was excellent. Among 28 surface water sections under national monitoring program, 92.8% and 3.6% met Grade I~III or IV water quality standard. 3.6% failed to meet Grade V standard. Major pollutants were petroleum, ammonia nitrogen and BOD<sub>5</sub>.



Water quality of the rivers in Northwest China

## Lakes (Reservoirs)

Among 28 key lakes (reservoir) under national monitoring program, 4 met Grade II quality standard, accounting for 14.3%; 2 met Grade III standard, taking up 7.1%; 6 met Grade IV standard, accounting for 21.4%; 5 met Grade V standard,

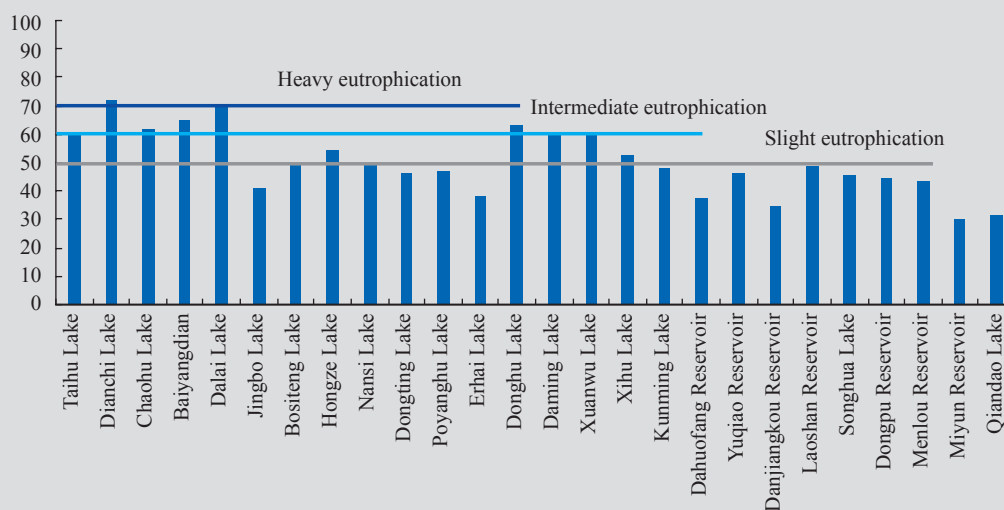
taking up 17.9%; 11 failed to meet Grade V standard, taking up 39.3%. The main pollutants were TN and TP. Among the 26 lakes (reservoir) under eutrophication monitoring, 1 was under heavy eutrophication(HE), taking up 3.8%; 5 were under intermediate eutrophication(IE), taking up 19.2%; 6 were under slight eutrophication(SE), accounting for 23.0%.

Water quality of major lakes (Reservoirs)

Waters \ Grade	Amount	I	II	III	IV	V	>V
Three lakes*	3					1	2
Big fresh-water lake	10		2	1	3	1	3
Urban lake	5				1		4
Big reservoir	10		2	1	2	3	2
Total	28		4	2	6	5	11
Percent (%)		0	14.3	7.1	21.4	17.9	39.3

\* Three lakes refer to Taihu Lake, Dianchi Lake and Chaohu Lake.

Nutrition index



Nutrition index of major lakes and reservoirs





**Taihu Lake** In general, the Taihu Lake failed to meet Grade V standard. Among the 21 monitoring sites under national water quality monitoring program, 14.3% and 23.8% met Grade IV or V standard respectively; 61.9% failed to meet Grade V standard. The water quality had no obvious change compared with that of 2007. The Taihu Lake was under intermediate eutrophication with main pollutants being TN and TP.

In general, the rivers surrounding the Taihu Lake were under intermediate pollution. The water quality enjoyed evident improvement compared with that of last year. The main pollutants were ammonia nitrogen, BOD<sub>5</sub> and petroleum.

**Dianchi Lake** In general, the Dianchi Lake failed to meet Grade V standard. Caohai Lake was subject to heavy eutrophication and Waihai Lake under intermediate eutrophication. The main pollutants were ammonia nitrogen, TP and TN.

All rivers flowing into the Dianchi Lake were under heavy pollution. Among 8 sections under national monitoring program, 37.5% met Grade I~III standard and 62.5% failed to meet Grade V standard. The water quality enjoyed some improvement compared with that of last year. The main pollutants were ammonia nitrogen, BOD<sub>5</sub> and petroleum.

**Chaohu Lake** The Chaohu Lake met Grade V water quality standard without any obvious change compared with that of 2007.

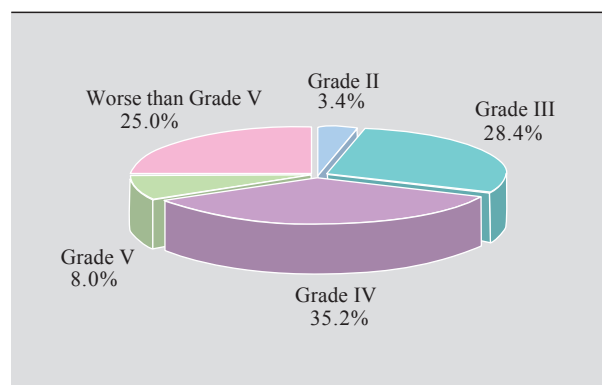
The western part of the lake was under intermediate eutrophication, while the eastern part under slight eutrophication. The main pollutants were TP, TN and petroleum.

In general, all rivers flowing into the Chaohu Lake were under heavy pollution. Among the 12 surface sections under national monitoring program (including two pollution control sections), 16.7% and 33.3% met Grade III or IV standard respectively, 50.0% failed to meet Grade V standard. The main pollutants were petroleum, ammonia nitrogen and permanganate index.

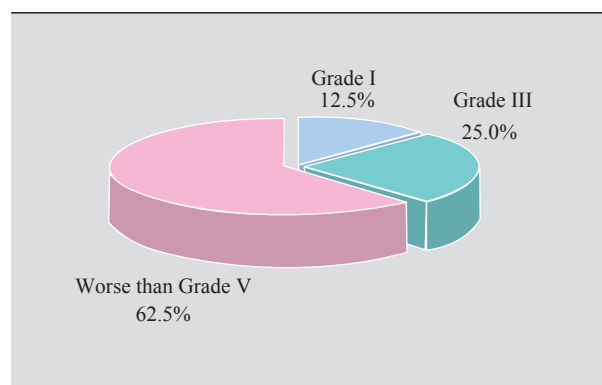
**Other big fresh water lakes** Among the ten big fresh water lakes under national pollution control program, Erhai Lake and Xingkai Lake met Grade II water quality standard; Bositeng Lake Grade III; Nansi Lake, Jingbo Lake and Poyang Lake met Grade IV standard; Dongting Lake met Grade V standard; while Dalai Lake, Hongze Lake and Baiyangdian Lake failed to meet Grade V standard. Compared with that of last year, water quality of Erhai Lake, Xingkai Lake and Nansi Lake turned better, while water quality of Dongting Lake degraded. There was no evident change of water quality of other big fresh water lakes. The main pollutants were TP and TN.

The Erhai Lake, Dongting Lake, Jingbo Lake and Poyang

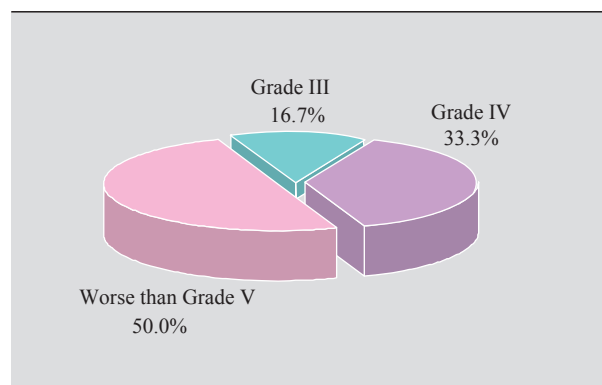
Lake were under mesotrophic conditions. The Bositeng Lake, Hongze Lake and Nansi Lake were under slight eutrophication, while Dalai Lake and Baiyangdian Lake were under intermediate eutrophication.



Water quality of rivers flowing into Taihu Lake



Water quality of rivers flowing into Dianchi Lake



Water quality of rivers flowing into Chaohu Lake

Water quality of key freshwater lakes

Name	Index of nutrition	State of nutrition	Water quality		Major pollutants
			2008	2007	
Dalai Lake	68.7	ME	>V	>V	pH, permanaganate index and TP
Baiyangdian	65.3	ME	>V	>V	Ammonia nitrogen, TP and TN
Hongze Lake	55.8	SE	>V	>V	TN, TP
Nansi Lake	50.8	SE	IV	V	Petroleum, TP and TN
Bositeng Lake	50.7	SE	III	III	-
Poyang Lake	49.4	Mesotrophic	IV	IV	Petroleum, TP and TN
Dongting Lake	46.6	Mesotrophic	V	IV	TP, TN
Jingbo Lake	40.1	Mesotrophic	IV	IV	Permanaganate index
Erhai Lake	38.9	Mesotrophic	II	III	-
Xingkai Lake	-	-	II	IV	-

**Urban Lakes** Kunming Lake (Beijing) met Grade IV standard; Xihu Lake (Hangzhou), Donghu Lake (Wuhan), Xuanwu Lake (Nanning), Daming Lake (Jinan) failed to meet Grade V standard. Compared with that of last year, water quality of Kunming Lake went down. However, there was no obvious change of the water quality of other urban lakes.

Major pollutants were TN and TP.

The Kunming Lake was under mesotrophic conditions (MC), Xuanwu Lake, Xihu Lake and Daming Lake were under slight eutrophication (SE), while Donghu Lake was under intermediate eutrophication (IE).

Water quality of urban lakes

Lake Name	Index of nutrition	State of nutrition	Water quality		Major pollutants
			2008	2007	
Donghu Lake	63.0	IE	>V	>V	TP, TN and permanganate index
Xuanwu Lake	59.6	SE	>V	>V	TN, TP
Daming Lake	59.5	SE	>V	>V	TN, BOD <sub>5</sub> and TP
Xihu Lake	51.8	SE	>V	>V	TN, petroleum
Kunming Lake	49.3	Mesotrophic	IV	III	TP, TN

**Big Reservoirs** Miyun Reservoir (Beijing) and Shimen Reservoir (Shaanxi) met Grade II water quality standard, Dongpu Reservoir (Anhui) met Grade III standard; Danjiangkou Reservoir (Hubei and Henan) and Qiandao Lake (Zhejiang) met Grade IV standard; Dahufang Reservoir (Liaoning), Yuqiao Reservoir (Tianjin) and Songhua Lake (Jilin) met Grade V standard; while Menlou Reservoir

(Shandong) and Laoshan Reservoir (Shandong) failed to meet Grade V standard. Compared with that of last year, the water quality of Qiandao Lake and Danjiangkou Reservoir went down, while there was no obvious change in other 8 big reservoirs. The main pollutant was total nitrogen (TN).

All the nine big reservoirs were under mesotrophic conditions.



Water quality of big reservoirs

Name	Index of nutrition	State of nutrition	Water quality		Main pollutant
			2008	2007	
Laoshan Reservoir	49.8	Mesotrophic	>V	>V	TN
Yuqiao Reservoir	46.8	Mesotrophic	V	V	TN
Songhua Lake	45.3	Mesotrophic	V	V	TN, TP
Dongpu Reservoir	44.2	Mesotrophic	III	III	-
Menlou Reservoir	40.5	Mesotrophic	> V	> V	TN
Dahuofang reservoir	36.7	Mesotrophic	V	V	TN
Qiandao Lake	34.1	Mesotrophic	IV	III	TN
Miyun Reservoir	32.7	Mesotrophic	II	II	-
Danjiangkou Reservoir	31.9	Mesotrophic	IV	III	TN
Shimen Reservoir	-	-	II	II	-

## Key Water Projects

**The Three Gorges Reservoir** The water quality of the Three Gorges Reservoir was excellent. Among the 6 sections under national monitoring program, Shaiwangba section of the Yangtze River met Grade I water quality standard, other sections met Grade II standard.

**Waters along the South-North Water Diversion Project** In general, the waters along the South-North water diversion project were under slight pollution. Among the 10 monitoring sections, 50.0% and 40.0% met Grade II~III or IV~V standard respectively, while 10.0% failed to meet Grade V standard. The water quality had some improvement compared with that of last year. Main pollutants were permanganate index, BOD<sub>5</sub> and ammonia nitrogen.

## Environmental quality of inland fishery waters

Important fishery waters of rivers were mainly subject to TP, ammonia nitrogen, permanganate and copper pollution. Some fishery waters of the Yellow River basin, Yangtze River basin and Heilongjiang River basin were subject to relatively

heavy TP pollution. Some fishery waters of the Yellow River basin and Pearl River basin were under relatively heavy ammonia nitrogen pollution. Certain fishery waters of the Heilongjiang River basin and Yellow River basin were under relatively heavy permanganate pollution. Some fishery waters of the Yellow River basin and Yangtze River basin were under relatively heavy copper pollution. Compared with that of last year, the pollution range of ammonia nitrogen and volatile phenol had slight increase; while the pollution scope of TP, permanganate index, petroleum, Copper, zinc, lead and cadmium had decline at different degree.

Important fishery waters of lakes and reservoirs were mainly subject to TN, TP and permanganate pollution.

## Discharge of waste water and major pollutants

In 2008, the total discharge of waste water across China was 57.2 billion t, up by 2.7% compared with that of 2007. Total COD discharge was 13.207 million t, down by 4.4% compared with that of 2007. The total discharge of ammonia nitrogen was 1.27 million t, down by 4.0% compared with that of last year.

Total discharge of waste water and major pollutants during 2006–2008

Item Year	Waste water discharge (billion t)			COD discharge (10,000 t)			Ammonia nitrogen discharge (10,000 t)		
	Total	Industrial	Domestic	Total	Industrial	Domestic	Total	Industrial	Domestic
2006	53.68	24.02	29.66	1428.2	541.5	886.7	141.3	42.5	98.8
2007	55.68	24.66	31.02	1381.8	511.1	870.8	132.3	34.1	98.3
2008	57.20	24.19	33.01	1320.7	457.6	863.1	127.0	29.7	97.3

## Measures and Actions

**【 Prevention and control of water pollution of key river basins 】** The State Environmental Protection Administration (now Ministry of Environmental Protection) and NDRC jointly printed & distributed the Plan for the Prevention and Control of Water Pollution of the Three Gorges Reservoir and Its Upper Reaches (Revision) in January of 2008. MEP, NDRC, Ministry of Water Resources and Ministry of Housing and Urban-Rural Construction jointly printed & distributed the Plan for the Prevention and Control of Water Pollution of Key River Basins Including the Huaihe River, Haihe River, Liaohe River, Chaohu Lake, Dianchi Lake and Mid & Upper Reaches of the Yellow River (2006—2010) in April of the same year. MEP cooperated with NDRC to develop the Master Plan for Comprehensive Control of Water Environment of the Taihu Lake Basin, which began the implementation after the approval by the State Council in May of 2008.

MEP held the Inter-Ministry Meeting on Environmental Protection (special meeting on the prevention and control of water pollution of the Songhua River) in Harbin in April of 2008. In September, MEP held a meeting on the prevention and control of water pollution in key river basins in Jinan of Shandong Province. According to the policy of “rehabilitating rivers, lakes and seas”, MEP has summarized and arranged the work on the prevention and control of water pollution of key river basins.

According to the instruction by Premier Wen Jiabao, MEP in cooperation with local governments, NDRC and Ministry of Water Resources set up a leading group and carried out the implementation of the Program on Comprehensive Assessment & Control of Ecological Security of Key Lakes and Reservoirs of China. It has organized the development of the technical plan of the Program on Comprehensive Assessment & Control of Ecological Security of Key Lakes

and Reservoirs of China, set up the assessment system for lake ecology security, submitted the report on the investigation & assessment of eco security of 9 big lakes & reservoirs, which has passed the check and acceptance.

**【 Strengthen the protection of drinking water source areas 】** MEP carried out the investigation & assessment of the environmental situation of the drinking water sources of the cities at or above city level and presented the first draft of Report on the Investigation & Assessment of the Basic Environment of Drinking Water Source Areas across China (Urban Part). It has revised the National Plan for Environmental Protection of Urban Drinking Water Sources. MEP in cooperation with relevant departments of the State Council carried out follow-up monitoring on the implementation of environmental control measures in drinking water source protected areas. A total of 350,000 person-times of environmental law enforcement workers had been mobilized across China, who checked 4661 protected areas for drinking water source and banned or shut down 845 pollutant outlets and illegal construction projects within such protected areas. MEP had printed out and distributed the Technical Specifications for the Mark of Protected Areas of Drinking Water Source (HJ/T 433—2008), which guides local authorities to standardize the management on the zoning, adjustment and protection of protected areas for drinking water sources. It printed out and distributed the Circular on Key Work of Rural Environmental Protection in 2009 and Next Few Years and the Work Division. In addition, MEP has made a comprehensive arrangement for such work as ensuring the safety of drinking water in rural areas and prevention and control of non-point pollution.

**【 Meeting on communications of the experience in protecting the Erhai Lake 】** MEP held the meeting on communications of the experience in protecting the Erhai Lake in Dali of Yunnan Province during December 1-2 of 2008. The meeting summarized and extended the successful experience and practice of Dali in protecting the Erhai Lake during rapid economic development and actively explored



the new thinking to ecologically rehabilitate rivers, lakes and seas. Minister Zhou Shengxian said, to do well the assessment of lake eco security, we must speed up our work on the prevention and control of water pollution of lakes & reservoirs and guard against water pollution accident. Taking the arsenic pollution in Yangzonghai Lake as a lesson, we should carry out an overall inspection on key lakes & reservoirs in particulate the collective drinking water source protected areas. We must firmly control the pollution source threatening the security of lakes & reservoirs and eliminate any hidden risk. We should accelerate the implementation of the plan for the prevention and control of water pollution of the key lakes, reservoirs and watershed such as the “Three lakes”, Three Gorges Reservoir and Danjiangkou Reservoir. Taking the good opportunity of new investment from the central budget, we should put more investment and accelerate the construction of pollution treatment projects on condition of ensuring project quality.

**[ Revision and implementation of the Law on Prevention and Control of Water Pollution ]** The 32<sup>nd</sup>

meeting of the Standing Committee of the 10<sup>th</sup> National People's Congress reviewed and passed the second revision of the Law of the People's Republic of China on Prevention and Control of Water Pollution on Feb. 26—28, 2008, which was put into effect on June 1, 2008.

The Law of the People's Republic of China on Prevention and Control of Water Pollution (2008 Version) identifies the following three principles: 1) Prevention first; 2) Combining prevention with control; 3) Comprehensive treatment. The new law highlights the following 10 points: First, taking the guarantee of drinking water safety as the first priority; second, further enhancing the environmental responsibility of local governments; third, more clearly identifying the boundary of environmental infringements; fourth, further strengthening & expanding the total emission control system; fifth, identifying the legal position of pollution discharge permit system; sixth, legal guaranteeing the right of public participation; seventh, adding the obligation of self-monitoring by pollution discharging units; eighth, enhancing the prevention and control of urban sewage and water pollution in agriculture and

### The Three Major Strategic Programs Progressing Smoothly

The three major strategic programs, general investigation of pollution sources, macro strategic study on China's environment and special program for water pollution control, were progressing smoothly. Their guiding role for current and long-term development was being displayed.

The 2008 general investigation on pollution sources entered the stage of door-to-door survey. Local governments and the environmental protection departments joined hands to get prepared for personnel training, door-to-door survey, supervising examination, technical review and check off. They delivered the standardized investigation forms down to the county-level investigation agencies including handbook on the first national general investigation of pollution sources, handbook on production/pollution discharge coefficient of industrial sources, handbook on production/pollution discharge coefficient of domestic sources and handbook on concentrated pollution control facilities. They also provided training for more than 500,000 investigators, investigation instructors and data entry operators, completing door-to-door survey and data input on pollution from industrial, agricultural and domestic sources and concentrated pollution control facilities.

Macro strategic study on China's environment has been basically finished. The study produced the strategic thought of “putting human development first, scientific development, environmental security and ecological civilization” and such principle as giving first priority to prevention and combining prevention and control; systematic management and comprehensive treatment; taking people's well-being as fundamental and promoting environmental protection step by step; let government play the leading role and encourage public participation. A series of policy recommendations were raised to pave the way for improving environmental management mechanism, straightening out thoughts on environmental protection in the twelfth Five-Year Plan period and promoting ecological civilization.

The special program on water pollution control kicked off. Ministry of Science and Technology, NDRC and Ministry of Finance formally approved the implementing scheme. Drafting of the implementation plan for the eleventh Five-Year Plan (2008-2010) and 2008 implementation plan were completed. Among the 238 research projects under the 33 projects, 21 projects were launched in 2008 including 105 research projects. Ministry of Finance reviewed the projects kicked off in 2008 and approved a budgetary expenditure of 480 million Yuan for the program in 2008. The first startup funds of 144 million Yuan were allocated.

rural areas; ninth, higher requirement for emergency response work; tenth, imposing severer sanctions against illegal discharge of pollutants.

**【 NPC listened the report on the prevention and control of water pollution 】** Entrusted by the State Council, Minister Zhou Shengxian of Ministry of Environmental Protection reported to the 6<sup>th</sup> meeting of the Standing Committee of the 11<sup>th</sup> NPC on the progress of prevention and control of water pollution in China on December 25, 2008, which was spoke highly by the NPC deputies.

The report said, progress was made in the prevention and control of water pollution across China in 2008 with stable overall water environment quality. China National

Environmental Protection Plan in the “11<sup>th</sup> Five Years was under steady implementation. The work on ensuring the security of drinking water has been strengthened. The prevention and control of water pollution of key river basins has made some progress. The construction of urban sewage treatment facilities has been accelerated, rural environmental protection work has made active progress. The prevention and control of ship pollution has been enhanced. The laws, regulations and policies on the prevention and control of water pollution have been under continuous improvement with increasing efforts in law enforcement of preventing and controlling water pollution. The support to the prevention and control of water pollution enjoyed increasing enhancement.

## Environmental Communications and Education

To thoroughly implement Scientific Outlook on Development, the environmental communications and education work gave much attention to historic transformation of environmental protection and tried to promote ecological civilization. Publicity was carried out in a solid manner and environmental education was progressing on all fronts, creating a sound atmosphere for public opinion.

**News Coverage Leads Public Opinion** News reports were well-received as they featured the key work of environmental protection, made careful plan for news in focus to provide the right guidance for public opinion and followed closely on various public concerns. In 2008, a total of 52 news releases were collected, edited and published and 676 articles on environmental protection were covered and broadcasted in cooperation with major central news media. MEP accepted 94 applications for interview from domestic media and 35 from foreign media. Large scale publicity was launched on major moves and policies of environmental protection and hot issues including pollution reduction, water pollution control in key river basins, environmental economic policies and 6.5 World Environment Day. Active efforts were made to organize news briefings on environmental protection during such events as CPC and CPPCC sessions and the Olympic Games. Reports were filed particularly on the dual reduction of COD and SO<sub>2</sub> discharges, a shift in pollution control from passive response to proactive actions and concrete work in environmental protection towards a historic transformation.

**Publicity and Education Create Favorable Atmosphere** A national contest on environmental protection and other activities were held to promote Green Olympics and Environmentally Friendly Society, the China theme for World Environment Day. MEP participated in the organization of review on China's 30-year reform and opening up, demonstrating the grand course and achievements of environmental protection since China's opening up to the outside world. Since 2008, MEP has started receiving environmental volunteers to encourage them to promote environmental protection and guide them to conduct well-organized educational activities.

## Marine Environment

### General Situation

#### Marine Water Quality

In general, coastal sea waters across China were under slight pollution. The coastal marine water quality became slightly better compared with that of last year. Most coastal sea waters were clean and the water quality of high sea waters kept good.

In 2008, a total of 281,012 km<sup>2</sup> coastal areas were under monitoring. Among them, 212,270 km<sup>2</sup> met Grade I or II national marine water quality standard; 31,077 km<sup>2</sup> met Grade III standard; and 37,665 km<sup>2</sup> failed to meet Grade III standard.

The monitoring results showed that the overall coastal sea water quality became a little better than that of 2007. 70.4% met Grade I or II standard, up by 7.6 percentage points compared with that of 2007; 11.3% met Grade III standard, same as that of last year; 18.3% failed to meet Grade III standard, down by 7.1 percentage points.

Among the four big seas, the coastal waters of the Yellow

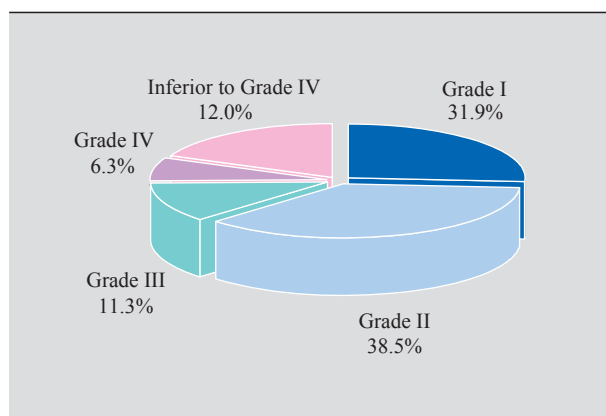
Sea and South China Sea enjoyed good water quality followed by the Bohai Sea. But the East China Sea had poor water quality. The marine water quality of Beibu Bay was excellent. The marine water quality of the Yellow River estuary was good with over 90% meeting Grade I or II standard. But Liaodong Bay and Jiaozhou Bay had poor water quality with less than 60% of the monitoring sites met Grade I or II standard, less than 30% failing to meet Grade IV standard. The marine water of other bays was very poor with over 40% monitoring sites failing to meet Grade IV standard. Among them, Hangzhou Bay had the worst quality with 100% failed to meet Grade IV standard. The percent of sea waters of the Bohai Bay, Yangtze River estuary, Pearl River estuary and Beibu Bay meeting Grade I or II standard went up by over 10% compared with that of last year.

**The Bohai Sea** Coastal sea areas of the Bohai Sea were under slight pollution. 67.4% met Grade I or II standard, up by 4.1 percentage points compared with that of 2007. 12.2% met or failed to meet Grade IV standard, down by 10.2 percentage points. Main pollutants were inorganic nitrogen, pH and lead.

**The Yellow Sea** The coastal sea areas of the Yellow Sea were good. 92.6% met Grade I or II standard, up by 7.4 percentage points compared with that of 2007. 3.8% met or failed to meet Grade IV standard, down by 1.7 percentage points. Main pollutants were inorganic nitrogen and activated phosphate.

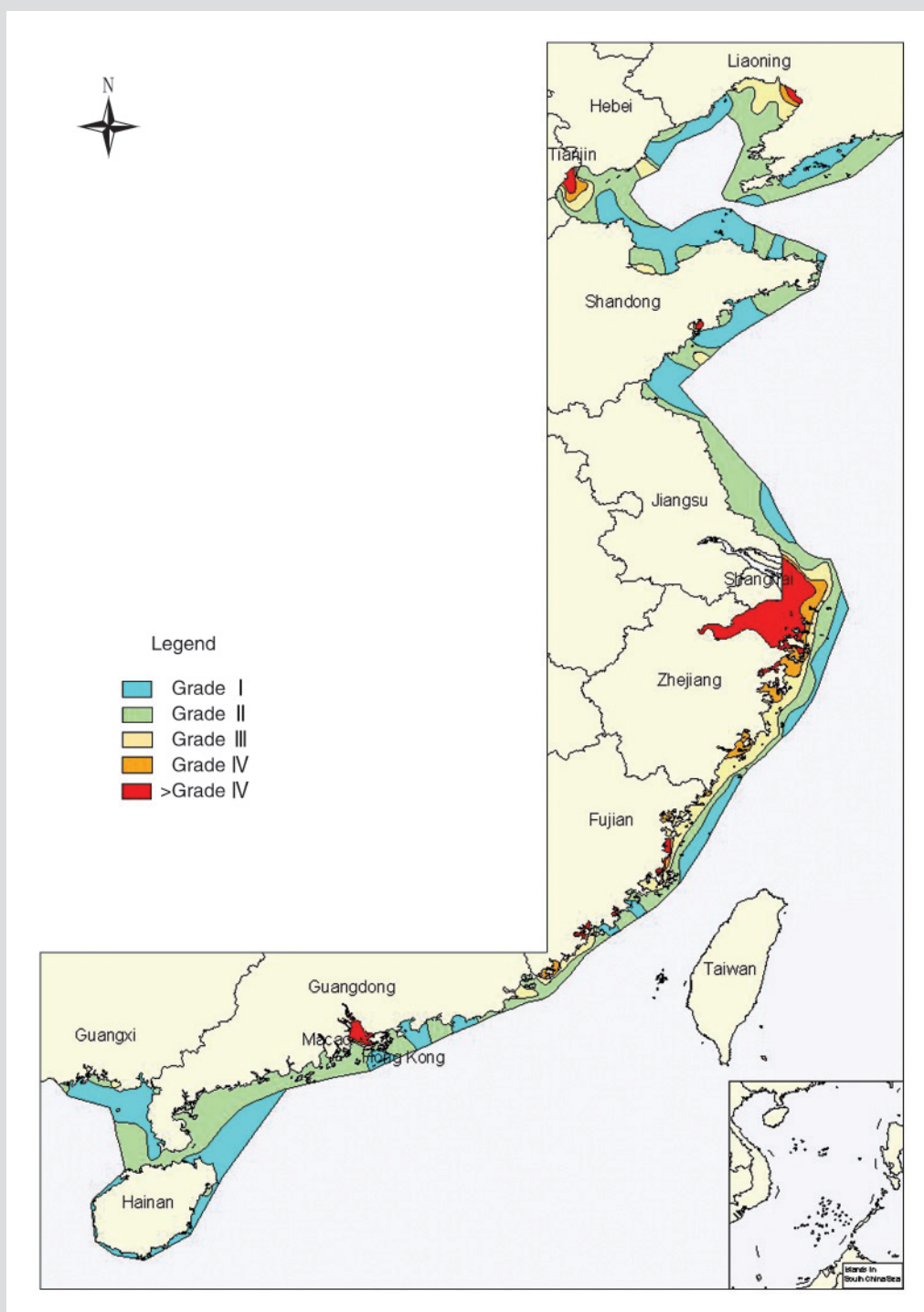
**The East China Sea** The coastal sea waters of the East China Sea were under intermediate pollution. 38.9% met Grade I or II standard, up by 10.5 percentage points compared with that of last year. 43.2% met or failed to meet Grade IV standard, down by 12.6 percentage points. Main pollutants were inorganic nitrogen and activated phosphate.

**The South China Sea** The coastal sea areas of the South China Sea were good, 89.3% met Grade I or II standard, up by 5.6 percentage points compared with that of 2007. 5.8% failed to meet Grade IV standard, down by 2.3 percentage points. Main pollutants were inorganic nitrogen, activated phosphate and pH.



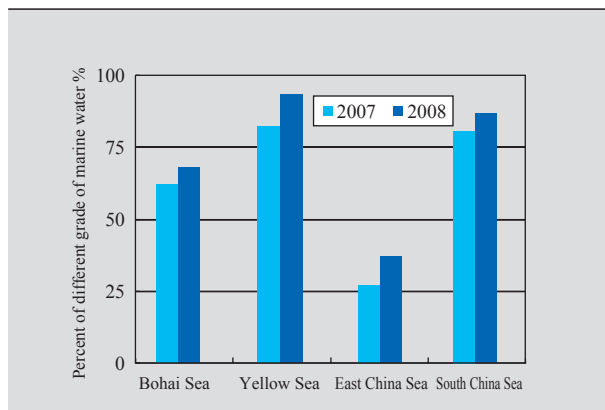
Water quality of coastal sea areas



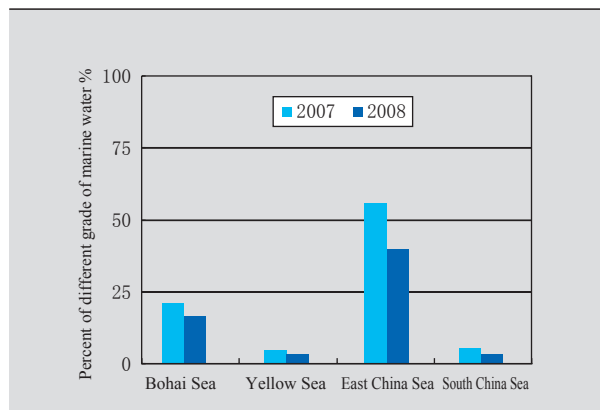


Water quality distribution of China's coastal sea areas





Percent of Grade I &amp; II water of the four big seas



Percent of Grade IV or worse water of the four big seas

## Sediment of coastal sea areas

In 2008, the general quality of coastal sea sediments in China was good. The integrated potential eco risk of sediment pollution was low. The sediments of some sea areas were subject to copper, cadmium, petroleum and PCB pollution.

## Pollutant residual in coastal sea shellfish

In 2008, parts of coastal sea waters of China were subject to lead, cadmium, arsenic and petroleum pollution. The residual concentration of lead, petroleum, cadmium, arsenic and DDT in the flesh of some coastal shellfish exceeded the criteria for Grade I quality of marine creature.

The statistics findings of many-year monitoring data showed that the residual petroleum level in coastal shellfish basically kept the same, while the residual concentrations of lead, DDT, PCB and Cd in some coastal shellfish showed declining trend.

## Land-based pollutants

**Sea-oriented rivers** The overall quality of 198 sea-oriented rivers under monitoring was relatively poor with the amount of pollutants bigger than total amount of pollutant directly discharged into the seas. The total in-flow amount of river pollutants to the East China Sea far exceeded that of other seas.

Water quality of the monitoring sections of sea-oriented rivers

Sea name	Water quality						
	I	II	III	IV	V	> V	Total
Bohai Sea	0	2	4	7	4	32	49
Yellow Sea	0	3	15	12	7	18	55
East China Sea	0	1	3	4	3	15	26
South China Sea	0	3	17	10	9	29	68
Total	0	9	39	33	23	94	198

The total amount of major pollutants of 198 sections of rivers flowing into the sea were 4.71 million t of permanganate

index, 833,000 t of ammonia nitrogen, 51600 t of petroleum and 296,000 t of total phosphorus.

Total amount of each kind of pollutants from sea-oriented rivers

Seas	Permanganate index (t)	Ammonia nitrogen (t)	Petroleum (t)	TP (t)
Bohai Sea	118,000	29000	1600	3000
Yellow Sea	251,000	40000	3500	6000
East China Sea	3114,000	593,000	25000	174,000
South China Sea	1227,000	171,000	21500	113,000
Total	4710,000	833,000	51600	296,000

**Direct discharge sources** The total amount of waste water from 526 industrial and domestic sources as well as comprehensive pollution discharge outlets with daily capacity larger than 100 t that directly discharged into the sea was 4.565

billion t. The discharged amount was 312900 t for COD, 1864 t for petroleum, 41531 t for ammonia nitrogen, 4213 t for TP, 0.25 t for mercury, 0.31 t for  $\text{Cr}^{6+}$ , 2.7 t for lead and 0.16 t for cadmium.

Pollution discharge from various direct sources

Type of pollutants	Waste water (100 million t)	COD (10000 t)	Petroleum (t)	Ammonia nitrogen(t)	TP(t)	Hg(t)	$\text{Cr}^{6+}$ (t)	Pb(t)	Cd(t)
Total	45.65	31.29	1864	41531	4213	0.25	0.31	2.7	0.16
Industry	15.41	4.31	154	2210	204	0.008	0.3	0.4	0.07
Domestic	7.36	7.85	703	12110	1384	-	-	-	-
Comprehensive	22.88	19.13	1007	27211	2625	0.24	0.006	2.3	0.09

Amount of major pollutants directly discharged into the four seas

Seas	Waste water (billion t)	COD (t)	Ammonia nitrogen	Petroleum (t)	TP (t)
Bohai Sea	0.132	7700	800	166.3	35.2
Yellow Sea	0.829	63300	6400	215.1	826.0
East China Sea	2.632	135200	18000	526.4	1092.2
South China Sea	0.972	106600	16300	956.4	2260.1

## Environment situation of marine fishery waters

The spawning sites, feeding sites and migrating passages of important marine fish, lobster, shellfish and marine nature reserves were mainly subject to the pollution by inorganic nitrogen, activated phosphate and petroleum. Part of fishery waters of the East China Sea, Yellow Sea, Bohai Sea and Pearl River estuary were subject to relatively heavy inorganic

nitrogen pollution. Part of fishery waters of the East China Sea, Bohai Sea and coastal fishery waters of the South China Sea suffered from relatively heavy activated phosphate pollution. Some of fishery waters of the East China Sea were subject to relatively heavy petroleum pollution. The scope of inorganic nitrogen and COD pollution had some rise but the pollution scope of activated phosphate and petroleum had slight drop compared with that of last year.

Key marine aquaculture areas were mainly under inorganic nitrogen and activated phosphate pollution. Some



parts of aquatic breeding areas of the South China Sea and East China Sea were under relatively heavy inorganic nitrogen pollution. Some aquatic breeding areas of the East China Sea suffered from relatively serious activated phosphate pollution. Petroleum pollution range had evident decline while the scope of inorganic nitrogen, activated phosphate and COD pollution went up compared with that of last year.

The sediments of marine fishery waters were mainly subject to cadmium, mercury, copper and petroleum pollution. Some fishery waters of the South China Sea were subject to relatively heavy pollution by petroleum, cadmium and mercury, while that of the East China Sea and Bohai Sea subject to relatively heavy copper pollution.

## Marine pollution accidents

**Ship pollution accidents** There were 136 ship pollution accidents along the coast with accumulated oil spill & leakage (oil spill, oil-containing waste water, chemicals and greasy filth etc.) at about 155 t, six of them had total spill & leakage volume over 10 t but less than 50 t with no incidence of the accident with spill or leakage volume over 50 t, showing significant drop of major pollution accidents compared with that of 2007.

**Red tides** In 2008, there were 68 red tides in all seas with accumulated area of 13738 km<sup>2</sup>, the frequency down by 14 times compared with that of last year; but the accumulated area up by 2128 km<sup>2</sup>. Among them, one occurred in the Bohai Sea covering an area of 30 km<sup>2</sup>; 12 times in the Yellow Sea with accumulated area of 1578 km<sup>2</sup>; 47 times in the East China Sea with accumulated area of 12070 km<sup>2</sup>; and 8 times in the South China Sea with accumulated area of 60 km<sup>2</sup>. Eleven times of the 68 were triggered by toxic or hazardous algae with accumulated area of about 610 km<sup>2</sup>, accounting for 16.2% of total times and 4.4% of the accumulated area respectively, down by 15.0% and 12.0% respectively compared with that of last year.

In 2008, there were 24 red tides with area larger than 100 km<sup>2</sup> in coastal seas of China, their accumulated area was 12438 km<sup>2</sup>. Among them, 3 times each had affected area larger than 1000 km<sup>2</sup> with accumulated area of 5850 km<sup>2</sup>. The East China Sea still had the most occurrences with the frequency and accumulated area accounting for 69.1% and 87.9% respectively.

## Measures and Actions

### [ China National Program of Action for the Protection

### of the Marine Environment from Land-based Activities ]

“China National Program of Action for the Protection of the Marine Environment from Land-based Activities” (hereinafter referred to as “China NPA”) is an important component of the Global Program of Action for the Protection of the Marine Environment from Land-based Activities of UNEP (hereinafter referred to as “GPA”). In 2008, based on the completion of the National Report of China on the Protection of the Marine Environment from Land-based Activities, the authority has proactively facilitated the compilation of “China NPA”.

### [ Progress in marine planning & legislation ]

The State has released the first master plan in marine field titled the Outline of National Plan for the Development of Marine Cause. It has printed out and distributed the Outline of National Plan for the Development of Marine Cause by Science & Technology (2008—2015) and the National Plan for the Development of Marine Standardization during the “11<sup>th</sup> Five-Year Plan” Period. It has released and carried out the Regulations on Sanctioning Actions in Violation of Laws and Disciplines Concerning the Use of Marine Waters.

### [ State Oceanic Administration deepened marine environmental protection work in the Bohai Sea ]

In 2008, the State Oceanic Administration according to the Marine Environmental Protection Law of the People's Republic of China and the functions of competent marine administrative department, organized relevant departments and scientific institutions as well as universities to formulate the Outline of the Plan for Three-dimensional Monitoring and Dynamic Assessment of Marine Environment of the Bohai Sea (2008—2012) in order to further enhance marine environmental protection of the Bohai Sea.

### [ Breakthrough in the development of marine special protected areas ]

In 2008, marine administrative department at all levels continued their enhancement in supervision and management of marine protected areas, steadily facilitated each activity concerning the development and management of marine protected areas. They have taken effective measures to make more efforts in the conservation of fragile marine eco systems such as mangroves, reef, gulf, islands, estuaries and beach wetlands. The competent national marine administrative department has approved the establishment of Jiangsu Haikou Gulf national special marine protected area on gulf ecology and natural heritage, Zhejiang Yushan Islands National Special Marine Protected Area, Shandong Dongying Yellow River Estuary Ecology National Special Marine Protected Area, Shandong Dongying Lijin Marine Benthos Ecology National Special Marine Protected Area and Shandong Dongying Estuary Shallow Sea Shellfish Ecology National Special Marine Protected Area.

# Atmospheric Environment

## General Situation

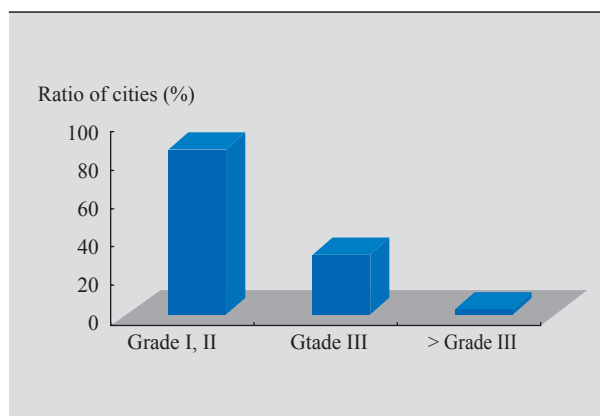
The overall urban air quality of China was good, better than that of last year but some cities were still subject to relatively heavy pollution. The acid rain distribution areas in China remained stable, however, acid rain pollution was still relatively heavy.

### Air Quality

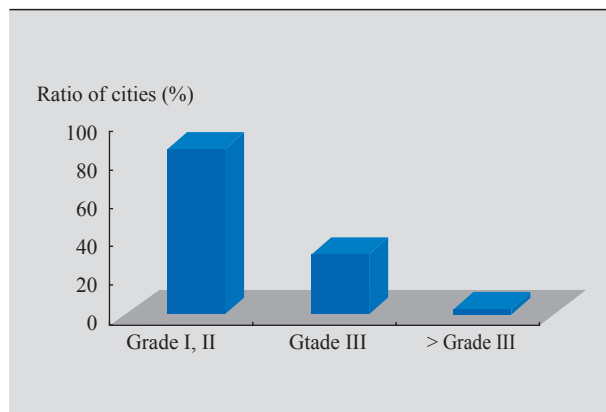
In 2008, a total of 519 cities in China reported their air quality. 21 (taking up 4.0%) of them met Grade I national air quality standard; 378 (taking up 72.8%) met Grade II standard; 113 (taking up 21.8%) met Grade III standard and 7 (accounting for 1.4%) failed to meet Grade III standard. 71.6% of cities at prefecture level or above across China met Grade I or II standard, 85.6% cities at county level or above met Grade I or II standard.

**Cities at or above prefecture level** Among the cities at prefecture level or above, 2.2% met Grade I national air quality standard, 69.4% met Grade II standard, 26.9% met Grade III standard and 1.5% failed to meet Grade III standard.

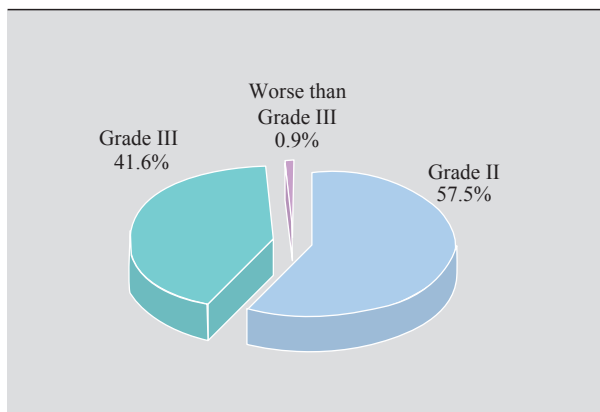
The annual average  $PM_{10}$  concentration of 81.5% cities met Grade II standard, while 0.6% failed to meet Grade III standard. The  $PM_{10}$  concentration of over 20% cities at prefecture level in eight provinces including Shandong, Shaanxi, Xinjiang, Inner Mongolia, Hubei, Jiangsu, Gansu and Hunan subject to environmental statistics failed to meet Grade II air quality standard.



Percent of cities with different concentration of sulfur dioxide



Percent of cities with different  $PM_{10}$  concentration



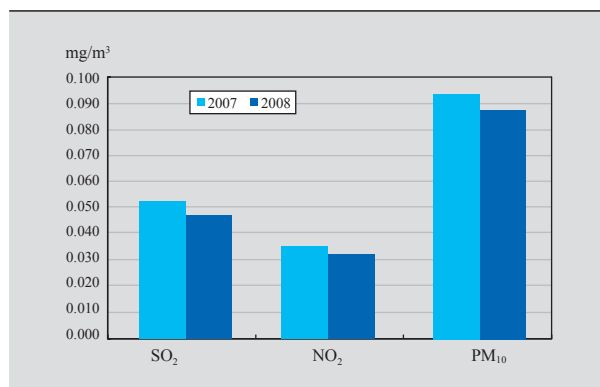
Air quality distribution of key cities

The annual average of SO<sub>2</sub> concentration of 85.2% cities met Grade I or II standard, while 0.6% of them failed to meet Grade III standard. More than 20% of the prefecture level cities in 7 provinces including Guizhou, Shandong, Hebei, Shanxi, Inner Mongolia, Sichuan and Hunan subject to environmental statistics failed to meet Grade II air quality standard in terms of SO<sub>2</sub>.

The annual average of NO<sub>2</sub> concentration of all cities at prefecture level or above met Grade II standard and 87.7% of them met Grade I standard.

**Key cities** The urban air quality of 113 key cities on environmental protection enjoyed some improvement. 57.5% of them met Grade II standard; 41.6% met Grade III standard and 0.9% failed to meet Grade III standard. The percent of cities meeting air quality standard went up by 13.3 percentage points compared with that of last year, but there was no change of the percent of cities failing to meet Grade III standard.

The overall average NO<sub>2</sub> concentration of key cities on environmental protection in 2008 was similar to that of 2007, but SO<sub>2</sub> and PM<sub>10</sub> concentrations had some drop.



Annual comparison of major pollutant concentrations of key cities

## Acid Rain

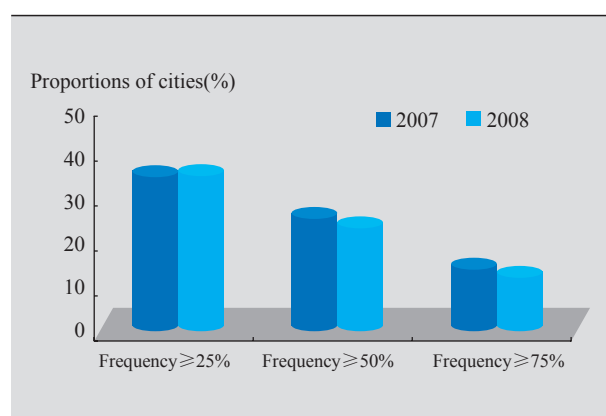
**Acid rain frequency** Among the 477 cities (counties) under monitoring, 252 had acid rain, taking up 52.8%. 164 cities had acid rain frequency over 25%, accounting for 34.4%; 55 cities had acid rain frequency over 75%, accounting for 11.5%.

Acid rain frequency statistics in China

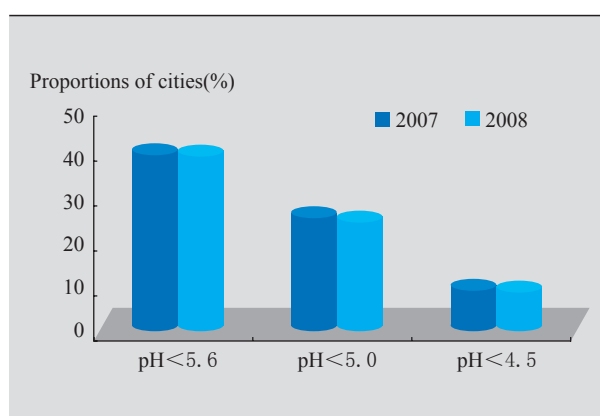
Acid rain frequency (%)	0	0 ~ 25%	25% ~ 50%	50% ~ 75%	≥ 75%
Amount of city	225	88	57	52	55
Percent (%)	47.2	18.4	11.9	10.9	11.5

**Precipitation Acidity** The percent of cities with relatively heavy acid rain (pH <5.0) went down by 1.1 percentage point

compared with that of last year, while the percent of cities with heavy acid rain (pH <4.5) kept the same.



Comparison of the percent of cities with different acid rain frequency



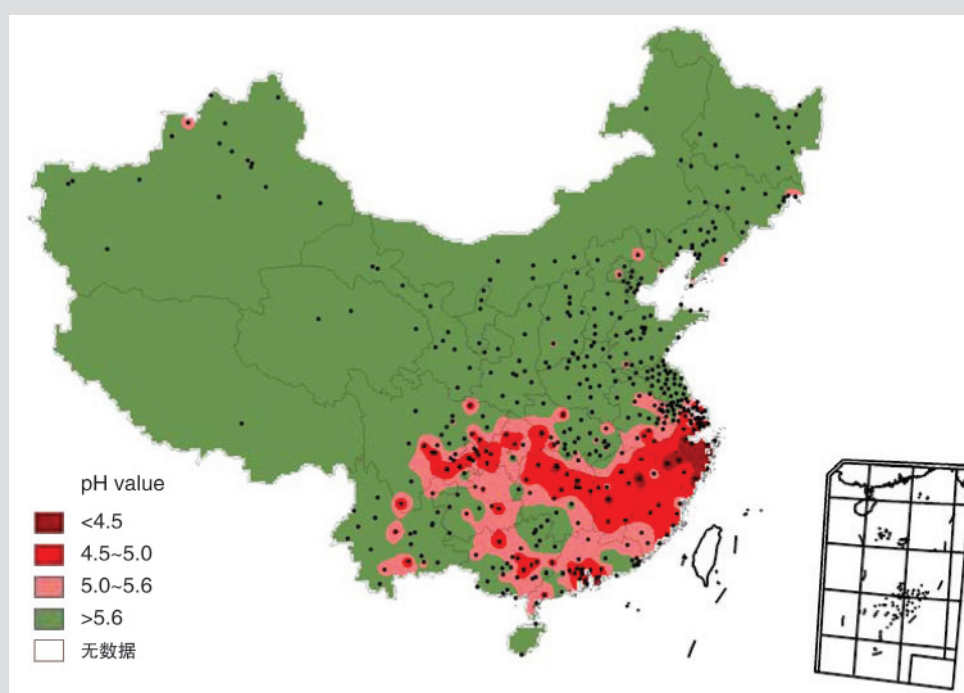
Comparison of percent of cities with different annual average of Precipitation pH

Annual average precipitation pH of China

Annual average pH	< 4.5	4.5 ~ 5.0	5.0 ~ 5.6	5.6 ~ 7.0	≥ 7.0
Amount of cities	42	73	69	205	88
Percent (%)	8.8	15.3	14.5	43.0	18.4

**Acid rain distribution** Acid rain mainly concentrated in the region south to the Yangtze River and east to Sichuan and Yunnan, including Zhejiang, Fujian, Jiangxi, most of Hunan

and Chongqing as well as the Yangtze River delta and Pearl River delta. The acid rain distribution areas across China maintained stable compared with that of last year.



Isoline of annual average pH value of precipitation in China

## Emissions of Major Pollutants from waste Gas

In 2008, total emission was 23.212 million t for SO<sub>2</sub>, 9.016 million t for smoke and 5.849 million t for industrial dust;

down by 5.9%, 8.6% and 16.3% respectively compared with that of 2007.

The emissions of major air pollutants in waste gas in China

Year \ Item	SO <sub>2</sub> Emission (10,000 t)			Smoke emission (10,000 t)			Industrial dust (10,000 t)
	Total	Industrial	Domestic	Total	Industrial	Domestic	
2006	2588.8	2234.8	354.0	1088.8	864.5	224.3	808.4
2007	2468.1	2140.0	328.1	986.6	771.1	215.5	698.7
2008	2321.2	1991.3	329.9	901.6	670.7	230.9	584.9



## Measures and Actions

**【 The Implementation of China Stage III Standard for Vehicle Emissions 】** In order to implement the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution and control vehicle emission pollution, China officially began the implementation of the stage III limit of the *Limit and Measurement Method for the*

*Emissions of Pollutants of Light Duty Vehicles (China Stage III and IV)* (GB18352.3-2005) (hereinafter referred to as “China stage III standard”) from July 1, 2008

**【 Beijing carried out National Stage IV Standard for Vehicle Emissions beginning from March 1, 2008 】**

According to Beijing Environmental Protection Plan during the “11<sup>th</sup> Five-Year Plan” period and the requirement for holding 2008 Summer Olympic Games, Beijing began implementing National IV vehicle emission standard from March 1, 2008 in two stages, which is equivalent to EU IV standard.

## Environmental Emergency Response to the Wenchuan Earthquake

An 8-magnitude quake struck Wenchuan County, Sichuan Province on May 12, 2008. The CPC Central Committee and the State Council paid high attention to the situation and Secretary General Hu Jintao made an important instruction. The State Council established a headquarters for disaster relief headed by Premier Wen Jiabao and set up 8 working groups for assistance, forecast and monitoring, medical service, resettlement, infrastructure, production, public security and publicity, which consisted of related government departments, army, armed police, local Party Committee and government principals. As arranged by the central government, MEP inspected most of the industrial and mining companies, sewage treatment plants and refuse land filling sites in the hard-hit areas and provided guidance to disaster relief operations to prevent secondary pollution.

MEP immediately invoked the emergency response plan and made active effort to address problems, ensuring environmental security in the disaster hit area. First, it formulated 37 technical guidelines and documents on protection of drinking water sources and water quality monitoring, medical waste disposal, treatment of domestic sewage and refuse of temporary settlements as well as cleanup of hazardous waste and chemicals. This proved to be strong technical support for pollution prevention and control in the area. Second, prompt efforts were made to dispel hidden danger to environmental security to prevent secondary environmental pollution. Aimed to protect nuclear and radiation safety and drinking water safety, environmental protection workers inspected petrochemical companies, nuclear facilities and radioactive sources, chemical materials and oil depot, sewage treatment plants, refuse landfill sites, tailing pond and drinking water sources, altogether 10,237 companies. Preventive measures were taken to all major hidden environmental dangers found and no serious impact was made on the environment. Third, emergency monitoring was conducted to follow up environmental situation in the disaster area. Emergency environmental monitoring scheme for quake hit area was developed in no time and over 480 people were transferred from 21 provinces and cities to make constant monitoring on drinking water sources, surface water, ambient air, pollution sources and ecology. Fourth, related work was planned for post disaster reconstruction. In response to growing environmental issues such as extensive use of epidemic prevention medicament and disinfectant, exudates of putrescent corpse, medical waste and domestic pollutants, which posed mounting threat to the environment, a project was launched on assessment of post disaster environmental security and countermeasures.



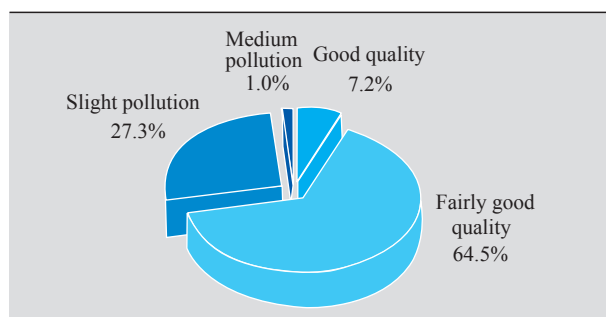
## Acoustic Environment

### General Situation

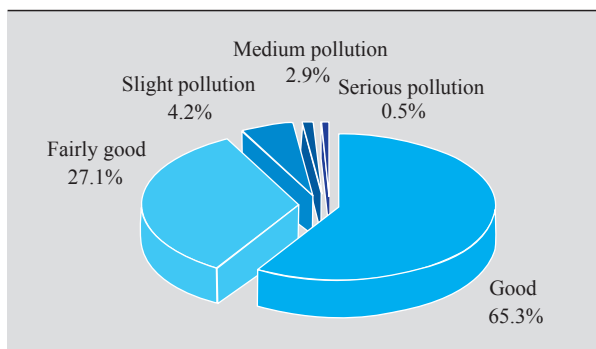
71.7% of the cities across the country enjoyed good or fairly good area-wide acoustic environment, and 75.2% of the 113 key cities on environmental protection managed to do so. 65.3% of the cities in China enjoyed good road traffic acoustic environment, and 93.8% of the 113 key cities on environmental protection had good or fairly good road traffic acoustic environment. 86.4% of the urban function zones met environmental noise standards during day time, and 74.7% of them met the standards at night.

**Regional Environmental Noise** 7.2% of the 392 cities under national monitoring program enjoyed good area-wide acoustic environment, 64.5% of them enjoyed fairly good area-wide acoustic environment, 27.3% suffered from slight noise pollution, and 1.0% suffered from intermediate noise pollution. Compared with last year, the proportion of cities enjoying good regional acoustic environment went up by 1.2 percentage points, the proportion of cities with relatively good regional acoustic environment dropped by 1.7 percentage points, the proportion of cities with slight noise pollution went up by 0.9 percentage point, and that with intermediate noise pollution dropped by 0.4 percentage point.

The area-wide sound equivalent levels in 113 key cities on environmental protection ranged between 45.7 and 61.1 dB(A). 75.2% of these cities enjoyed good or fairly good area-wide acoustic environment, 23.9% suffered from slight pollution, while 0.9% from medium pollution.



Quality of area-wide acoustic environment



Quality of urban road traffic acoustic environment

**Road Traffic Noise** 65.3% of the 384 cities under national monitoring program enjoyed good road traffic acoustic environment, 27.1% enjoyed fairly good traffic acoustic environment, 4.2% experienced slight noise pollution, 2.9% suffered from intermediate noise pollution, and 0.5% suffered from serious pollution. Compared with last year, cities with good traffic acoustic environment went up by 6.7 percentage points, the proportion of cities with relatively good road traffic acoustic environment went down by 6.7 percentage points, the proportion of cities with slight traffic noise pollution dropped by 1.5 percentage points, the proportion of cities with intermediate traffic noise pollution rose by 1.8% percentage points, and that with heavy traffic noise pollution went down by 0.3% percentage point.

57.5% of the 113 key cities on environmental protection enjoyed good road traffic acoustic environment, 36.3% enjoyed fairly good such environment, 4.4% suffered from slight noise pollution, and 1.8% from intermediate noise pollution.

**Noise in Urban Function Zones** In the 242 cities under national monitoring program, 6,947 site-times of the monitored sites in their function zones met the daytime acoustic standards all over the year, accounting for 86.4% of the total; 6,007 site-times met night acoustic standards all over the year, accounting for 74.7% of the total. The up-to-standard rate at daytime was higher than that at night in the function zones, and the Type 3 function zones had better performances than others.





Up-to-standard status of the monitored sites in urban function zones

Type of the function zones	Type 0		Type 1		Type 2		Type 3		Type 4	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Up-to-standard site-times	107	92	1634	1464	1994	1847	1472	1380	1740	1224
Monitoring site-times	199	199	1928	1928	2309	2309	1590	1590	2014	2014
Up-to-standard rate (%)	53.8	46.2	84.8	75.9	86.4	80.0	92.6	86.8	86.4	60.8

## Measures and Actions

**【 New Noise Standards Going into Effect 】** The amended *Environmental Quality Standard for Noise (GB3096-2008)* and *Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008)* as well as the new *Emission Standard for Community Noise (GB 22337-2008)* went to effect as of October 1, 2008. These new standards had the following characteristics: first, they have adjusted the acoustic quality standard, elaborated the requirements for acoustic environmental quality in function

zones and improved the requirements for acoustic quality in the neighborhood of railways; second, they have extended the application of acoustic quality standards from urban areas to rural areas; third, they have adjusted and clarified the monitoring requirements for noise emission standards; fourth, the noise emission standard for community, a source of noise specified in the *Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise*, is enacted; fifth, it is the first time to provide the limits and monitoring and evaluation approaches of low-frequency noise in the noise emission standards for industrial enterprises and communities.

## Environmental Emergency Response for the Cold and Snowstorm in South China

From January 10 to February 2, 2008, South China was hit hard by an unprecedented cold and snowstorm, leading to severe damage to transport, power transmission and communications system. To cope with potential environmental risks, the former SEPA issued Environmental Technical Measures for Cold and Snowstorm Disaster in South China, guiding local EPBs to investigate hidden dangers, particularly drinking water sources, densely populated areas and other environmental sensitive regions, such high-risk companies as chemical and pharmaceutical companies, and urging related departments to immediately remove snow applied with snow-melting agent. Requirement was also made on strengthened environmental regulation, close check up of damage to pollution control and online monitoring equipment of local enterprises. Monitoring was reinforced to watch for possible impact on water environment after snow melting, which ensured drinking water safety in the disaster area. Only one ordinary accident of water pollution caused by snow-melting agent took place during the disaster. No major environmental pollution accident happened.

## Solid Waste

### General Situation

In 2008, the generated amount of industrial solid wastes across the country was 1,901.27 million tons, up by 8.3% than last year. 7.82 million tons of them were discharged, down by 34.7%. 1,234.82 million tons were comprehensively utilized

(including utilization of wastes stored in previous years), accounting for 64.9% of the total output; 218.83 million tons were stored, accounting for 11.5%, and 482.91 million tons were disposed, accounting for 25.4%. The amount of hazardous wastes reached 13.57 million tons, 8.19 million tons of them were comprehensively utilized (including utilization of wastes stored in previous years), 1.96 million tons stored, and 3.89 million tons disposed.

The generation and disposal of industrial solid wastes in China in 2008

Generated amount (10,000 t)		Comprehensively utilized (10,000 t)		Stored (10,000 t)		Disposed (10,000 t)	
Total	Hazardous waste	Total	Hazardous waste	Total	Hazardous waste	Total	Hazardous waste
190127	1357.0	123482	819	21883	196	48291	389

### Measures and Actions

**【 Information Sharing on the Prevention and Control of Environmental Pollution by Solid Wastes in Large and Medium-sized Cities 】** According to the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste and Guidelines on Information Sharing on Prevention and Control of Environmental Pollution by Solid Wastes in Large and Medium-sized Cities (SEPA Bulletin, No.33, 2006)*, 206 cities issued information to the public about the prevention and control of environmental pollution by solid wastes in 2008.

**【 Examination and Approval of Imported Wastes 】** In 2008, MEP, together with Ministry of Commerce, NDRC, General Administration of Customs, and General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), issued the *Catalogue of Imported Wastes in 2008 (Bulletin No.11, 2008)*. MEP also issued *Circular on Disclosing the List of Entities for Identification of the Properties of Solid Wastes and the Identification Procedures (MEP documents, No.18, 2008)*, clarifying the entities and procedures for identification of imported wastes, suspending by law the applications handed in by 17 importers

of solid wastes, and issuing 10,397 licenses for import of solid wastes to 2,868 processors and users of them.

**【 International Cooperation on Management of Waste Import 】** In 2008, MEP enhanced the international cooperation with relevant countries and regions on control of transboundary movement of wastes. It organized the 5<sup>th</sup> working meeting of Mainland and Hong Kong on cooperation on the control of transboundary movement of wastes, signed *China-Netherlands Agreement on Transboundary Movement of Wastes* with Netherlands Ministry of Housing, Spatial Planning and the Environment, organized the 2nd Sino-Japanese Director General Dialogue on Solid Wastes, attended the 2008 Annual Meeting of IMPEL/TFS on Implementation of EU Waste Transfer Directive, and enhanced the information exchange with relevant countries on the control of transboundary movement of wastes as well as joint examination of permits, exchanging 200 pieces of information all over the year.

**【 Approval of Import of Hazardous Wastes 】** The *Measures on the Administration of Import of Hazardous Waste* issued by MEP (No.47, order of SEPA) went to effect as of March 11, 2008. MEP handled 24 applications for export of hazardous wastes in 2008, including 11 from mainland and 13 from Taiwan. 13,991.8 tons of hazardous wastes were applied for export, including 6,841.8 tons from mainland and



7,150 tons from Taiwan. The importers were mainly Belgium, Singapore, Japan, Germany, France and South Korea.

#### **【 Treatment of Pollution by Chromium Residues 】**

By the end of 2008, more than 1.3 million tons of chromium residues were disposed. Of the 19 provinces (municipalities directly under the Central Government) included in the *Program on Comprehensive Treatment of Pollution from Chromium Residues*, Shandong and Zhejiang provinces

had already disposed all of the Chromium residues; Hebei, Shanxi, Inner Mongolia, Hunan, Hubei, Jiangsu, Chongqing, Gansu, Shaanxi, Liaoning, and Yunnan provinces (municipality directly under the Central Government, autonomous region) had constructed chromium residue disposal facilities and put them into operation; and Tianjin, Jilin, Henan, Sichuan, Qinghai, and Xinjiang had their disposal facilities under way.

### **Environmental Quality Guarantee for Beijing Olympics and Paralympics**

To ensure up-to-standard environmental quality during the 29<sup>th</sup> Olympic Games and the 13<sup>th</sup> Paralympics, MEP, China Meteorological Administration and State Oceanic Administration actively cooperated with neighboring six provinces, municipalities and autonomous region (Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia and Shandong) and honored the commitment to a Green Olympics.

First, guarantee measures were made to ensure good air quality during the Olympics. Emergency Measures against Air Pollution under the Most Adverse Weather Conditions During Beijing Olympics and Paralympics were developed which would bring forward further control measures in three aspects: imposing complete or partial production suspension on a batch of enterprises; further restriction on car driving and no operation at construction sites.

Second, investigation was made to remove hidden environmental dangers. In cooperation with supervision and agricultural departments and local governments, MEP supervised the progress of key projects one by one under the Guarantee Measures against Air Pollution during the 29<sup>th</sup> Beijing Olympics. In all the six provinces, municipalities and autonomous region, 199 companies were shut down or suspended production, 683 companies or projects were subject to rectification and 181 companies were phased out. Oil gas control project, vehicle retrofitting and networking of online monitoring system for flue gas of 47 thermal power plants in Beijing, Tianjin and Hebei were completed as scheduled.

Third, environmental supervision was strengthened to safeguard environmental safety during the Olympics. To ensure safety of drinking water sources and nuclear safety, Beijing, Tianjin and Hebei held anti chemical terrorism emergency drill and emergency drill for dealing with nuclear and radiation terrorist attacks during 2008 Olympics.

Fourth, emergency measures were invoked to ensure up-to-standard environmental quality. On Aug. 7, environmental protection departments of Beijing, Tianjin and Hebei sent 5,000 person-times to have thorough examination of over 6,000 key pollution sources after a most unfavorable weather condition had turned up. Beijing, Tianjin and Hebei Province took emergency measures which suspended production of 105 companies in Beijing such as Shougang Company, Yanshan Petrochemical Co., Ltd. and Beijing Cement Plant. 14 companies in Tianjin were ordered to halt production and 164 in Hebei were subject to rectification, or restricted production and production stoppage. 48 cement plants were made emergency shutdown. 37 unqualified companies in Inner Mongolia were shut down and 6 power generation units failed to have pollution control facilities were suspended in Shandong. Shanxi Province also had 6 key pollution enterprises stop their operation.

During the Olympics, MEP worked with local authorities to make inspection of 34 cities above prefecture level in Beijing and its neighborhood, dispatching 15,000 person-times for complete monitoring of air quality in these cities. Examinations were made on over 300 Olympic guarantee projects, more than 200 key polluting companies under state control and investigation was made on over 10,000 pollution sources. Air quality of Beijing and its neighboring 33 cities under monitoring was measured good or very good. No single environmental emergency accident took place.

Thanks to joint efforts, air quality of Beijing during the Olympics and Paralympics was all at Grade I or II air quality standard. Compared with the same period of 2007, the level of the four major pollutants, namely SO<sub>2</sub>, inhalable particles, CO and NO<sub>x</sub>, all dropped by 50% or so, achieving the target of delivering good air quality for the Olympic Games.

# Radiation Environment

## General Situation

In 2008, the radiation environmental quality across the country was generally good. The ambient ionizing radiation level was basically stable, and the ionizing radiation levels in the vicinity of nuclear facilities and equipment were within the normal range. The ambient electromagnetic radiation level was generally good. Except that some parts of the high-power radiators had a little stronger comprehensive field strength than the national standard, other electromagnetic radiation facilities and equipment met the national standards for electromagnetic radiation.

**Ambient Ionizing Radiation** The automatic radiation monitoring stations in nationwide key cities did not observe abnormally high dose rate of  $\gamma$  penetrating radiation. The ambient  $\gamma$  radiation dose rate, the overall radioactivity of aerosol and air precipitum, and the radiation level of HTO in the air were within the normal range. The radiation levels of radio nuclides in the seven major waters, southwest and northwest rivers, rivers in Zhejiang and Fujian area, and major lakes and reservoirs did not change compared with previous monitoring results. The radioactive level of natural radio nuclides was the same as the values monitored during the nationwide survey on natural radioactive level from 1983 to 1990. In the monitoring program, the radioactive levels of total  $\alpha$  and total  $\beta$  in drinking water were lower than the guideline values specified in *Standards for Drinking Water Quality (GB5749-2006)*. The radioactive levels of artificial radio nuclides Sr-90 and Cs-137 in coastal seawater were within the limit of the *Sea Water Quality Standard (GB3097-1997)*. The contents of radionuclide in soils did not change compared with monitoring results of previous years, among others, the radioactive level of natural radionuclide was about the same as the values monitored during the nationwide survey on natural radioactive level from 1983 to 1990.

**Ionizing Radiation in the Vicinity of Nuclear Power Plants** Zhejiang Qinshan Nuclear Power Plant Base, Guangdong Dayawan/Ling'ao Nuclear Power Plant and Jiangsu Tianwan Nuclear Power Plant were in safe and normal operations, and the annual average  $\gamma$  penetrating

dose rates monitored by the automatic monitoring stations for peripheral radiation environment were 102.2nGy/h, 123.5nGy/h, and 101.1nGy/h respectively, within the natural background fluctuation range of local areas. The radioactive levels of Tritium in the air, rainwater, surface water and some biological samples in major residential quarters of Zhejiang Qinshan Nuclear Power Plant Base were a little higher than the background level before the nuclear power plant was in operation. The radioactive level of Tritium in the offshore seawater near the outlet of Guangdong Dayawan/Ling'ao Nuclear Power Plant was higher than the control sample, and traceable artificial radio nuclide Silver-110m was found in some of the oyster samples. However, compared with the monitoring results of previous years, these values were not in a rising trend, they contributed little to the added dose exposed to the public and were far lower than the limit specified by the State. The contents of radio nuclides in Jiangsu Tianwan Nuclear Power Plant were at about the same level as the background value before the power plant was in operation.

**Ionizing Radiation Level in the Vicinity of Other Nuclear Fuel Recycling Facilities** In the vicinity of China Institute of Atomic Energy (CIAE), Institute of Nuclear and New Energy Technology of Tsinghua University, Shandong Institute and Laboratory of Geological Sciences, Nuclear Power Institute of China and Northwest Institute of Nuclear Technology in Shaanxi Province, the  $\gamma$  radiation dose rate, radioactive level of aerosol and air precipitum, as well as the radio nuclide level in samples of surface water, soils and life forms were at the local environmental levels. The radioactive levels of total  $\alpha$  and total  $\beta$  in groundwater for drinking source were lower than the limits set by *Standards for Drinking Water Quality (GB5749-2006)*. In the vicinity of nuclear fuel producers and processors like Baotou Nuclear Fuel Plant, China Jianzhong Nuclear Fuel Co., Ltd., Shaanxi Uranium Enrichment Company, the 404 Ltd. of CNNC, Northwest Disposal Site for Low-and Medium-level Radioactive Solid Wastes, Lanzhou Uranium Enrichment Co., Ltd., Beilong Disposal Site for Low-and Medium-level Radioactive Solid Wastes, the  $\gamma$  radiation dose rate was still at the local environmental level. No abnormal level of radio nuclide due to the production, processing, and storage activities of the businesses was observed in other environmental media.



### **Ionizing Radiation in the Vicinity of Uranium Mines and Associated Radioactive Mines**

In the vicinity of uranium mines and water treatment facilities of Benxi Uranium Mine of Northern Uranium Co., Ltd. under CNNC, Zhejiang Quzhou Uranium Co., Ltd. under CNNC, Fuzhou Jin'an Uranium Co., Ltd. under CNNC, Ganzhou Jinrui Uranium Co., Ltd. under CNNC, Hengyang Xinhua Chemical Metallurgy Co., Ltd., Guilin Subsidiary of Jinyuan Uranium Co., Ltd. under CNNC, No.701 Mine of Nanning Xinyuan Nuclear Industrial Co., Ltd., No. 761 Mine of the former Nuclear Industrial Co., Ltd. in Guizhou City, No. 276 Plant of the former Nuclear Industrial Co., Ltd. in Guizhou City, Xinjiang Tianshan Uranium Co., Ltd. under CNNC, the Radon level in the air, and the radio nuclide including Uranium and Radium-226 in aerosol, ground water and life form samples saw no abnormal levels. However, in a few uranium mines and water treatment systems, the spilled minerals along the transportation routes caused higher  $\gamma$  radiation dose rates in several monitoring sites in the boundaries of the mines as well as the transportation routes before the mines were exploited. In the meantime, due to the wastewater emitted in previous years and the leakage of tailings dam, several monitoring sites in the vicinity of some uranium mines and water treatment facilities saw higher level of radio nuclide uranium and Radium-226 in surface water and bottom mud. The development and utilization activities in Baiyun'ebo mine affected local environment to some extent.

**Electromagnetic Radiation Level in the Vicinity of Electromagnetic Radiation Facilities** The ambient electromagnetic radiation level was generally good, but the level around several high-power radiators was higher than the national standards. The electromagnetic radiation levels in environmentally sensitive sites around the antennas of mobile communication stations were lower than the limit specified by *Regulations for Electromagnetic Radiation Protection (GB8702-88)* for the public exposure. The power frequency electric field strengths in environmentally sensitive sites around the power transmission lines and transformer substations were lower than 4kV/m, the evaluation standard of power frequency electric fields in residential areas, and the magnetic induction strengths were lower than 100 $\mu$ T, the limit to power frequency in case the public is exposed all day. Some monitoring sites in environmentally sensitive buildings near several television (FM) transmitting towers and medium-wave broadcasting transmitters had environmental comprehensive field strengths higher than the limit for public exposure.

## **Measures and Actions**

### **【 Intensifying the Regulation on Nuclear and Radiation Safety 】**

Efforts were made to enhance the supervision on and evaluation of the safe operation of nuclear power plants. The authority had finished over 60 evaluation assignments on safety reforming projects in nuclear power plants and intensified daily supervision and feedback to the operation experience. Efforts were also made to intensify the supervision on and evaluation of nuclear power plants under construction as well as proposed power plants. Two relatively independent nuclear safety evaluation teams were organized, the technical evaluation on the initial safety analysis reports of eight power units and the technical examination on their environmental impact assessment statements were completed, and the construction permits were secured. From April to July 2008, environmental protection departments at all levels examined 11,728 nuclear source owners on the safety and protection of these sources, finding out the amount of the owners and improving their safety levels.

### **【 Enhancing Monitoring on Radioactive Environment 】**

On the basis of the first group of national monitoring sites under the national radiation monitoring network, the country added 11 automatic monitoring stations for radiation environment in key cities, 10 land-based radiation monitoring sites, and 38 monitoring sites for waters. Early warning monitoring sites were established around four important nuclear and radiation facilities. It is the first time to set up 43 monitoring sites for electromagnetic environmental quality. Electromagnetic monitoring sites were also established around 41 major electromagnetic radiation facilities.

Efforts were made to enhance the establishment of emergency monitoring systems for sudden nuclear and radioactive accidents. The first-phase work was done for the capacity building project on nuclear and radiation monitoring, which was funded by the special fund on reduction of major pollutants under the Central Budget. The project included one enhanced substation for automatic and constant radiation monitoring, 31 standard substations for this and 68 basic substations, 31 provincial-level data collection centers, one national data collection center, as well as regular capacity building.



## Prevention and Control of Endemic Diseases

**Endemic Fluorosis** There were 1,135 counties nation wide affected by drinking water-related endemic fluorosis, involving 127,000 villages and 87.39 million population. 1.4 million people suffered from skeletal fluorosis due to drinking water problem. The disease was basically kept under control in 182 counties with 41.33 million people in total benefiting from intervention measures. Coal-burning induced endemic fluorosis haunted 178 counties, including 41,000 villages, 8.22 million households and 34.46 people population. 1.84 million cases of skeletal fluorosis were caused by coal burning. The situation was controllable in 24 counties and prevention and control measures helped 13.04 million people in total.

**Endemic Arsenism** Drinking water induced endemic arsenism affected 628 villages in 41 counties with a total population of 587,000 including 17,000 sufferers. A total of 523 villages improved access to drinking water, benefiting 377,000 people. There were 1,657 villages in 12 counties troubled by arsenism due to pollution from coal burning. Households in the disease area numbered 382,000 with 1.22 million villagers including 16,000 patients.

**Kaschin-Beck Disease** Kaschin-Beck disease was prevalent in 366 counties with a population of 105 million. 714,800 people were affected by it. It has been put under control or eliminated in 208 counties in total by far.

**Keshan Disease** By the end of 2008, Keshan Disease had affected 327 counties with 132 million people. Present sufferers numbered 41,200. The disease has been wiped out or controlled in accumulated 257 counties.

## Implementation and Deepening of Environmental Economic Policies

China introduced a series of environmental economic policies in 2008, such as green credit, green insurance, green trade and green taxation, which helped to cut down environmental cost of economic growth.

**Rapid development of green credit.** MEP, People's Bank of China (PBOC) and China Banking Regulatory Commission (CBRC) jointly improved the information exchange mechanism between environmental protection department and the financial sector. PBOC included over 30,000 entries of environmental information provided by MEP in its credit management system and CBRC forwarded the 13,000 entries of information on corporate environmental violations to commercial banks, which would serve as basis for banks to restrict and stop lending or recover loans from illegal companies. These measures have stimulated companies to control pollution and protect the environment. MEP issued green credit guidance to give instructions to banks and investment agencies so that they would identify environmental risks and foster green projects during financing.

**Steady progress of green insurance.** Under the guidance of MEP and China Insurance Regulatory Commission, insurance against environmental pollution liabilities was put on trial in some provinces and cities. Jiangsu Province introduced insurance against vessel pollution and other provinces and cities including Hubei, Hunan and Ningbo also unveiled related insurance products. In particular, the first environmental pollution case in Hunan Province was compensated through insurance. Wuhan municipal government allocated 2 million Yuan as government supporting fund to provide subsidy for policy holders at 50% of the premium. Shenyang City made environmental liability insurance an article of its Regulations on Prevention and Control of Hazardous Waste Pollution.

**Constantly deepening of green trade.** MEP issued a list of products with heavy pollution and high environmental risks, which included over 140 varieties with a total export value of more than USD2 billion. Ministry of Finance, State Administration of Taxation and Ministry of Commerce adjusted policies on tax rebate and processing trade accordingly, which played an important role for restricting export of these products and easing environmental pressure. Export volume of many such products has been greatly reduced.

**Continued improvement of green taxation policy.** Ministry of Finance, State Administration of Taxation and MEP jointly conducted investigation on environmental taxes. Preferential policies were made on income tax and value added tax of emission-reducing equipment and environment-friendly equipment. VAT preferential policy on products for comprehensive utilization was improved. Byproducts of desulphurization, medical waste utilization and power generation by sludge incineration would enjoy VAT preference.





## Nature and Ecology

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### General Situation

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#### Construction and Management of Nature Reserves

By the end of 2008, there were 2,538 nature reserves of all kinds at all levels in the country, covering a total of 148.943 million ha. Among them, there were 303 national level nature reserves, accounting for 11.9% of the total, covering 91.203 million ha, accounting for 61.2% of the total area. 28 nature reserves joined the UNESCO “Man and the Biosphere” network. Over 20 nature reserves became the World Natural Heritage Sites.

**Species** China boasts a large area with complex terrains and climate. It spans from north to south the frigid zone, temperate zone and tropical zone. Highlands and mountainous regions occupy 80% of its total land area. China has diversified ecological environment, which nurtures very rich wildlife resources. Beside fishes, China boasts about 2,619 vertebrate species, including 581 mammalian species, 1,331 bird species, 412 reptile species, and 295 amphibian species. There are several hundreds of rare and endangered wild animal species, such as the giant panda, Crested Ibis, snub-nosed monkey, South China tiger, *Procapra przewalskii*, *Tragopan caboti*, Chinese alligator, and Chinese Xenosaurs. China also has more than 30,000 species of higher plants. Over 17,000 species of plants such as Dawn Redwood, *Cathaya argyrophylla*, *Abies beshanzuensis* and *Henry Emmenopterys* can only be found in China.

**Wetland Biodiversity** China has abundant wetlands that fall into all kinds except tundra wetland. 28 kinds of wetlands, each covering more than 100 ha, totaled at 38.48 million ha. Among them there was 36.2 million ha of natural wetlands, including 5.94 million ha of coastal wetlands, 8.21 million ha of river wetlands, 8.35 million ha of lake wetlands, and 13.7 million ha of swamp wetlands. China's existing natural wetlands account for only 3.77% of the land area. For the moment, a national protection & conservation system with several kinds of conservation approaches dominated by nature reserves, wetland parks and wetland protection plot is taking shape. By the end of 2008, there had been more than 550 nature reserves for wetlands and 38 national wetland parks.

36 wetlands had been included in the *List of Wetlands of International Importance* under the *Ramsar Convention on Wetlands*. More than 17.9 million ha of natural wetlands in the country was under effective protection, accounting for about 49% of the total.

China enjoyed abundant wetland species. There are 31 species of animals under 12 families in 7 orders, 271 species of birds under 32 families in 12 orders, 122 species of reptiles under 13 families in 3 orders, 300 species of amphibians under 11 families in 3 orders, and more than 1,000 fish species. There are about 2,276 species of higher plants under 815 genus in 225 families in wetlands, including 267 species of mosses under 139 genus in 64 families, 70 species of fern under 42 genus in 27 families, 20 species of gymnosperm under 9 genus in 4 families, and 1,919 species of angiosperm under 625 genus in 130 families. The wetland plant species intensity was 0.0056 species/km<sup>2</sup>, twice of China's species intensity of 0.0028 species/km<sup>2</sup>.

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### Measures and Actions

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**[ Issuing National Plan for Dividing Ecological Function Zones ]** In July 2008, MEP and Chinese Academy of Sciences jointly released the *National Plan for Dividing Ecological Function Zones* (MEP No.35 Bulletin, 2008), it divides 216 ecological function zones, identifies 50 regions that are very important to national ecological security, and analyzes the ecological problems, ecological conservation and restriction measures of all kinds of ecological function zones.

**[ Printing and Distributing the Outline of National Plan for Protection of Ecologically Fragile Zones ]** In September 2008, MEP printed and distributed the Outline of National Plan for Protection of Ecologically Fragile Zones (hereinafter referred to as the Outline). The *Outline identified the concept and basic characteristics of ecologically fragile zones*, divided eight major such zones, and clarified major construction tasks and priority areas of these zones in the near future.

### 【 Comprehensive Management of Nature Reserves 】

MEP improved the mechanism to evaluate national-level nature reserves and amended the *Application Document for the Establishment of National Nature Reserves* and *Application Document for Adjustments to the Scope of National Nature Reserves and to Function Zones*. MEP organized the evaluation & review work in 2008, and as approved by the State Council, adjusted the scope of two national nature reserves which are Jinggangshan Nature Reserve in Jiangxi Province and Old Yellow River Course Nature Reserve in northern Henan Province. It also released the information on the scope, area and functions of 19 new national nature reserves.

MEP, together with Ministry of Land Resources, Ministry of Water Resources, Ministry of Agriculture, State Forestry Administration, Chinese Academy of Sciences, and State Oceanic Administration, evaluated 41 national nature reserves in Fujian, Jiangsu, Zhejiang, Anhui, Shanghai, Jiangxi, and Shandong provinces.

MEP and NDRC, Ministry of Land Resources, Ministry of Water Resources, Ministry of Agriculture, State Forestry Administration and State Oceanic Administration printed out and distributed the *Circular on Enhancing the Administration on the Adjustments to Nature Reserves*, which forbids random adjustments of nature reserves and provides that the adjustments to local nature reserves shall be approved by provincial governments.

MEP has intensified the supervision and management of the development and construction activities related to nature reserves, organized special inspections and investigated and sanctioned some environmental infringements that involve development activities in nature reserves.

**【 Biodiversity Conservation 】** MEP continued the national key investigation program on biological species resources and amended the standard for national key investigation program on biological species resources. It carried out trial project on evaluation of national biodiversity and selected Yunnan, Guangxi, and Jiangxi, which boasted rich biodiversity, as the first group of sites for the trial project. In 2008, the trial project was extended to Beijing, Jiangsu, Shandong, Hunan, and Qinghai.

In 2008, a group of endangered wild animal species were under effective protection, and the amount of wild animals under special State protection was on the rising trend in general. A total of 268 giant pandas and more than 1,000 Crested Ibis in the country were raised in pens. There were more frequent field activities of Manchurian tigers with expansion in their habitats. Steady progress has been made in returning endangered species such as crested ibis, elk, broncho, and Chinese alligator to the nature. A group of pilot

projects was organized to save and protect important species and extremely few species of wild plants under the wildlife protection project. The habitat of extremely endangered wild plants such as *Pinus squamaia* and *Manglietia decidua* were improved to some extent.

### 【 Construction of Aquatic Genetic Resources Protected Areas, Fish Proliferation and Artificial Releasing 】

Ministry of Agriculture made public 63 national protected areas (the second group) for aquatic genetic resources (MOA Bulletin, No.1130) on December 22, 2008. These protected areas distributed in 34 rivers and 20 lakes and reservoirs in the waters of Yangtze River, Yellow River, Heilongjiang River, and Pearl River as well as nine marine bays, islands and reefs and shoals of the Bohai Sea, Yellow Sea, East China Sea and South China Sea. They provided more protection to the species included in the *List of Aquatic Animal and Plant Resources with Economic Values under Special State Protection*. Some special species such as Yuanjiang Carp and Pengze Crucian Carp were new.

In 2008, 19.7 billion fish, shrimp and shellfish fries were cultivated across the country, up by 17.8% than last year, with investment of 311 million yuan, up by 1.0%. Among them, 5.7 billion fries with economic values were released in offshore waters and 14 billion were released in inland waters to facilitate their growth. The release scale and investment of this year were more than previous years.

**【 Protection of Agricultural Wild Plants 】** The Ministry of Agriculture focused on the survey on the conditions of 27 agricultural wild plants in 2008. The survey involved 363 counties (county-level cities) in 22 provinces (municipalities and autonomous regions directly under the Central Government). It included the basic information of the species, such as geographical distribution and area, ecological environment, population, varieties, and endangered status. GPS system was used in 894 important distribution sites. The survey staff saved and collected 1,081 sample-times of agricultural wild plant species and found a group of important or rare agricultural wild plant species. 22 new sites were set up for in-situ conservation of such wild plant species. After review & evaluation, seven varieties of excellent wild rice plant and eight varieties of wild soybean plant have been obtained. Researchers have also positioned and cloned a number of genes with high productivity, anti-degradation, and high-efficiency in absorbing nutrients.

### 【 Prevention and Control of Alien Invasive Species 】

In 2008, Ministry of Agriculture continued the campaign to wipe out the alien invasive species in 15 provinces (municipalities and autonomous regions directly under the Central Government) including Beijing, Tianjin, Hebei, Inner Mongolia, Liaoning, Zhejiang, Anhui, Jiangxi, Shandong,





Henan, Hubei, Hunan, Guangxi, Sichuan and Yunnan. Over 5.5 million person•times were mobilized in the whole year to eliminate 14 major invasive species including ragweed. More than 32 million mu•times of alien invasive species were rooted out, and over 75% of the invasive species were

wiped out. In the meantime, a general survey was conducted on 22 alien species with major threat to agriculture, such as *Flaveria bidentis*, *Mikania micrantha* and Golden Apple Snail. A database with the information on 427 alien invasive species were set up and improved.

### Carrying out Special Campaign on Environmental Protection and Strictly Punishing Environmental Infringements

In 2008, local Party Committees and governments were conscientious in implementing the important instruction on special environmental campaign made by Vice Premier Li Keqiang. The special campaign was carried out intensively in line with the arrangement of the eight ministries under the State Council. 1.6 million law enforcer/times were sent to inspect over 700,000 companies, which put 15,000 illegal companies on record, 100 more people under prosecution and blacklisted 3,500 cases. Ex post supervision was carried out on the 28,000 cases blacklisted nationwide since 2005, 8,000 plus papermaking companies rectified in 2007 and drinking water source protection areas. As a result, 97% of the cases completely corrected their wrongdoings, 641 paper mills violating industrial policies or total discharge standard were shut down, and 845 sewage outlets and illegal construction projects within Level I and Level II protection zones were eliminated. Examination was made on 1,530 urban sewage treatment plants and 935 landfill sites in operation. 82.4% of urban sewage treatment plants met national or local discharge standards and 85.5% of the sewage treatment plants installed online monitoring facilities at the outlets. The average operating efficiency of sewage treatment plants rose from 71.8% to 76.9%. Over 100 substandard landfill sites were ordered to rectify their problems within a set period of time. Meanwhile, local authorities also enhanced environmental law enforcement in key river basins with overall water quality improving in these areas. The special environmental campaign helped to solve a string of pollution problems affecting public health, promoted pollution reduction and improved environmental quality dramatically in part of the country.

### Severe and Major Environmental Pollution Accidents

There was a growing trend of emergent environmental accidents in China in 2008. 135 emergency accidents were handled directly by MEP, which was an increase of 22.7% as compared with 2007, which included 12 severe accidents (4 more than that of 2007), 31 major accidents (4 less than that of 2007) and 92 ordinary ones (increasing by 26). No extremely severe accidents took place.

Classified by causes, 57 out of the 135 accidents were due to work safety problems, accounting for 42.2% of the total, or 18 more than that of 2007; traffic accidents caused 25 environmental incidents, or 18.5% of the total, 3 less than that of 2007. 23 environmental accidents were triggered by corporate pollution discharge, making up 17.0% and growing by 9 as compared to the previous year. 17 were secondary environmental pollution accidents brought about by natural disasters, accounting for 12.6% of the total, which were 8 more than that of 2007. 13 environmental accidents were induced by other factors, taking up 9.7% of the total and reducing by 7 compared to the previous year.

Characterized by pollution types, there were 74 water pollution accidents (including 3 marine pollution accidents), 45 air pollution accidents, 2 caused by solid waste pollution and 4 by soil pollution. 10 accidents did not lead to environmental pollution.

# Land and Rural Environment

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## General Situation

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### General Situation of Land

China has 122 million ha of arable land, 12 million ha of orchards, 236 million ha of woodland, 262 million ha of pasture land, 25 million ha of lands for other agricultural purposes, 27 million ha residential areas and independent industrial and mining land, 2 million ha of transportation land, and 4 million ha of water conservancy facilities, with the rest as wilderness. Compared with last year, the net decrease of arable land area amounted to 19,300 ha, including 191,600 ha for construction purposes, 24,800 ha destroyed by natural disasters, 7,600 ha diverted for ecological purposes, and 24,900 ha due to adjustment of agricultural structure. A total of 248,900 ha of arable land disappeared due to the above four reasons. However, 229,600 ha of arable land were replenished by land restoration and development during the same period.

Water and soil erosion happened to 3.5692 million km<sup>2</sup> of land, accounting for 37.2% of the total land area. It included 1.6122 million km<sup>2</sup> due to water erosion, accounting for 16.8% of the total and 1.957 million km<sup>2</sup> due to wind erosion, accounting for 20.4% of the total.

### Rural Environmental Status

At present, the rural environmental problems are increasingly pressing and the situation is very serious. It is mainly reflected by such facts as aggravating domestic pollution, worsening non-point pollution, prominent industrial and mine pollution, hidden risks threatening drinking water safety, and the shift of pollution from urban areas to rural areas.

The rural drinking water improvement project benefited up to 894 million people, including 626 million people getting access to tap water, accounting for 70.0% of the total; 176 million people to wells with handle press, accounting for 19.7%; and 92 million people to other forms of water improvements, accounting for 10.3%. The rural population benefiting from drinking water improvement project accounted

for 93.6% of the total.

A total of 7.169 million new sanitary toilets had been constructed in 2008. By the end of 2008, 152 million households across the country had sanitary toilets, accounting for 59.7% of total.

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## Measures and Actions

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**【 Survey on Soil Pollution 】** The former State Environmental Protection Administration held the First National Meeting on Prevention and Control of Soil Pollution in Beijing on January 8, 2008, which called for doing well national survey on soil status, intensifying environmental supervision and comprehensive prevention and control of the agro-use soils, enhancing the environmental supervision of urban construction sites and abandoned polluted sites, expanding financial channels for the prevention and control of soil pollution, strengthening S&T supporting capacity, establishing and improving the laws, regulations and standards for soil protection, enhancing supervision and capacity building for soil monitoring, and enhancing the publicity and education in this regard. On June 6, 2008, Ministry of Environmental Protection printed out and distributed the Opinions on Enhancing the Prevention and Control of Soil Pollution, which clarified the guidelines, basic principles and main objectives for the prevention and control of soil pollution. The Opinions identifies that the priority area for the Prevention and Control of Soil Pollution is agro-use soil and soil at polluted sites. It calls for establishing the system for risk evaluation of polluted soils and a remedy system. The entities or individuals that cause pollution shall be responsible for restoring and treating polluted soils or ground water according to the “polluter pays” principle.

By the end of 2008, a total of 78,940 soil samples and farm produce samples were collected from 31 provinces (municipalities directly under the Central Government and autonomous regions), and 78,852 of these samples were analyzed and tested with nearly 3 million valid data and 8,575 figures.



**【 Carrying out Key Projects on Water and Soil Erosion Treatment 】** A total of 73,000 km<sup>2</sup> of area of the country were subject to the prevention and control of water and soil erosion, including 47,000 km<sup>2</sup> of them under comprehensive treatment, 26,000 km<sup>2</sup> sealed for vegetation growth, and 3,209 small watersheds under control. In 2008, 39,000 km<sup>2</sup> of area suffering from water and soil erosion was treated, 20,500 km<sup>2</sup> of area was sealed for protection and 1,829 small watersheds covering 15,800 km<sup>2</sup> were treated. A total of 650,000 ha of slope arable land and shoals across the country were reformed, 4.93 million ha of forests and grasslands were planted for water and soil conservation, and 1,239 silt dams were built in the Loess Plateau. The national key project on soil and water conservation has treated 17,600 km<sup>2</sup> of area suffering from water and soil loss, up by 8,000 km<sup>2</sup> compared with that of 2007. More than 1,200 counties across the country had completely sealed a total of 710,000 km<sup>2</sup> of area for water & soil conservation. Among them, 390,000 km<sup>2</sup> had enjoyed gradual ecological rehabilitation. The dependence upon ecological resilience has accelerated the prevention and control of soil and water erosion.

**【 The State Council held the National Teleconference on Rural Environmental Protection Work 】** The State Council held the National Teleconference on Rural Environmental Protection Work on July 24, the first of its kind since the founding of the People's Republic of China. Mr. Li Keqiang, Member of the Standing Committee of the Political Bureau of CPC Central Committee and Vice Premier of the State Council addressed the teleconference. The teleconference identifies the following main targets of the rural environmental protection: by 2010, the quality of source water in rural areas will be improved with certain progress in the prevention and control of the agricultural non-point pollution and effective control of risks & hazards to rural environment and health.

It is expected over 10% rise of such figures as the domestic sewage treatment rate, domestic garbage treatment rate, rate of using livestock & poultry feces as resources, application rate of the formula fertilization based on soil testing, and the application rate of low-toxicity and effective pesticides. By 2015, the living environment and ecological conditions in rural areas will be enjoy great improvement and so will the environmental supervision capacity.

**【 Offering Financial Reward as an Incentive Policy to Control Pollution and Promoting Comprehensive Environmental Treatment in Rural Areas 】** At the first National Teleconference on Rural Environmental Protection Work on July 24, 2008, the State Council put forward important policies to offer financial reward as an incentive to control pollution or as compensations for rural areas. It is the first time ever the Central Budget has set up a special fund for rural environmental protection, which allocated 500 million Yuan for this purpose.

**【 Biogas Project in Rural Areas and Development of Clean Village 】** In 2008, the Central Government increased the investment and raised the subsidy level with important progress in the household and breeding-farm biogas projects. 5.02 million rural households in the country got access to biogas pools in 2008. By the end of 2008, 30.5 million rural households got access to biogas pools, and there had been 35,000 biogas projects in breeding farms, more than 2,000 of which were large and small-sized breeding farms. The annual output of biogas in rural areas was about 12 billion m<sup>3</sup>, equivalent to 18.5 million tons of coal equivalent and increasing the income and cutting the expenditure of rural residents up to 15 billion Yuan every year.

In 2008, Ministry of Agriculture further extended the clean village project. Demonstration projects on clean village were conducted in 16 provinces, municipalities directly under

## Municipal Infrastructure Development

**Urban Greening** Green coverage in urban built-up areas totaled 1,357,161 ha, up from 35.3% of the previous year to 37.4%. There were 359,593 ha of public green space in cities nationwide with 9.69 sq. m. per capita, an increase of 0.71 sq. m. compared with that of 2007.

**Urban Sanitation** 154.72 million tons of domestic refuse were collected and transported in cities across the country, 4,691.76 million sq. m. swept and 68.32 million tons of human waste collected. There were 500 environmentally sound disposal facilities for domestic refuse with a treatment capacity of 315,283 tons per day. A total of 102.16 million tons of refuse were treated and the environmentally friendly treatment ratio reached 66.0%. Public toilets numbered 115,337 and cars devoted to environmental sanitation totaled 76,449.



the Central Government or cities under separate plan of the State Council, including Hunan, Anhui, Gansu, Henan, Hunan, and Jiangxi, and 117 demonstration villages had been built. In the demonstration villages, more than 90% of the domestic

sewage, household garbage, human and livestock feces, stalk & straw, and farmland wastes were collected and treated. By the end of 2008, the total amount of such demonstration villages exceeded 1,000.

### Raising the Threshold of Project Approval and Sticking to Scientific Approaches

In line with the CPC Central Committee and the State Council's strategic arrangement on maintaining economic growth, expanding domestic consumption and adjusting industrial structure, MEP opened a green channel for projects conforming to government policies and environmental protection threshold. Environmental requirements were strictly followed as for resource-and-energy intensive and heavy pollution projects, so that these projects would be kept from rapid expanding at source. Hence promoting steady yet fast economic growth.

Green channels were open to projects conducive to expanding domestic consumption such as those on people's well being, infrastructure, ecological environment and post disaster reconstruction, particularly major national programs. This move aimed to accelerate project progress and add to real economic volume. From November to December, 2008, MEP reviewed and approved 180 documents on environmental impact assessment of construction projects with a total investment of 610.25 billion Yuan. Among them, 43 projects related to infrastructure such as transportation and water resources with an investment of 180.92 billion Yuan.

Precautionary measures were made on construction projects against law. Projects under four categories were rejected including those clearly ordered phase-out by the government, under construction ban and incompliant with national industrial policies; projects leading to serious environmental pollution, inferior products, huge consumption of energy, resources and water and substandard pollution discharges; projects not meeting requirement of environmental function zones and not having indicators for total discharges and projects located in the core area of nature reserves and buffer zones. Meanwhile, stringent restrictions were placed on three conditions, namely projects related to environmental sensitive areas such as drinking water source protection areas, nature reserves, scenic spots and major ecological function zones; strict control of energy-guzzling and heavy pollution projects and eradicating reintroduction of phased out projects in the name of technical reform and boosting domestic consumption; abiding by the requirement of total pollution discharge and making the indicator a restraint on regional, industrial and corporate development. In 2008, MEP suspended approval on 156 energy and pollution intensive projects with a total investment of 473.7 billion Yuan, making considerable contribution to industrial restructuring and elimination of backward capacity.

### Successful Launch of Two Environment and Disaster Monitoring Satellites

The environment and disaster monitoring satellite constellation was the first special satellite intended for strengthening environmental monitoring and reducing disasters. The constellation was made up by four optical satellites and four synthetic aperture radar satellites. It featured large-scale, 24-hour dynamic environmental monitoring capacity. On Sep. 6, 2008, the two satellites (shortened as Huanjing-1A and Huanjing-1B) were launched at Taiyuan Satellite Launch Center, carried by the Long March II SMA rocket. Consisting of two medium resolution optical satellites, the satellite launch was the first step to construct a constellation, which contributed to a technical support system for environmental protection integrating sky, space and land. It would provide a platform for pollution mitigation, ecological change, disaster monitoring, warning, assessment and emergency response. Additionally, the satellites would greatly enhance international exchange and cooperation in the field of environmental protection.



# Forest

## General Situation

With vast area, complex natural climate conditions, rich plant species and forest resources, China has evident geographic distribution of its forest resources. From the North to the South, forest type is distributed as follows: coniferous forest, coniferous and broad-leaved mixed forest, deciduous broad-leaved forest, broad-leaved evergreen forest, seasonal rain forest and rain forests. According to the Sixth National Investigation on Forest Resources (1999-2003), forest area across the country totaled 174.91 million ha, an increase of 15.96 million ha, as compared with the findings of the Fifth National Investigation on Forests Resources (1994-1998). Forest coverage was 18.2%, up by 1.7 percentage points compared with that from the previous investigation. The total volume of standing timber reserve was 13.62 billion m<sup>3</sup>, and forest reserve was 12.46 billion m<sup>3</sup>. Forest area and forest reserve on a per capita basis was respectively 0.132 ha and 9.421 m<sup>3</sup>. Annual net growth of forest timber stood at 497 million m<sup>3</sup> while annual average logging volume was 365 million m<sup>3</sup>.

**Plant Diseases and Insect Pests** Around 11.41 million ha was affected by plant diseases and insect pests, including 8.46 million ha suffering from insect pests, 1.15 million ha from plant diseases and 1.51 million ha plagued by rats and rabbits. In addition, 291,000 ha were subject to the damage of hazardous plants. 7.61 million ha of forest throughout the country was protected by pest control measures, accounting for 66.7% of the damaged area. 6.11 million ha was treated with pollution-free prevention and control measures. In 2008, forest disasters caused by unsuccessful pest control accounted for 1.6% and rate of prevention and cure by pollution-free measures was 80.3%. 94.0% of plant seeds passed plant quarantine of place of origin and the accuracy of disease forecast reached 85.0%.

**Forest Fire** There occurred 14,144 forest fires (including 8,458 fire alarms, 5,673 ordinary fires and 13 major fires), affecting 184,495 ha, which caused damage to 52,539.1 ha forest with 174 casualties (97 died and 77 injured). The number of forest fire rose by 46.5% compared to the average

of the same period of the previous three years and affected forest area reduced by 69.2%. No severe fires took place throughout the year.

## Measures and Actions

**【 Full-scale Reform of Collectively Owned Forest System 】** On June 8, 2008, Opinions of the State Council and the CPC Central Committee on a Full-scale Reform of Collectively Owned Forest System (hereinafter referred to as Opinions) was issued, marking a new stage of the reform in forest field. The document identified the guidelines, principle and major task of the reform and proposed policies and measures to improve the forest right system.

The general objective of the reform was to make the property right clear and have household contract for forest land within five years. A set of policies were put forward to improve the property right system which included, first, to improve the management mechanism on logging; second, to regulate forest land and forest transfer; third, to establish a public finance system supporting the development of collectively owned forest; fourth, to improve reform on forestry investment and financing; and fifth, to strengthen public service of the forestry sector.

**【 Development of Key Projects in Forestry 】** In 2008, a total of 3.44 million ha of land was afforested by key forestry projects, an increase of 28.2% compared with that of 2007, accounting for 64.2% of the total forestation area. Among them, 1.89 million ha was planted by labor, 146,700 ha by plane and 1.41 million ha of non-stocked land and scattered wood land was enclosed for natural afforestation.

**Project for the Protection of Natural Forest Resources:** The project facilitated plantation of non-commercial forest across 1.01 million ha, including 191,600 ha by labor, 66,700 ha by plane and 750,600 ha of enclosed non-stocked land and scattered wood land for natural afforestation. 103.64 million ha of forest was cared through forest management.

**Grain for Green Project:** The project completed afforestation of 1.31 million ha (including 117,000 ha

plantation under the project of treating sand sources of Beijing and Tianjin), which included 12,000 ha farmland converted to forest, 939,800 ha forest planted in barren land and mountains and 355,600 ha enclosed non-stocked land and scattered wood land for natural afforestation.

**The Project of Treating Sand & Dust Sources of Beijing and Tianjin:** The project completed afforestation of 469,000 ha, including 198,100 ha by labor, 66,700 ha by plane and 204,200 ha of enclosed non-stocked land and scattered wood land for forest cultivation. Treatment of sand sources covered a total area of 742,400 ha, including 180,700 ha of grassland and 92,700 ha of small river basins. Over 17,300 water conservancy facilities were built. 10,300 people were moved due to ecological relocation involving 3,179 households.

**The Three North and the Yangtze River Basin Shelter Forest Construction Project:** The project turned 766,200 ha into forest, including 628,600 ha by labor, 13,300 ha by plane

and 124,200 ha of enclosed non-stocked land and scattered wood land for natural afforestation. Moreover, the project also reformed 23,100 ha of low-yield shelter forest.

**The Fast-growing Timber Forest Base Construction Project in Key Regions:** Fast-growing timber forest was planted across 5,294 ha including 3,975 ha in barren land and mountains and regenerated forest of 1,319 ha. Forest area grown through improved cultivation reached 41,800 ha.

**The Project of Comprehensive Treatment of Stony Desert:** In 2008, comprehensive treatment of stony desert in karst region was carried out smoothly. The central government allocated 400 million Yuan for forest protection in 26,100 ha, taking up 26% of the planned tasks. Among the completed tasks, mountain closure for natural afforestation covered 18,200 ha, accounting for 25% of the total enclosure plan, manual plantation took up 7,900 ha, or 29% of the artificial plantation plan.

## Implementation of International Environmental Conventions

**Montreal Protocol on Substances that Deplete the Ozone Layer** By the end of 2008, the Multilateral Fund Executive Committee had approved 17 plans on overall industrial phase-out in China, of which 3 plans had been completed and 14 were still under way. In 2008, China achieved remarkable results in implementing Montreal Protocol. Industrial plans were carried out steadily and USD48.077 million was approved by the Multilateral Fund for these plans including USD13.5 million for the newly approved methylenediphenyl diisocyanate (MDI) industrial plan and USD4.1 million for preparation of 9 projects relating to HCFC phase-out.

**Convention on Biological Diversity** The draft work on the fourth national report on China's implementation of Convention on Biological Diversity was completed, providing guarantee for evaluating the progress towards 2010 objectives. MEP, NDRC, EU and UNDP jointly hosted the first China International Workshop on Biodiversity and Climate Change in Beijing. The meeting reached consensus on five proposals, including developing national scheme on biodiversity conservation, strengthening technical support for and international cooperation in biodiversity conservation to combat climate change, promoting widespread public participation and so on. The consensus would become a key instrument for guiding national work on conserving biodiversity and addressing climate change in the future.

**Stockholm Convention on Persistent Organic Pollutants** The year 2008 marked the full implementation of China's national implementation plan for Stockholm Convention. A series of important work was carried out such as establishing an expert committee of the coordination group, studying and formulating POPs related policies, technical standards and guidelines, completing the investigation of inventory on POPs and carrying out pesticide phase-out and replacement, management and disposal of PCBs, dioxin reduction, investigation and management of waste and contaminated sites through seeking financial support from donations. Substantial progress was made in such hot issues as performance evaluation on convention implementation, POPs to be added to the control list, compliance mechanism and financial mechanism. The construction of information system for POPs management was basically completed, which provided a platform for effective management of POPs reduction in the future.

On Nov. 11, 2008, the convention implementation office held an international review meeting on China's implementation of Stockholm Convention on Persistent Organic Pollutants.





## Grassland

### General Situation

There were 400 million ha grassland across China, accounting for 41.7% of total land area. Grassland in Tibet, Inner Mongolia, Xinjiang, Qinghai, Sichuan, Gansu, Ningxia, Shaanxi, Guizhou, Yunnan, Guangxi and Chongqing (twelve provinces, autonomous regions and municipality) totaled 330 million ha, taking up 84.4% of the total. Grassland in Liaoning, Jilin and Heilongjiang covered 17 million ha, or 4.3% of the total, whereas grassland in other regions were 45 million ha, accounting for 11.3% of the total.

**Grassland Productivity** The productivity of grassland vegetation in 2008 was close to that of 2007. Total output of fresh grass in natural grassland was 947.16 million tons, equal to 296.27 million tons of dry grass. The output was similar to the previous year and the livestock carrying capacity was able to feed 23,178 sheep.

**Grassland Disasters** A total of 251 grassland fires occurred in China in 2008, affecting 9,895.9 ha, down by 13.0% against that of 2007. 36.76 million ha of grassland was damaged by rat plague, accounting for 9.4% of the total, down by 5.6% compared with the same period of 2007. Insect pests threatened 27 million ha, or 6.9% of the total, up by 53.6% compared with that of 2007.

### Measures and Actions

**[ Major Program for Protection and Development of Grassland ]** In 2008, the Central Government allocated 1.5 billion Yuan for grazing withdrawal and grassland management in Inner Mongolia, Sichuan, Gansu, Ningxia, Qinghai, Tibet, Xinjiang, Yunnan, Guizhou and Xinjiang Production & Construction Corps. 5.23 million ha of grassland was fenced, 27,000 ha stony desert was put under control and additional seeding was made on 1.57 million ha that was seriously degraded. Grassland treatment and sand source control projects were implemented in Beijing, Inner Mongolia, Shanxi and Hebei with a total investment of 390 million Yuan. The projects resulted in treatment of 236,000 ha grassland, 1.21 million m<sup>2</sup> livestock shed and 25,540 sets of fodder processors.

These projects helped to improve grassland vegetation coverage, growth and turnout of fresh grass, leading to dramatic improvement in eco environment and infrastructure and effectively transforming the production mode of grassland husbandry.

### Chemical Management

China is a big player in chemical production, consumption and world trade. Up to now, 45,000 kinds of chemical substance are being produced, imported and sold. About 100 more new substances are notified and distributed every year. In 2008, MEP issued 185 licenses for imported toxic chemicals, 3,911 import clearance notifications and 4,478 export clearance notifications, involving 46 chemical substances and 512 domestic and foreign institutions. In 2008, 634,200 tons of imported toxic chemicals were canceled after verification, down 16.5% from the previous year, and 97,600 tons of exports were ruled out, shrinking by 36.1%. The total amount of imports and export was on a declining trend. MEP also conducted examinations and blind test on 11 laboratories from 7 provinces which applied for test data provision of new chemical substances. The authority also published 7 testing agencies on new chemical ecotoxicology that had passed the examination.

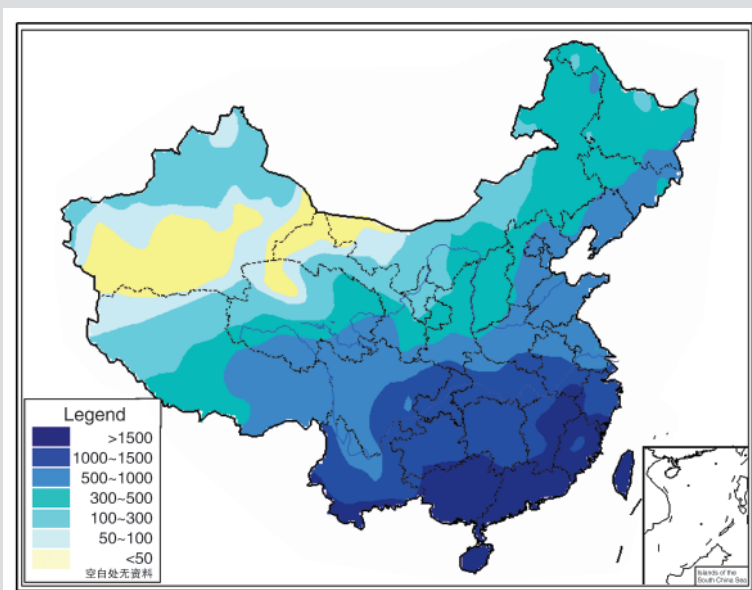


## Climate and Natural Disaster

### Climate Conditions

The climate of China in 2008 was characterized by chilly winter, warm spring and autumn and rainy summer. The annual average temperature made 2008 the 7<sup>th</sup> warm year since 1951, also the 12<sup>th</sup> consecutive year with higher-than-normal temperature in history. Average rainfall in the year was more than historical average, making it the rainiest year in decade. But there was big change in different time period throughout the year. On the whole, the country suffered less from drought, rainstorm and water logging despite the severe loss caused by the unprecedented cold and snowstorm in South China in early 2008. Light and heat conditions were favorable for crop growth and the climate was more agreeable than normal years.

**Precipitation Distribution** The average precipitation in 2008 recorded 651.3mm, 38.4mm more than that of normal years, making it the year with the highest precipitation in a decade. Special distribution of rainfall was not even. Most of the southern area to the Yellow River, the eastern part of North China and southwest of North China had average rainfall above 500mm, whereas rainfall was less than normal years in the west and northeast part of Northwest China, southwest of North China, the northern part of Northeast China and part of the eastern area to the south of the lower reaches of the Yangtze River. Precipitation in part of Xinjiang and west Gansu was less than normal years by 20%-50%, and western Inner Mongolia, western Qinghai, the central part of Tibet, the middle-to-southern part of Guangxi and southwest Guangdong saw more rainfall up to 20%-50%. Part of these areas even had 50% more precipitation than historical average.

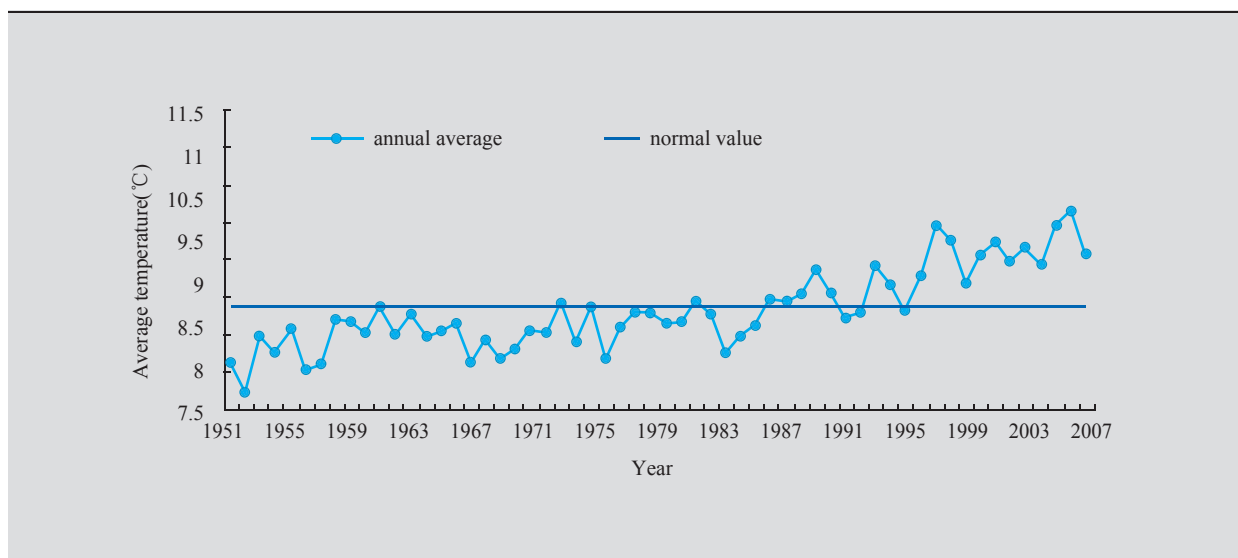


Distribution of precipitation in 2008 (mm)



**Temperature Distribution** The average temperature of 2008 was 9.6°C, 0.7°C higher than normal years. It was the 7<sup>th</sup> warmest year since 1951, also the 12<sup>th</sup> consecutive year with higher-than-normal temperature. Temperature in most of China was higher than normal level or close to normal years; among them the central-to-northern part of Northeast China, eastern

Inner Mongolia, northern and southern Xinjiang had warmer weather with 1-2°C higher than that of the past years. Except Guangxi with temperature lower than historical average and Guangdong and Hainan which reported normal temperature value, the rest of China all saw higher temperature with that of Heilongjiang Province hitting second highest in the history.



Average temperature in historical years (°C)

## Natural Disasters

**Climate Disaster** In spite of the heavy loss caused by the rare cold and snowstorm hitting South China in early 2008, the country suffered less from drought, rainstorm and water logging. The climate was more pleasant than that of normal years. Direct economic losses due to climate disaster ran to over 310 billion Yuan in 2008, higher than the historical average since 1991. Among them, the cold and snowstorm led to a loss of 151 billion Yuan, nearly half of the total loss from climate disaster in 2008. Over 1700 lives were claimed by disasters, a sharp drop compared with the average of the last decade. As far as the area of affected cropland was concerned, cold and snowstorm and drought were the major culprits of 2008 climate events, which resulted in damage of 39% and 30% of the total affected cropland respectively. Damage caused by cold and snowstorm was much heavier than that of 2007.

—**Cold and Snowstorm** In 2008, about 15 million ha farmland was impacted by cold and snowstorm, leading to

direct economic loss of over 159 billion Yuan. In particular, the cold and snowstorm in South China in early 2008 was most disastrous in 50 years in terms of economic loss and affected population, making it the top meteorological disaster in 2008.

From January 10 to February 2, 2008, most of China, especially in the southern part, experienced four strokes of cold and snowstorm with dramatic temperature drop, exceptionally heavy snowfall and long duration. The disaster affected nearly two thirds of the provinces, autonomous regions and municipalities except the southern part of South China, Northeast China, and the middle-to-southern part of Yunnan Province. It brought about serious impact on transportation, electric power transmission, communications, agriculture and people's daily life, and over 11 million ha farmland and 100 million people suffered from it. Direct economic losses exceeded 150 billion Yuan. The power operation systems were completely shattered.

—**Rainstorm and Water Logging** In early summer of 2008, the Pearl River Basin and the upper reaches of Xiangjiang River were hit hard by strong floods and in midsummer, torrential rainfall washed the upper and middle

reaches of the Yangtze River and Huaihe River Basin, giving rise to disaster in part of the region. South China experienced the heaviest ever rainfall since 1951 in autumn and some areas suffered from water logging, landslide and mudslide. In September, the quake-hit areas of Sichuan were afflicted by downpour, landslide and mudslide. To sum up, there were no widespread serious storm and flood disasters in China in 2008, but part of the country was frequented by these nuisances, mountain torrents in particular. Compared with the disasters struck in the past decade, the storm and water logging in 2008 caused less economic losses and fewer deaths.

—**Drought** Northeast China and North China were affected by continued serious drought from winter to spring in 2008, and Northwest and North China suffered from drought in certain periods in the summer. On the whole, apart from phased drought in some of North China and severe drought in certain areas, most of the country did not see continued serious drought on a large scale. Only a small proportion was affected by drought with minor damages.

—**Dust and Sandstorm** In the spring of 2008, North China had 1.7 dusty days, 3.8 days fewer compared to historical average (5.5 days). The number of days with dust weather ranked the second least since 1961, 1.4 days more than that of the same period of 2005. North China had 9 dust weather processes in the spring, much fewer than that of the same period of past years (the average between 2000 and 2007 was 13.8), which included 1 severe sandstorm, 6 sandstorms and 2 flying dust processes. Compared with last spring, both the occurrence and severity of dust storm were reduced.

—**Tropical Cyclone and Lightning Strike** 10 tropical cyclones landed China in 2008 (maximum wind force near the center  $\geq 8$ ), three more than that of normal years. Records were set in early landing and its high frequency, and the cyclones were intense (six of them were up to the intensity of typhoons), concentrating in a short period of time but affecting a small part of region (mostly the coastal provinces, inland was rarely affected). These climate events caused over 170 deaths (including those missing) and direct economic loss of more than 32 billion Yuan. The damage was less than the average of the past decade and cases of death were also fewer than historical average level. Part of the country, such as Hubei, Gansu, Hebei and Hunan, were met with frequent severe convective weather, which claimed 56 lives. Casualties from lightening strike were sharply reduced compared to the previous year.

**Earthquake** China was hit by 99 earthquakes above magnitude 5 on the Richter scale which included one above 8-magnitude, one between 7.0 and 7.9, 19 6.0-6.9 magnitude quakes and 78 measured at 5.0-5.9 magnitude. 87 quakes struck on the mainland and 12 took place in sea areas and

Taiwan region. In the Wenchuan earthquake sequence, there were one quake above magnitude 8.0, 8 between magnitude 6.0 and 6.9 and 34 on the scale of 5.0-5.9, accounting for half of the total quakes above magnitude 5.0 taking place on the mainland.

Mainland China had 17 quake-related disasters. The magnitude 8 Wenchuan earthquake registered the most devastating quake disaster in 30 years, and also the most catastrophic natural disaster in the past 10 years. With the intensity up to XI, the tremor was extremely destructive and felt by all corners of the country, even in South Asia and Southeast Asia. Sichuan, Gansu, Shanxi, Chongqing, Yunnan and Ningxia were affected to different extent, involving 244 counties (prefectures and districts) and 5,176 towns with 440,400 sq. km. The disaster impacted 104.88 million people, including nearly 70,000 deaths, 370,000 injured, 20,000 lost and 33.62 million affected. Direct economic losses totaled 852.3 billion Yuan.

The other 16 quake-related disasters killed 56 people, injured 1,227 and affected 2.44 million people. Affected area and direct economic losses amounted to 60,841 sq. km. and 7.19 billion Yuan respectively.

**Geological Disaster** There were 27,000 cases of geological disasters in 2008 with 1,598 casualties. Among them 656 people were killed and 101 missing. The disasters inflicted direct economic loss worth of 3.27 billion Yuan. Successful attempts helped to evade 478 geological disasters, transferring 21,000 people and saving direct economic losses of 320 million Yuan.

**Oceanic Disaster** The year 2008 witnessed 134 cases of storm tide, ocean waves, sea ice, red tide and other oceanic disaster. No tsunami happened. These disasters resulted in direct economic losses of 20.61 billion Yuan and killed 152 people (including those missing). Among them, there were 25 storm tides, leading to 19.22 billion Yuan direct economic losses and 56 deaths (including those missing); 33 cases of ocean wave with 55 million Yuan direct economic loss and 96 deaths (including those missing). The consequence of sea ice was milder than that of previous years, which caused direct economic loss of 2 million Yuan. There were 68 occurrences of red tide, leading to 2 million Yuan direct economic losses and 8 cases of saline water intrusion.

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## Measures and Actions

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**[ Strengthening Emergency Response to Meteorological Disasters and Multi-Department**



**Actions ]** Related ministries under the State Council launched joint actions for emergency response to cope with meteorological disasters. China Meteorological Administration (CMA) teamed up with transportation, water resources and agricultural departments to fully play its role of serving transport, flood and drought control and agricultural production. The authority put forward timely suggestions for invoking the contingency plan and got prepared for information collection, coordination and handling in a state of emergency. CMA declared 15 alerts for emergencies with a total duration of 113 days, involving 15 provinces nationwide. With energetic effort of the meteorological departments and local governments, casualties and economic loss caused by cold and frost, snowstorm, typhoon, rainstorm and lightning were effectively reduced.

**[ Revision of Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters ]** On Dec. 27, 2008, the 6th session of the 11th Standing Committee of the National People's Congress reviewed and adopted the revised Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters. The new version added 45 articles and made amendment to 40 plus articles, fully drawing upon the experience of Wenchuan earthquake relief and improving contents on earthquake mitigation plan, seismic monitoring and forecast, emergency response and assistance and post-

quake reconstruction.

**[ Development of Earthquake Monitoring Network and Technical System for Emergency Command ]** The completion of China digital earthquake observation network brought the number of stations linked to national seismic system from 48 to 150 and the number of regional stations from 21 to 31. The average monitoring capacity of 90% areas on the mainland was raised from monitoring magnitude 4.5 quake to magnitude 3.0. In most key earthquake monitoring and defense areas, densely populated cities and coastal regions in the east, the monitoring capacity has reached magnitude 2.0. Rapid earthquake warning within the network was shortened to 12 minutes. The country has established a set of technical system for earthquake emergency command for the State Council Earthquake Relief Headquarters, 15 technical command systems in Grade I region, 16 for Grade II region, 21 sets of mobile technical command systems for on-site emergency response, 60 emergency decision-making and response systems for key cities and 30 regional emergency material storages. Thus, an integral, multi-layer and mutually supporting seismic technical command system for emergency response has taken shape.

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Note: Except administrative zoning, national land territory and earthquake disasters, national statistics shown in the report do not include those of Taiwan Province, Hong Kong Special Administrative Region and Macao Special Administrative Region.

## Participating Agencies for Compilation of 2008 Report

### Leading Agency

Ministry of Environmental Protection

### Contributing Agencies

National Development and Reform Commission

The Ministry of Land and Resources

The Ministry of Housing and Urban–Rural Development

The Ministry of Water Resources

The Ministry of Agriculture

The Ministry of Health

National Bureau of Statistics

State Forestry Administration

China Meteorological Administration

China Seismological Bureau

State Oceanic Administration