

The “2009 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 fourth plenary session of the 17<sup>th</sup> National Congress of CPC on September 18, 2009 that we shall pay more attention to energy conservation and environmental protection.

Photo by Fan Rujun, Xinhua News Agency




At the Second Meeting of the 11<sup>th</sup> NPC held on March 5, 2009, Premier Wen Jiabao said in the Report of the Government that we shall make unswerving effort to strengthen energy conservation, major pollutant emission reduction and protection of eco environment.

Photo by Liu Jiansheng, Xinhua News Agency



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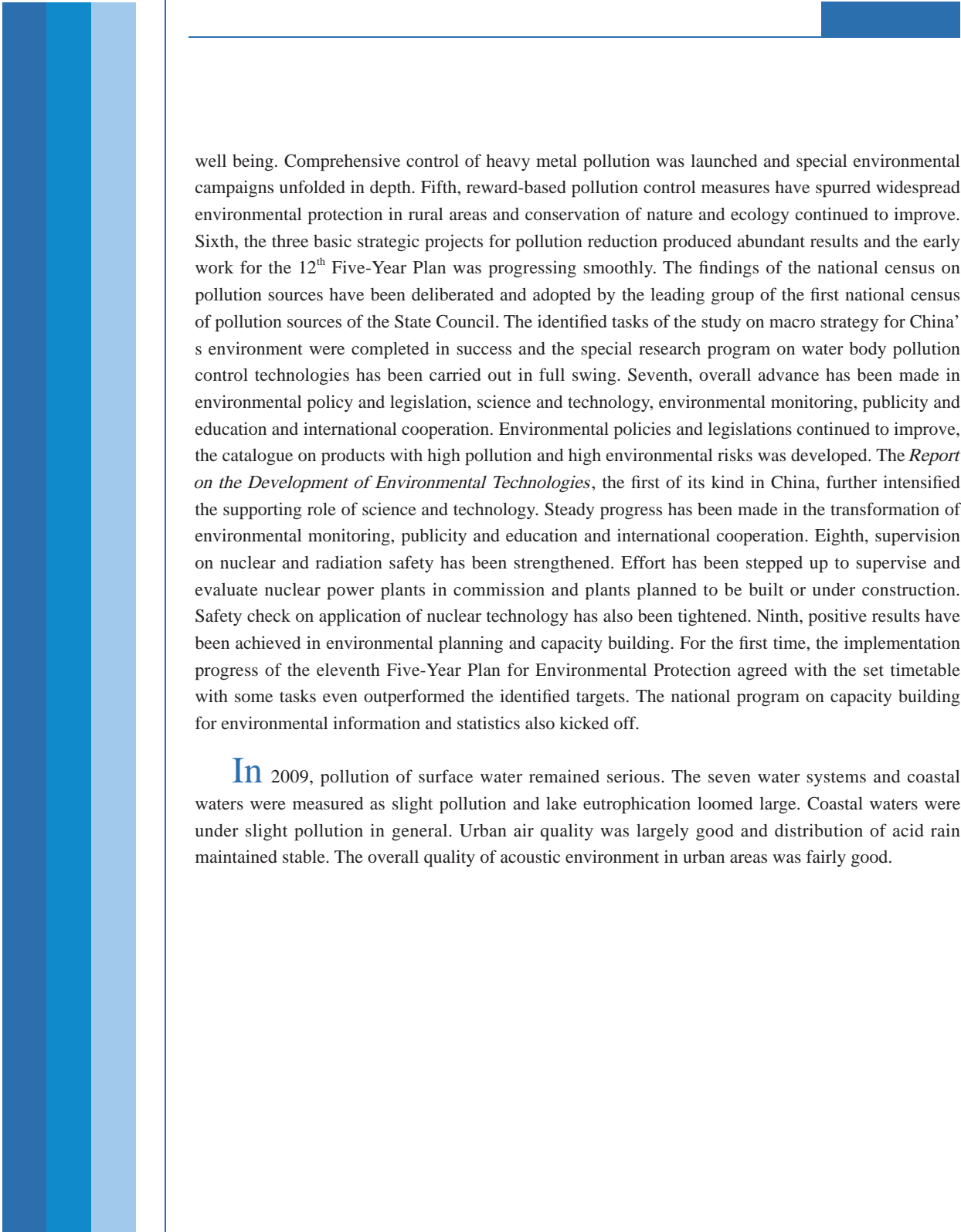


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The year 2009 marked the most difficult time for China's economic development since the 21 century and also a year when the CPC Central Committee and the State Council led all peoples to forge ahead courageously and stood severe tests. In the face of the impact of global financial crisis, the CPC Central Committee and the State Council remained calm and resolute by taking account of overall considerations. The stimulus package, which has been put into effect and constantly enriched and improved, has effectively curbed the downward trend of economic growth and led the economy to recovery. While combating the financial crisis, the central leadership has never neglected environmental protection. Rather, environmental protection was required to be taken as an important tool to deal with the crisis. The environmental protection system has firmly implemented the arrangements by the CPC Central Committee and the State Council on environmental protection. It kept on focusing on the theme of exploring a new path to environmental protection and the main route of environmental work against the backdrop of international financial crisis. Working hard on the key task of solving notorious environmental problems threatening public health, the system has further improved its capacity for macro regulation and control and achieved remarkable results in pollution reduction. With steady progress in pollution prevention and control and positive development in infrastructure building, various tasks of 2009 were well performed.

First, environmental protection work became more proactive and effective in macro economic regulation and control and made great contribution to the goal of maintaining economic growth and adjusting economic structure. As required by the central government, the environmental system took the combat against financial crisis as a good opportunity to transform the pattern of economic development, restructure the economy and develop environmental cause. It went all out to serve the overall situation and paid great attention to maintain the results already achieved. To prevent rebound of pollution, it exercised strict control over energy and resource-intensive and high pollution projects, overcapacity and redundant projects. Second, pollution reduction has achieved notable result and some indexes for environmental quality continued to improve. COD discharge and SO<sub>2</sub> emission went down by 3.27% and 4.60% respectively compared with that of the last year and down by 9.66% and 13.14% against 2005 level. The target of SO<sub>2</sub> reduction set in the eleventh Five-Year Plan was accomplished a year ahead of schedule, laying a solid foundation for the overall success of emission reduction for the eleventh Five-Year Plan. Third, the idea of rehabilitation of rivers and lakes was put into practice and new breakthrough was made in pollution control in key river basins and regions. *Provisional Measures for Assessing Implementation of Special Plans for Water Pollution Prevention and Control in Key River Basins* has been relayed by the General Office of the State Council, indicating the full establishment of water quality assessment system for provincial sections at key river basins. This will be a crucial instrument for promoting water pollution prevention and control in key river basins. Fourth, more efforts were made to promote environmental law enforcement and emergency management and priority was given to prominent environmental issues like heavy metal pollution that concern public

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well being. Comprehensive control of heavy metal pollution was launched and special environmental campaigns unfolded in depth. Fifth, reward-based pollution control measures have spurred widespread environmental protection in rural areas and conservation of nature and ecology continued to improve. Sixth, the three basic strategic projects for pollution reduction produced abundant results and the early work for the 12<sup>th</sup> Five-Year Plan was progressing smoothly. The findings of the national census on pollution sources have been deliberated and adopted by the leading group of the first national census of pollution sources of the State Council. The identified tasks of the study on macro strategy for China's environment were completed in success and the special research program on water body pollution control technologies has been carried out in full swing. Seventh, overall advance has been made in environmental policy and legislation, science and technology, environmental monitoring, publicity and education and international cooperation. Environmental policies and legislations continued to improve, the catalogue on products with high pollution and high environmental risks was developed. The *Report on the Development of Environmental Technologies*, the first of its kind in China, further intensified the supporting role of science and technology. Steady progress has been made in the transformation of environmental monitoring, publicity and education and international cooperation. Eighth, supervision on nuclear and radiation safety has been strengthened. Effort has been stepped up to supervise and evaluate nuclear power plants in commission and plants planned to be built or under construction. Safety check on application of nuclear technology has also been tightened. Ninth, positive results have been achieved in environmental planning and capacity building. For the first time, the implementation progress of the eleventh Five-Year Plan for Environmental Protection agreed with the set timetable with some tasks even outperformed the identified targets. The national program on capacity building for environmental information and statistics also kicked off.

**In** 2009, pollution of surface water remained serious. The seven water systems and coastal waters were measured as slight pollution and lake eutrophication loomed large. Coastal waters were under slight pollution in general. Urban air quality was largely good and distribution of acid rain maintained stable. The overall quality of acoustic environment in urban areas was fairly good.



# Reduction of Total Discharge of Major Pollutants

## Basic Objectives

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. By 2010, discharges of COD and SO<sub>2</sub>, the two binding targets for pollution reduction, have dropped by 10% respectively on the level of 2005, meaning that COD discharge was reduced to 12.728 million t from 14.142 million t in 2005 and SO<sub>2</sub> emissions reduced to 22.944 million t from 25.494 million t.

The targets for pollution reduction in 2009 were as follows: COD discharge and SO<sub>2</sub> emission reducing by 3% and 2% respectively compared with that of the last year, or down by 8% and 9% respectively based on 2005 level; newly added reductions of COD and SO<sub>2</sub> totaling 1.12 million t and 1.9 million t respectively; ensuring added capacity of urban sewage treatment of 10 million t/d, newly installed capacity of coal-fired units above 50 GW and 20 more sets of sintering machines for fume desulphurization. Meanwhile, intensified effort was needed to ensure stable operation of over 300 GW thermal power desulphurization units and 1300 sewage treatment plants that have been put into operation and ensure networking of online monitoring systems for over 6000 key national pollution sources linked to national or provincial networks. Engineering programs should lead to reduction of 750,000 t COD and 1.4 million t SO<sub>2</sub>. Elimination of outdated production capacity included 10 million t in iron smelting, 6 million t in steelmaking, 500,000 t for papermaking and 15 GW in the power sector, which would lead to additional reduction of COD and SO<sub>2</sub> by 370,000 t and 500,000 t respectively.

## Reduction of Major Pollutants

In 2009, total COD discharge in China reached 12.775

million t, down by 3.27% against that of 2008 and that of SO<sub>2</sub> stood at 22.144 million t, down by 4.60%, continuing the momentum of declining discharges of both pollutants. Compared with 2005 level, total discharge of COD and SO<sub>2</sub> fell by 9.66% and 13.14% respectively. The progress of SO<sub>2</sub> reduction has overtaken the set target in the 11<sup>th</sup> Five-Year Plan.

## Major Measures

In 2009, the State Council held the third meeting of the leading group of energy conservation and emission reduction and the General Office of the State Council issued arrangements for the work. The evaluation results of pollution reduction in all provinces (autonomous regions and municipalities), State Grid Corporation and the five major power group corporations in the first half year were released together with report on indicators of major pollutants of all provinces (autonomous regions and municipalities) in the first half of 2009. Localities and companies with serious problems were made public, subject to rectification within a set time limit or economic penalties. The central government issued written alerts to 8 provinces (autonomous regions) which made slow progress in pollution reduction and talked with the top leaders of local governments for supervision and guidance. The strict assessment and accountability system evoked resounding response, triggering successive measures that were creative and strong across the country. For instance, Hebei Province unveiled *Regulation on Reduction of Pollution Discharges* and Henan Province issued *Regulation on Water Pollution Prevention and Control*. *Measures on Administrative Accountability for Reduction of Total Discharge of Major Pollutants* was developed in Guizhou Province where government leaders at prefecture and county level were warned due to sluggish progress in the construction of sewage treatment facilities. Guangxi Autonomous Region issued notifications to 47 city (prefecture) leaders who failed

to ensure on-time delivery of sewage treatment facilities. Jiangsu and Zhejiang Province have set out to prepare plans for construction of sewage treatment facilities at township level. "One sewage treatment facility for each county" has been widely promoted in provinces including Liaoning, Jiangxi and Hubei. And in Gansu, Xinjiang and Qinghai, local governments managed to channel funds to support key pollution control projects despite financial difficulties, which has effectively promoted in-depth implementation of pollution reduction.

In 2009, the three major measures to reduce pollution through projects, economic restructuring and environmental management have brought about benefits. First, by developing various pollution control projects, the country saw increased sewage treatment capacity by 13.3 million t/d in urban areas, exceeding the target of 10 million t identified in early 2009. 102 GW of newly installed capacity for coal-fired desulphurization units surpassed the set target of 50 GW in the beginning of the year. In addition, a group of projects have been delivered including advanced treatment of wastewater,

sintering machine for flu gas desulphurization. These projects helped to reduce another 1.166 million t COD and 1.734 t SO<sub>2</sub>. Second, by fostering large power projects and restricting small ones, 26.17 GW installed small thermal power units were shut down. The country also phased out outdated production capacity in iron & steel, coking and cement sectors by 21.13 million t, 16.91 million t, 18.09 million t and 74.16 million t respectively and wound up over 1200 companies in papermaking, chemical, alcohol, monosodium glutamate and brewery sectors. These efforts have contributed to reduction of COD by 263,000 t and SO<sub>2</sub> by 842,000 t. Third, since 2007, the country has allocated 6.06 billion yuan to support the three systems for pollution reduction, leading to establishment of 306 monitoring centers on pollution sources and online monitoring of 13,000 key enterprises. The national program on capacity building for environmental information and statistics was also launched. In 2009, 78% of wastewater and 73% of waste air from the key national pollution sources met national environmental standard, up by 12 and 13 percentage points respectively compared with that of the last year.

## Response to Climate Change in China

Premier Wen Jiabao delivered an important speech entitled *Build Consensus and Strengthen Cooperation to Advance the Historical Process of Combating Climate Change* at Copenhagen Climate Change Summit on December 18, 2009. In his speech, he noted that climate change is a major global challenge. It is the common mission of the entire mankind to curb global warming and save our planet. It is incumbent upon all of us, each and every country, nation, enterprise and individual to act, and act now in response to this challenge.

China has taken climate change very seriously in the course of its development. Bearing in mind the fundamental interests of the Chinese people and mankind's long-term development, we have exerted unremitting effort and contributed to the fight against climate change. China was the first developing country to adopt and implement a National Climate Change Program. We have formulated or revised the Energy Conservation Law, Renewable Energy Law, Circular Economy Promotion Law, Clean Production Promotion Law, Forest Law, Grassland Law and Regulations on Civil Building Efficiency. Laws and regulations have been an important means for us to address climate change. China has made the most intensive efforts in energy conservation and pollution reduction in recent years. We have improved the taxation system and advanced the pricing reform of resource products with a view to putting in place at an early date a pricing mechanism that is responsive to market supply and demand, resource scarcity level and the cost of environmental damage. We have introduced 10 major energy conservation projects and launched an energy conservation campaign involving 1,000 enterprises, bringing energy-saving action to industry, transportation, construction and other key sectors. We have implemented pilot projects on circular economy, promoted energy-saving and environment-friendly vehicles and supported the use of energy-saving products by ordinary households with government subsidies. We have worked hard to phase out backward production facilities that are energy intensive and heavily polluting. China has enjoyed the fastest growth of new energy and renewable energy. On the basis of protecting the eco-environment, we have developed hydro power in an orderly way, actively developed nuclear power, and encouraged and supported the development of renewable energy including biomass, solar and geothermal energy and wind power in the countryside, remote areas and other places with the proper conditions. China has the largest area of man-made forests in the world. We have continued with the large-scale endeavor to return farmland to forest and expand afforestation, and made vigorous effort to increase forest carbon sink.

Premier Wen Jiabao made solemn commitments at the Summit: it is with a sense of responsibility to the Chinese people and the whole mankind that the Chinese government has set the target for mitigating greenhouse gas emissions. This is a voluntary action China has taken in light of its national circumstances. We have not attached any condition to the target, nor have we linked it to the target of any other country.

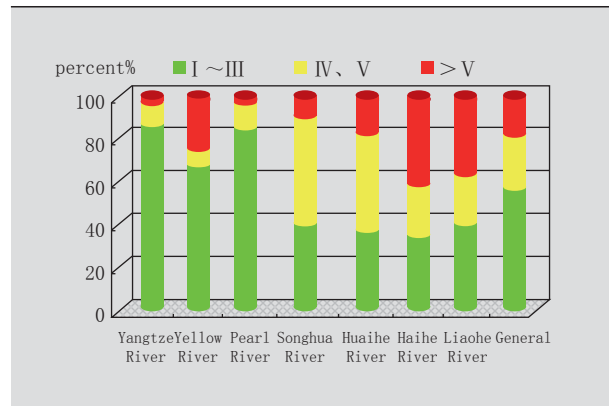
## Water Environment

### General Situation

Pollution of surface water in China remained serious. In general, the seven major water systems were under slight pollution and rivers in Zhejiang Province and Fujian Province were slightly polluted. Rivers in northwest China recorded slight pollution whereas those in the Southwest enjoyed good water quality. Eutrophication in lakes (reservoirs) was prominent.

#### Rivers

The seven big rivers (the Yangtze River, Yellow River, Pearl River, Songhua River, Huaihe River, Haihe River and Liaohe River) were under slight pollution in general. Among the 408 sections of 203 rivers under national monitoring, sections with water quality ranged from Grade I to III, Grade IV to V, and inferior to Grade V accounted for 57.3%, 24.3% and 18.4% respectively. Major pollutants included permanganate value, BOD<sub>5</sub> and NH<sub>3</sub>-N. Of the big rivers, the Pearl River and the Yangtze River enjoyed good



Water quality grade of seven big rivers in China

water quality and Songhua River and Huaihe River were measured as slight pollution, the Yellow River and Liaohe River intermediate pollution and Haihe River heavy pollution.

**The Yangtze River Waters** The overall water quality of the Yangtze River was good. Among 103 surface water sections under national monitoring program, 87.4% met Grade I ~ III national water quality standard, 5.8% met Grade



Water quality of the Yangtze River Waters

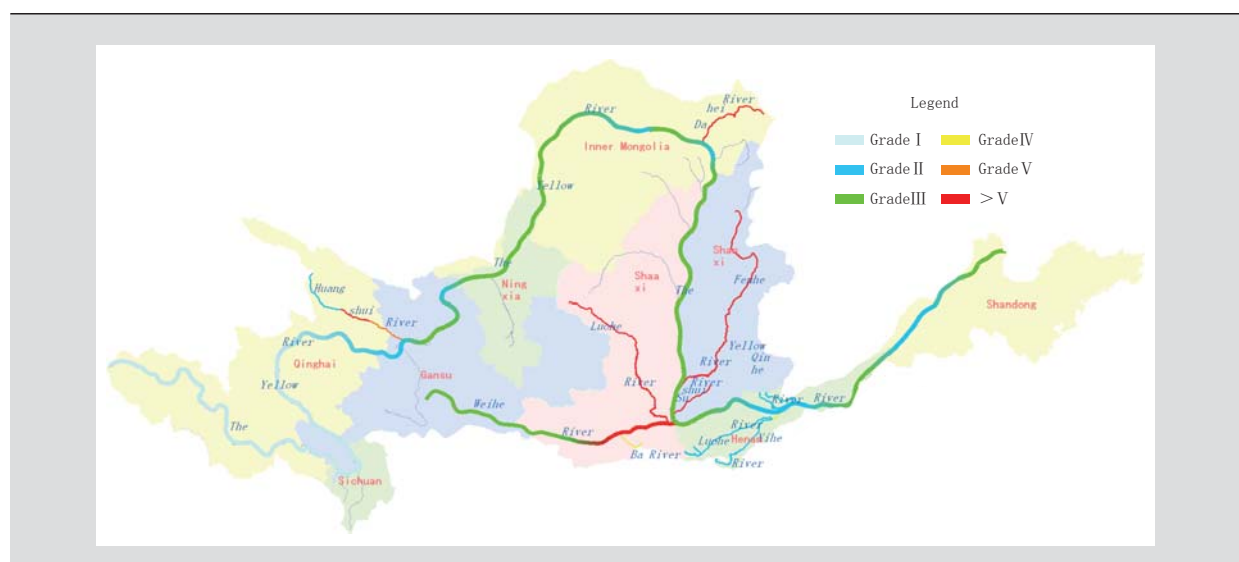
IV standard, 2.9% met Grade V standard and 3.9% failed to meet Grade V standard. Major pollutants included ammonia nitrogen, BOD<sub>5</sub> and petroleum.

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 the last year. In the ten biggest tributaries of the Yangtze River, Yalong River, Jialing River, Wujiang River, Yuanjiang River and Hanjiang River enjoyed excellent quality. Dadu River, Minjiang River, Tuojiang River, Xiangjiang River and Ganjiang River had good quality. However, Nanchang section

of Ganjiang River was under slight pollution. Major pollutants included ammonia nitrogen.

Water quality of trans-province river sections was excellent. Among 20 sections, 90.0% met Grade I ~ III national water quality standard, 5.0% met Grade IV standard and 5.0% failed to meet Grade V standard, with no obvious change compared with that of the last year. 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. Water quality failed to meet Grade V standard. Major pollutants included ammonia nitrogen, BOD<sub>5</sub> and permanganate value.



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 I ~ III quality standard, 4.5% met Grade IV standard, 2.3% met Grade V standard and 25.0% failed to meet Grade V standard. Major pollutants included petroleum, ammonia nitrogen 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 the last year.

In general, the tributaries of the Yellow River were under heavy pollution, showing deteriorating quality compared with that of the last year. Major pollutants included petroleum, ammonia nitrogen and BOD<sub>5</sub>. All tributaries were subject to heavy pollution except Yihe River, Luohe River and Qinhe River which enjoyed excellent quality and the Yiluo River

which was under slight pollution. Heavy pollution was found in Xi'an section and Weinan section of the lower reaches of Weihe River, Xining section of Huangshui River, Taiyuan section, Linfen section and Yuncheng section of the Fenhe River, Weinan section of northern Luohe River, Hohhot section of Dahei River and Yuncheng section of the Sushui River.

The trans-province river sections were under intermediate pollution. Among 11 sections, 63.6% met Grade I ~ III national water quality standard, 9.1% met Grade V standard and 27.3% failed to meet Grade V standard. Major pollutants included ammonia nitrogen, BOD<sub>5</sub> and permanganate value. Tongguan Diaoqiao 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.





**The Haihe River Waters** In general, the Haihe River waters were under heavy pollution. Among the 64 sections, 34.4% met Grade I ~ III national water quality standard, 10.9% met Grade IV standard and 12.5% met Grade V standard. 42.2% failed to meet Grade V standard. Major pollutants were permanganate value, BOD<sub>5</sub> and ammonia nitrogen.

In general, the mainstream of Haihe River was under heavy pollution with no obvious change of water quality compared with that of the last year. The major pollutants included ammonia nitrogen.

The overall water quality of other rivers in Haihe River basin was under heavy pollution with major pollutants being BOD<sub>5</sub>, permanganate value and ammonia nitrogen. Water

quality improved a little compared with that of the last year. Among these rivers, Linhe River and Yongding River enjoyed excellent quality and Luanhe River had good quality. Zhangweixin River was under intermediate pollution whereas Dasha River, Ziya River, Tuhai River, the North Canal and Majia River were under heavy pollution.

Trans-province river sections were under heavy pollution. Among the 17 trans-province sections, 47.1% met Grade I ~ III national water quality standard, 11.7% met Grade V standard and 41.2% failed to meet Grade V standard. Major pollutants were ammonia nitrogen, BOD<sub>5</sub> and permanganate value. The water quality showed a little improvement as compared with that of the last year.



Water quality of the Liaohe River waters

**The Liaohe River Waters** In general, the Liaohe River waters were under intermediate pollution. Among the 36 surface water monitoring sections under national monitoring program, 41.7% met Grade I ~ III national water quality standard, 13.9% met Grade IV standard and 8.3% met Grade V standard. The rest 36.1% failed to meet Grade V standard. Major pollutants were BOD<sub>5</sub>, ammonia nitrogen and petroleum.

The mainstream of Liaohe River was under intermediate pollution. Major pollutants included BOD<sub>5</sub>, permanganate value and ammonia nitrogen. Laoha River recorded excellent water quality. Dongliao River and Xiliao River were under slight pollution. Liaohe River suffered from heavy pollution. Compared with that of the last year, water quality of Laoha River and Xiliao River experienced improvement while that of Dongliao River worsened. No evident changes were observed in Liaohe River.

In general, the tributaries of Liaohe River were under heavy pollution with no obvious changes in water quality as compared with that of the last year. Xilamulun River was under slight

pollution. Tiaozi River and Zhaosutai River were under heavy pollution. Major pollutants were permanganate value, BOD<sub>5</sub> and ammonia nitrogen.

The overall water quality of Daliao River and its tributaries were under heavy pollution. Serious pollution was found in Shenyang section of Hunhe River, Benxi section and Anshan section of Taizi River and Yingkou section of Daliao River, which was mainly attributed to petroleum, ammonia nitrogen and BOD<sub>5</sub>. No obvious change in water quality was observed compared with that of the last year.

Daling River was subject to intermediate pollution with major pollutants being petroleum, ammonia nitrogen and permanganate value. Water quality turned better as compared with that of the last year.

Among the 3 trans-province river sections, they fell under different Grades of water quality standard, namely Grade II, Grade V standard and inferior to Grade V standard respectively. The water quality of these sections worsened compared with that of the last year.



## Lakes ( Reservoirs )

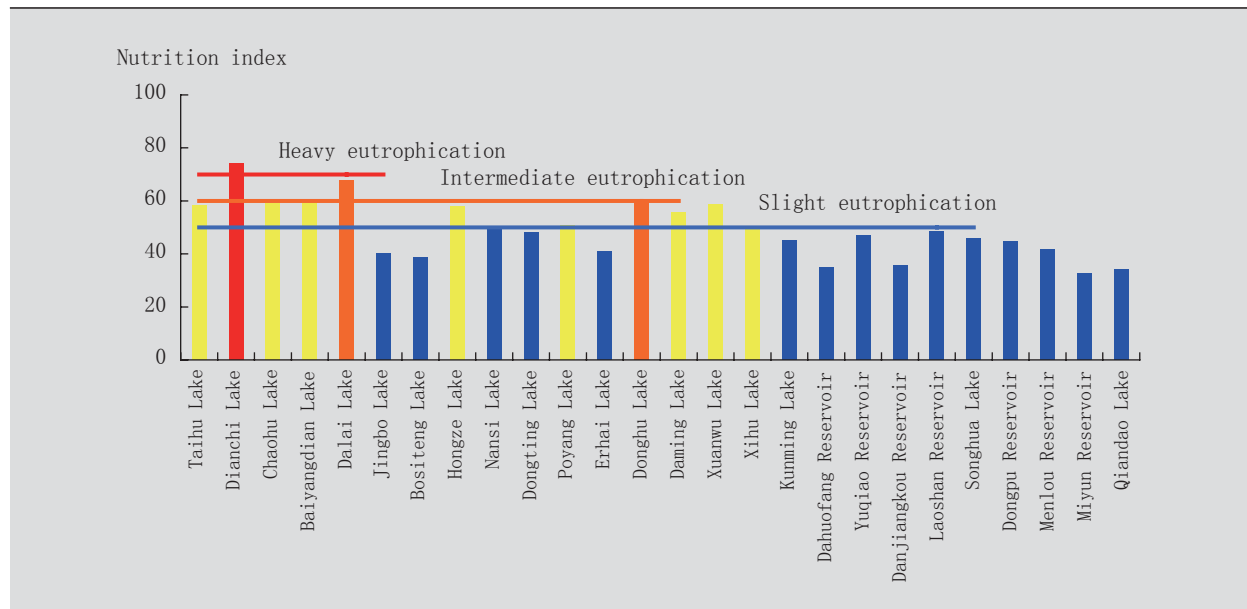
Among the 26 key lakes (reservoir) under national monitoring program, 1 met Grade II quality standard, accounting for 3.9%; 5 met Grade III standard, taking up 19.2%; 6 met Grade IV standard, accounting for 23.1%; 5 met Grade V standard, taking up 19.2%; 9 failed to meet Grade

V standard, taking up 34.6%. The main pollutants were TN and TP. Among the 26 lakes (reservoir) under eutrophication monitoring, 1 was under heavy eutrophication, taking up 3.8%; 2 were under intermediate eutrophication, taking up 7.7%; 8 were under slight eutrophication, accounting for 30.8% and the rest 57.7% posted mesotrophic level.

Water quality of major lakes ( Reservoirs )

Waters	Grade	Amount	Grade					>V	Major pollutants
			I	II	III	IV	V		
Three lakes*		3	0	0	0	0	1	2	TN, TP
Big fresh-water lake		9	0	0	3	2	1	3	
Urban lake		5	0	0	0	2	1	2	
Big reservoir		9	0	1	2	2	2	2	
Total		26	0	1	5	6	5	9	
Percent (%)			0	3.9	19.2	23.1	19.2	34.6	

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



Nutrition index of major lakes and reservoirs

**Taihu Lake** The overall water quality of Taihu Lake was worse than Grade V national water quality standard with pollutants dominated by TN and TP. The lake was subject to slight eutrophication. There was no evident change in water quality compared with that of the last year.

In general, the rivers surrounding the Taihu Lake were under slight pollution. Among the 88 monitoring sites under national water quality monitoring program, 36.3% met Grade I ~III standard, 33.0% met Grade IV standard, 11.4% and 19.3% were up to and below Grade V standard respectively. Major pollutants included ammonia nitrogen, BOD<sub>5</sub> and petroleum. Water quality turned better compared with that of the last year.

**Dianchi Lake** In general, the Dianchi Lake failed to meet Grade V standard. The main pollutants were TP and TN. There was little change in water quality as compared with that of the last year. Caohai Lake was subject to heavy eutrophication and Waihai Lake under intermediate eutrophication.

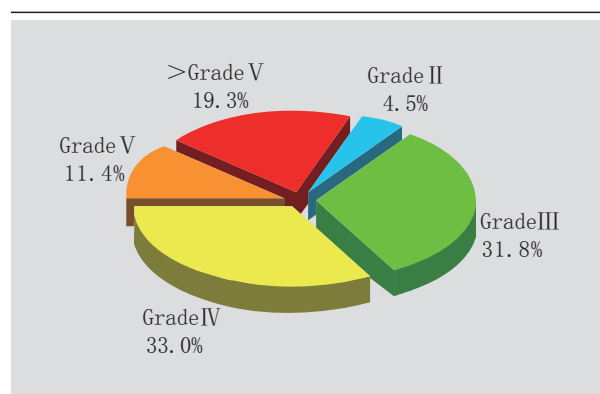
All rivers flowing into the Dianchi Lake were under heavy pollution. Among 8 sections under national monitoring program, 25.0% met Grade II standard, 12.5% met Grade IV standard and 62.5% failed to meet Grade V standard. The main pollutants were ammonia nitrogen, BOD<sub>5</sub> and petroleum. The water quality deteriorated compared with that of the last year.

**Chaohu Lake** The Chaohu Lake was up to Grade V standard with major pollutants being TP, TN and petroleum. Compared with that of the last year, water quality did not have obvious change. The western part of the lake was under intermediate eutrophication while the eastern part was under slight eutrophication.

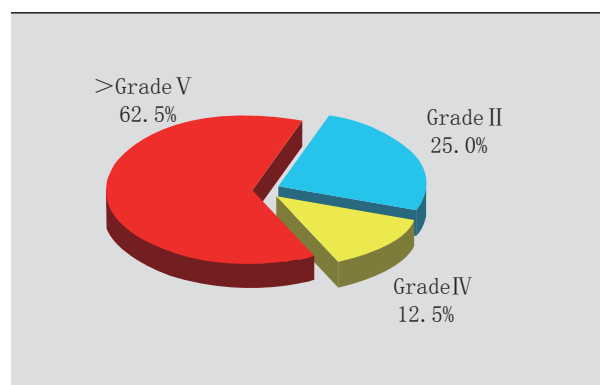
In general, all rivers flowing into the Chaohu Lake were under heavy pollution. Among the 12 surface sections under national monitoring program, 16.7% and 33.3% met Grade III and IV standard respectively, 8.3% was up to Grade V standard and 41.7% failed to meet Grade V standard. The main pollutants were petroleum, ammonia nitrogen and permanganate value.

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

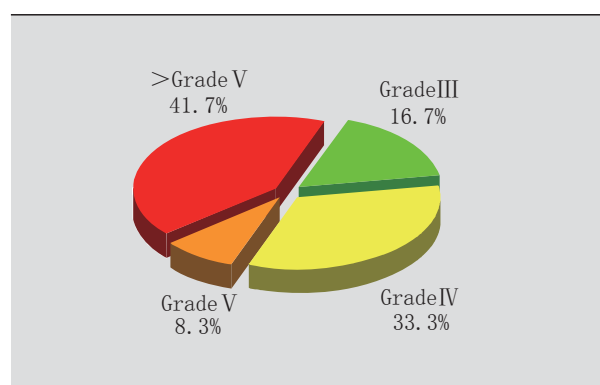
The Nansi Lake, Dongting Lake, Erhai Lake, Jingbo Lake and Bositeng Lake were under mesotrophic conditions. The Baiyangdian Lake, Hongze Lake and Poyang Lake were under slight eutrophication, while Dalai Lake was under intermediate eutrophication.



Water quality of rivers flowing into Taihu Lake



Water quality of rivers flowing into Dianchi Lake



Water quality of the rivers

Water quality of key freshwater lakes

Name	Index of nutrition	State of nutrition	Water quality	Major pollutants
Dalai Lake	67.7	IE	> V	pH, permanaganate value, TP
Baiyangdian	59.5	SE	> V	Ammonia nitrogen, TP, TN
Hongze Lake	58.0	SE	> V	TN, TP
Poyang Lake	50.6	SE	IV	TP, TN
Nansi Lake	49.6	Mesotrophic	IV	Petroleum, TP and TN
Dongting Lake	48.1	Mesotrophic	V	TP, TN
Erhai Lake	41.0	Mesotrophic	III	-
Jingbo Lake	40.2	Mesotrophic	III	-
Bositeng Lake	38.8	Mesotrophic	III	-

**Urban Lakes** Among the five urban lakes under monitoring program, Donghu Lake (Wuhan) and Kunming Lake (Beijing) met Grade IV standard; Xuanwu Lake (Nanning) met Grade V standard; Daming Lake (Jinan) and Xihu Lake (Hangzhou) failed to meet Grade V standard. Major pollutants were TN and TP. Compared with that of the last year, water

quality of Donghu Lake and Xuanwu Lake bettered and no obvious change was detected in other urban lakes.

The Kunming Lake was under mesotrophic conditions (MC), Xuanwu Lake, Daming Lake and Xihu 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
Donghu Lake	60.3	IE	IV	TP, TN
Xuanwu Lake	58.8	SE	V	TP, TN, petroleum
Daming Lake	55.7	SE	> V	TN
Xihu Lake	50.5	SE	> V	TN, petroleum
Kunming Lake	45.2	Mesotrophic	IV	TN

**Large Reservoirs** Among the nine large reservoirs under monitoring, Miyun Reservoir (Beijing) met Grade II water quality standard; Dongpu Reservoir (Anhui) and Qiandao Lake (Zhejiang) met Grade III standard; Songhua Lake (Jilin) and Danjiangkou Reservoir (Hubei and Henan) met Grade IV standard; Yuqiao Reservoir (Tianjin) and Dahuofang Reservoir (Liaoning) met Grade V standard while Laoshan Reservoir

(Shandong) and Menlou Reservoir (Shandong) failed to meet Grade V standard. The main pollutant was total nitrogen (TN). Compared with that of the last year, Qiandao Lake and Songhua Lake turned better in water quality while there was no obvious change in other 7 large reservoirs.

All the nine large reservoirs were under mesotrophic conditions.

## Water quality of large reservoirs

Name	Index of nutrition	State of nutrition	Water quality	Main pollutant
Laoshan Reservoir	48.6	Mesotrophic	> V	TN
Yuqiao Reservoir	47.1	Mesotrophic	V	TN
Songhua Lake	45.9	Mesotrophic	IV	TN, TP
Dongpu Reservoir	44.6	Mesotrophic	III	-
Menlou Reservoir	41.7	Mesotrophic	> V	TN
Danjiangkou Reservoir	35.6	Mesotrophic	IV	TN
Dahuofang reservoir	34.9	Mesotrophic	V	TN
Qiandao Lake	34.0	Mesotrophic	III	-
Miyun Reservoir	32.7	Mesotrophic	II	-

## Key Water Conservancy Projects

**The Three Gorges Reservoir** The water quality of the Three Gorges Reservoir was excellent. All the 6 sections under national monitoring program met Grade II standard.

**Waters along the eastern line of South-North Water Diversion Project** In general, the waters along the eastern line of the South-North Water Diversion Project were under slight pollution. Among the 10 monitoring sections, 40.0% and 50.0% met Grade I ~ III or Grade IV standard respectively, while 10.0% failed to meet Grade V standard. Main pollutants were petroleum, permanganate value and BOD<sub>5</sub>. The water quality did not have obvious change compared with that of the last year.

## Environmental Quality of Groundwater

Water quality monitoring of 641 wells in 8 provinces, autonomous regions and municipalities (Beijing, Liaoning, Jilin, Shanghai, Jiangsu, Hainan, Ningxia and Guangdong) revealed that 2.3% of the wells met Grade I ~ II water quality standard, which could be used for various purposes; 23.9% of wells met Grade III standard, fit for centralized drinking water sources, agricultural and industrial purposes and 73.8% fell between Grade IV and Grade V suitable for other purposes except drinking. The major pollutants were total hardness, ammonia nitrogen, nitrite nitrogen, nitrate nitrogen, iron and manganese.

In 2009, the quality of groundwater in 202 cities across the country ranged between good and poor. Deep groundwater recorded better quality than shallow groundwater in general and groundwater quality in areas subject to mild exploration

was better than those with extensive exploration. On the whole, the groundwater quality changed little compared with that of the last year and places showing a trend of degradation or amelioration scattered across the country.

## Water quality of major centralized drinking water sources in key cities

In 2009, 397 centralized drinking water sources were monitored in key cities across the country, including 244 surface water sources and 153 groundwater sources. Monitoring results indicated 15.88 billion t of water was up to standard among the total withdrawal of 21.76 billion t in key cities, accounting for 73.0%, whereas substandard water stood at 5.88 billion t, taking up 27.0%.

## Water quality of key water function zones

The monitoring and assessment program included 3219 water function zones. According to the water quality management target for water function zones, the annual up-to-standard rate of water function zones was 42.9% and that of Level I (excluding development zones) and Level II water function zones was respectively 53.2% and 36.7%.

## Environmental quality of inland fishery waters

Important fishery waters of rivers were mainly subject to

TP, nonionic ammonia, permanganate, copper and cadmium 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 were under relatively heavy nonionic ammonia pollution and certain fishery waters of the Heilongjiang River basin and the Yellow River basin were under relatively heavy permanganate pollution. Heavy copper pollution was found in some fishery waters of the Liaohe River basin, the Yellow River basin and Yangtze River basin. Compared with that of the last year, the pollution range of nonionic ammonia and cadmium shrank a little, while the pollution scope of TP, permanganate value, petroleum, volatile phenol and copper increased at different degree.

Important fishery waters of lakes and reservoirs were

mainly subject to TN, TP and permanganate pollution with TP and TN pollution remained heavy. Compared with that of the last year, pollution range of TN, TP and copper diminished a little, whereas permanganate value and petroleum generated larger areas of pollution.

### Discharge of waste water and major pollutants

In 2009, the total discharge of waste water across China was 58.92 billion t, up by 3.0% compared with that of the last year. Total COD discharge was 12.775 million t, down by 3.3% compared with that of the last year. The total discharge of ammonia nitrogen was 1.226 million t, down by 3.5% compared with that of the last year.

Total discharge of waste water and major pollutants during 2006–2009

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
2009	58.92	23.44	35.48	1277.5	439.7	837.8	122.6	27.3	95.3

## Measures and Actions

**[ Investigation and Assessment of Groundwater Pollution ]** Since 2005, the Ministry of Land and Resources has initiated investigation and assessment of groundwater pollution to gather information on China's groundwater pollution, conduct comprehensive evaluation of the degree and trend of groundwater pollution, make programs on prevention and control of groundwater pollution and conservation of groundwater resources, and establish an early warning system on groundwater quality and pollution, which provided scientific basis for prevention and control of groundwater pollution and protection of groundwater resources. By the end of 2009, the investigation and assessment had covered the Pearl River Delta, the Yangtze River Delta, the plain area of the Huaihe River Basin and North China Plain, with a total investment of 140 million yuan and research area of 430,000 km<sup>2</sup>. Pilot work was launched in some typical areas such as research on the mechanism of groundwater pollution transfer, pollution risk

assessment and prevention and control of pollution.

**[ The most stringent water resource management system ]** In early 2009, Vice Premier Hui Liangyu stressed at the National Work Meeting on Water Resources that the strictest system for water resource management should be adopted based on China's water resource situation. Ministry of Water Resources proposed to identify the bottom line for water resource development and exercise strict control on total consumption of water, centering on allocation, conservation and protection of water resources. The upper limit of pollutants carried by water function zones would also be set forth and total discharge of pollutants flowing into rivers should be strictly controlled. A limit for water use efficiency would be established to resolutely curb waste of water. Over the past year, Ministry of Water Resources has made redoubled effort on review of water withdrawal permit and water resources, promotion of water-saving society and supervision of water function zones. It has worked with 10 state departments including National Development and Reform Commission (NDRC), Ministry of Finance, Ministry of Environmental Protection and Office of Legislative Affairs to formulated *Opinions on Implementing the Most*

*Stringent System for Water Resource Management*, which has been submitted to the State Council.

**[ Assessment on implementation of special plans for water pollution prevention and control in key river basins ]** As required by the *Circular of the General Office of the State Council on Transmitting the Provisional Measures of Ministry of Environmental Protection and Other Ministries on Assessing the Implementation of Special Plans on Water Pollution Prevention and Control in Key River Basins*, Ministry of Environmental Protection joined forces with NDRC, Ministry of Supervision, Ministry of Finance, Ministry of Housing and Urban-Rural Development and Ministry of Water Resources to conduct inspection between June 25 and July 10, 2009. They formed 10 teams and inspected implementation of 2008 plan for water pollution prevention and control in 21 provinces (autonomous regions and municipalities) located in such key river basins as Haihe River Basin, Liaohe River Basin, the Three Gorges Reservoir Area and its upper reaches, upper and middle reaches of the Yellow River, Chaohu Lake Basin, Dianchi Lake Basin and Taihu Lake Basin (The preceding inspections in Huaihe River Basin and Songhua River Basin were not included in the assessment).

**[ National Inter-ministerial Meeting on Environmental Protection ]** To implement the important instruction of rehabilitating rivers and lakes put forward by Secretary General Hu Jintao, MEP and related ministries of the State Council held several important meetings including the inter-ministerial meeting on environmental protection (special meeting on water pollution prevention and control of Songhua River, Huaihe River and the upper and middle reaches of the Yellow River) and National Work Meeting on Drinking Water Source Protection & On-site Meeting on Water Pollution Control of Liaohe River Basin in Changchun, Yangzhou, Xi'an and Shenyang. MEP Minister Zhou Shengxian made important speeches, analyzing current problems with pollution control of key river basins, bringing forth different policies and measures and making arrangement for future work. Information on these meetings was reported to Secretary General Hu Jintao. Recognizing the remarkable achievement of pollution control in Songhua River and Huaihe River, Hu gave important instructions on pollution control of key river basins and required more work to be done in this regard in a bid to make positive contributions to the development of conservation culture.

**[ Prevention and control of heavy metal pollution ]** To implement the important instructions of the CPC Central Committee and the State Council leaders, MEP and seven other ministries including NDRC jointly formulated guidance on strengthening prevention and control of heavy

metal pollution. The guidance was deliberated at the 83rd executive meeting of the State Council and was issued for implementation by the General Office of the State Council in its *Circular on Transmitting the Guidance of Ministry of Environmental Protection and Other Relevant Ministries on Strengthening Prevention and Control of Heavy Metal Pollution*. The guidance identified objectives, tasks, key work areas and related policies and measures concerning heavy metal pollution, laying a solid foundation for doing a good job in the area. In 2009, MEP teamed up with nine state departments to launch special inspections on enterprises causing heavy metal pollution. The campaign involved 9123 enterprises and investigated 2183 illegal operators. 231 enterprises were closed down and 641 were forced to suspend production for rectification.

**[ Environmental remediation of manganese triangle region ]** On April 16, 2009, MEP Minister Zhou Shengxian inspected river sections and companies in the manganese region bordering Hunan, Guizhou and Chongqing. He hosted a symposium on comprehensive environmental remediation of the manganese region and made arrangement on measures for furthering the remediation. This move resulted in establishment of 19 unified remediation criteria in 6 areas. It promoted phase-out of outdated production capacity in the electrolytic manganese industry and transferred 24 cases to the economic departments on companies that were set to be shut down due to violation of industrial policies. The phased out capacity totaled 50,000 t. The campaign helped to enhance environmental supervision of electrolytic manganese industry and ordered 16 companies to go through for EIA and three simultaneities procedures. 34 companies were suspended production for rectification. The remediation involved 340 million yuan and gave a strong boost to environmental management of electrolytic manganese companies. In 2009, 160 million yuan of national environmental fund was allocated to provide financial and technical support for demonstration projects on standard storage of manganese residue, environmental disposal of chromium residue and new technology for pollution control. 17 monitoring sections of 9 rivers and 1 reservoir in the manganese triangle region were incorporated into national environmental monitoring network and the automatic water quality monitoring station of Qingjiang River was also included into national monitoring network on surface water quality.

**[ National investigation and assessment of environmental baselines for centralized drinking water source areas ]** In 2009, MEP launched a national investigation and assessment of environmental baselines for centralized drinking water source areas in towns. According

to the investigation, there are over 25,000 centralized drinking water sources at township level in China including over 700 planned water sources and backup water sources. Groundwater drinking water sources and sources along rivers accounted for 57% and 28% respectively and those along lakes and reservoirs took up 15%. These sources provide water for 22,000 towns, or 54% of the total, with a population of over 200 million, more than a quarter of the country's rural population.

In-depth investigations were made on 3737 typical township centralized drinking water sources (hereinafter referred to as typical water sources) which served 62 million people based on the principle that water sources should serve a large number of people, bear strong regional characteristics and cover all county level administrative regions. Among them, groundwater sources accounted for 50%, river-based

sources 28% and lake and reservoir-based sources 22%. The investigations revealed typical water sources in South China had better water quality than that of North China, and that of the western region was better than the eastern part. In terms of population, lake and reservoir-based sources had the best water quality, followed by river-based sources and groundwater sources. In terms of river basins, typical water sources along rivers in Zhejiang and Fujian Province and river basins in Southwest China had good water quality, followed by those in the Pearl River Basin, river basins in Northwest China, Liaohe River Basin, the Yellow River and Yangtze River Basin. Water quality of typical water sources in Huaihe River Basin and Haihe River Basin was poor and those in Songhua River Basin ranked the last which were mostly supplied by groundwater (Natural background value of iron and manganese exceeded the standard).

### China's New Path to Environmental Protection

In 2009, the environmental protection work in China focused on the theme of "advancing conservation culture and actively exploring a new path to environmental protection in China", and proved to be quite effective in many aspects by deepening the awareness and taking the initiative to practices.

Conservation culture is the important and strategic thoughts proposed by the CPC under the guidance of the outlook on scientific development and based on the austere realities of excessive costs of resources and environment for rapid economic growth. The 17<sup>th</sup> National Congress of the CPC identified for the first time conservation culture as one of the strategic tasks, while the fourth plenary session of the 17<sup>th</sup> CPC Central Committee upgraded its strategic status and ranked it with the economic, political, cultural and social development, and incorporated it in the great cause of socialism with Chinese characteristics.

To explore a new path to environmental protection with Chinese characteristics is a historical process for ambitious innovations and reforms and for new experience and findings. This process is never petrified or stagnant. We should integrate environment with economy and vigorously press ahead with the change of development mode and economic restructuring; put environmental protection at a more important and strategic status, and work faster to advance the historical transformations; adhere to the fundamental purpose of protecting the environment for the people, and solve prominent environmental problems that have a bearing on people's wellbeing; persist in the principle of harmony between man and nature and rehabilitate the rivers and lakes; and carry forward with the institutional and mechanism innovations and form great force by mobilizing the whole society to protect the environment. We should properly handle the relation between the whole situation and local situation, and develop macro environmental protection strategies in compliance with national realities; properly handle the relation between pollution prevention and control, and establish an overall prevention and control system; properly handle the relation between the costs and benefits and improve the effective environmental governance system; and properly handle the relation between incentive and disincentive measures, and improve the laws, regulations, policies and standards that are coordinated with the economic development.

## International Cooperation on Environmental Protection

Environmental international cooperation has made active progress in 2009 and played an active role in such areas as facilitating healthy foreign relations, promoting the three historical transformations of environmental protection, safeguarding and striving for environmental rights & interests of China, and active introduction of international funds and management skills as well as state-of-the-art technology.

International cooperation on environmental protection has been mainstreamed as a main platform and arena for high-level political activities in China. In 2009, state leaders such as Premier Wen Jiabao and Vice Premier Li Keqiang have attended 14 important foreign activities relevant to environmental protection. The amount of ministers of Ministry of Environmental Protection visited foreign countries or had international meetings was 7, MEP arranged and received 41 foreign delegations at or above vice-minister level. MEP had reviewed and approved 1641 person•times of 523 delegations visiting foreign countries in 2009. There were a total of 391 person•times of training or study in foreign countries attended by staff of Ministry of Environmental Protection and its affiliated institutions. It officially invited and received 97 foreign delegations to China with a total of 520 people.

China Council for International cooperation on Environment and Development successfully held its 2009 Annual General Meeting. Premier Wen Jiabao and Vice Premier Li Keqiang gave important instructions at the meeting. Bilateral environmental cooperation has enjoyed overall improvement. Under the overall diplomatic arrangement, MEP has successfully taken part environmental cooperation under such mechanisms as China—US Strategic and Economic Dialogue, China—US JCCT, China—Japan High Level Economic Dialogue, China—Russia Regular Premier's Meeting and China—Kazakhstan Cooperation Commission. Regional environmental cooperation has great progress. China—ASEAN Center for Environmental Cooperation has been officially set up with the development of China—ASEAN Strategy for Environmental Cooperation. As host, MEP has successfully held the 11th Tripartite Environment Ministers Meeting. It has actively organized environmental training programs for environmental officials from Africa and ASEAN countries. MEP has actively and effectively organized international negotiations on international environmental conventions such as the Stockholm Convention, Montreal Protocol, and successfully safeguarded environmental rights and interests of China. MEP has actively promoted multilateral environmental cooperation. It and UNEP have signed the Memorandum of Understanding between Ministry of Environmental Protection and UNEP for the first time. It also held a large-scale exhibition at a UN meeting on environmental protection in China titled "Exhibition on Beijing Green Olympics". It held a news conference on "Independent Assessment Report on Beijing 2008 Olympic Games". It has actively organized the Fifth Meeting of The International Panel for Sustainable Resource Management of UNEP. MEP and other organization have jointly organized the International Forum on Green Economy in China. MEP has maintained its good relations with international organizations such as World Bank, UNDP and Asia Development Bank. It had helped WB to carry out environmental publicity activity titled "Calling for Green China" in four cities of China, which has greatly improved public awareness in environmental protection.

## Marine Environment

### General Situation

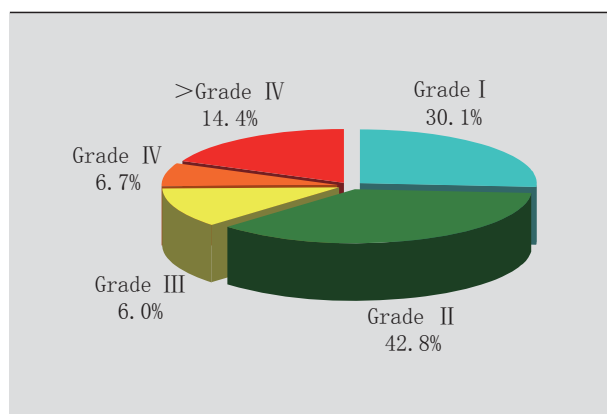
#### Marine Water Quality

In general, coastal sea waters across China were under slight pollution. Compared with that of the last year, water quality had no obvious change.

In 2009, a total of 279,940 km<sup>2</sup> coastal areas were under monitoring. Among them, 213,208 km<sup>2</sup> met Grade I or II national marine water quality standard; 18,834 km<sup>2</sup> met Grade III standard; and 47,898 km<sup>2</sup> failed to meet Grade III standard.

Monitoring results showed that 72.9% of coastal sea waters met Grade I or Grade II national marine water quality standard, up 2.5 percentage points compared with that of the last year; 6.0% met Grade III standard, down 5.3 percentage points and 21.1% failed to meet Grade III standard, an increase of 2.8 percentage points.

Among the four sea areas, the coastal waters of the Yellow Sea and South China Sea enjoyed good water quality followed by the Bohai Sea. The East China Sea had poor water quality.



Water quality of coastal sea areas

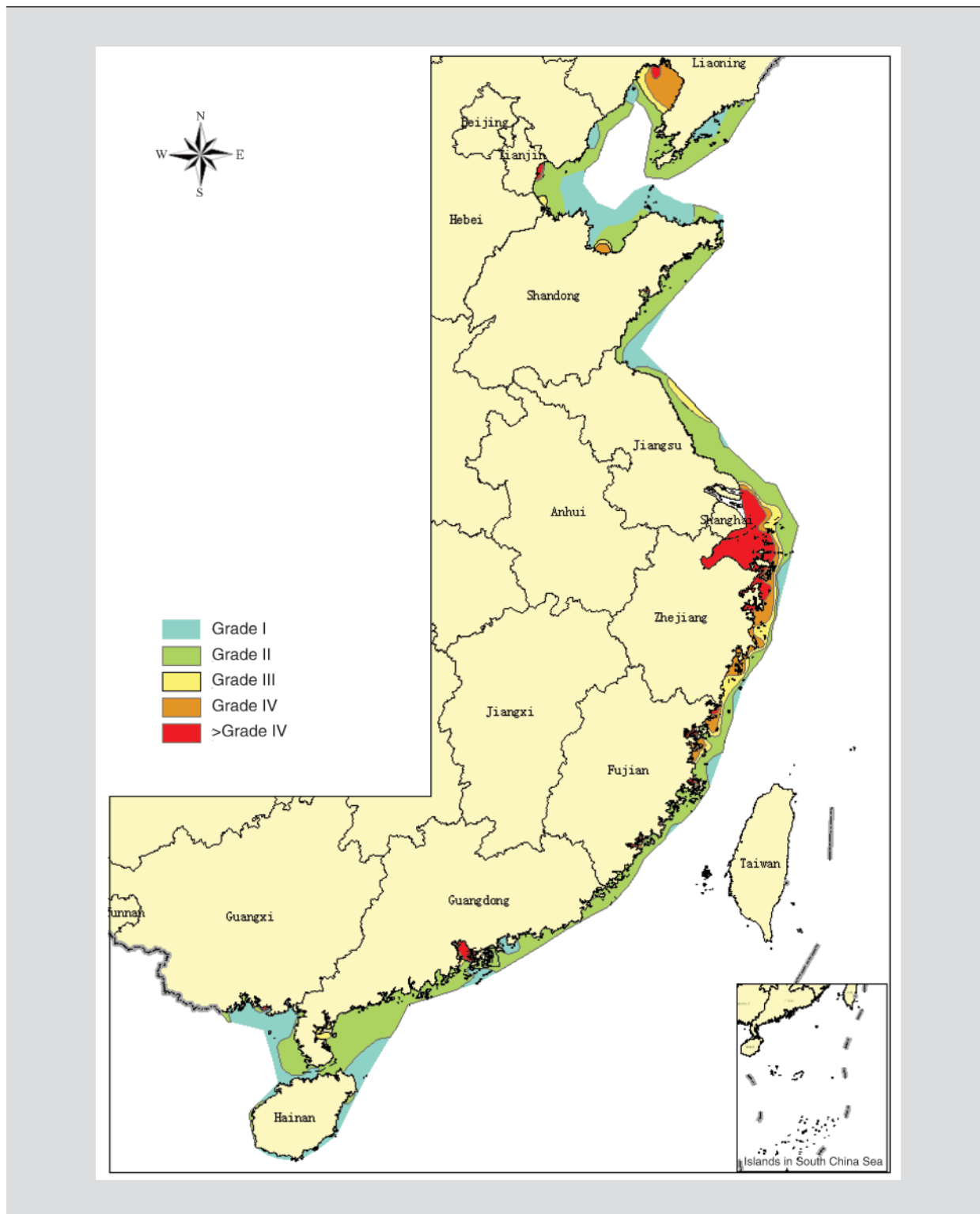
The marine water quality of Beibu Bay and the Yellow River estuary was excellent with over 90% meeting Grade I or II standard. Bohai Bay, Liaodong Bay, Jiaozhou Bay and Minjiang River estuary had poor water quality with less than 60% of the monitoring sites meeting Grade I or II standard, less than 30% failing to meet Grade IV standard. The marine water of the Yangtze River estuary, Hangzhou Bay and the Pearl River estuary 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, Jiaozhou Bay and Yangtze River estuary, meeting Grade I or II standard went up by over 10 percentage points compared with that of the last year.

**The Bohai Sea** Coastal sea areas of the Bohai Sea were under slight pollution. 71.4% met Grade I or II standard, up by 4.0 percentage points compared with that of the last year. 20.4% failed to meet Grade III standard, up 8.2 percentage points. Main pollutants were inorganic nitrogen, active phosphate and lead.

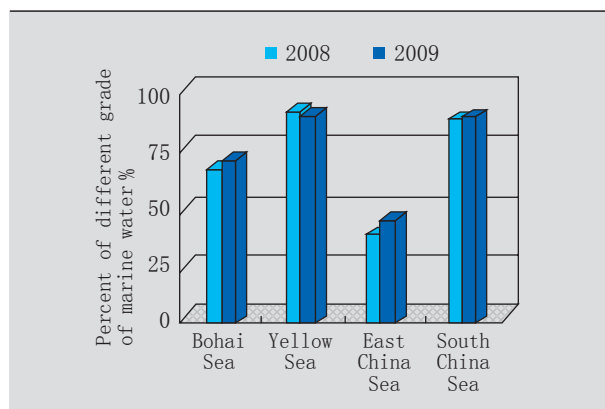
**The Yellow Sea** The coastal sea areas of the Yellow Sea were good. 90.7% met Grade I or II standard, down 1.9 percentage points compared with that of the last year. No waters met Grade IV standard. 1.9% failed to meet Grade IV standard, down 1.9 percentage points. Main pollutants were inorganic nitrogen and active phosphate and petroleum.

**The East China Sea** The coastal sea waters of the East China Sea were under intermediate pollution. 45.2% met Grade I or II standard, up 6.3 percentage points compared with that of the last year. 47.4% met or failed to meet Grade IV standard, up 4.2 percentage points. Main pollutants were inorganic nitrogen, activated phosphate and COD.

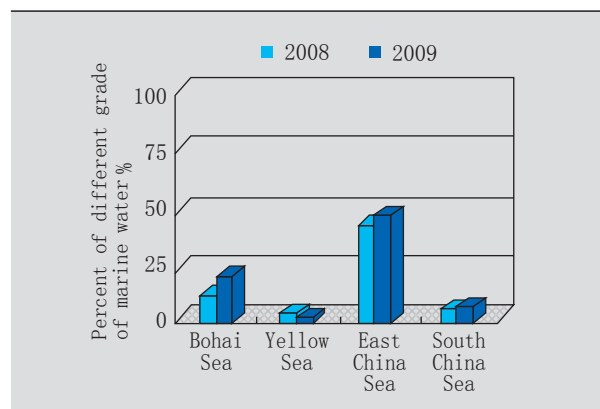
**The South China Sea** The coastal sea areas of the South China Sea were of good water quality. 90.1% met Grade I or II standard, up 0.8 percentage points compared with that of the last year. No waters met Grade IV standard. 6.9% failed to meet Grade IV standard, up 1.1 percentage points. Main pollutants were inorganic nitrogen, active phosphate and pH.



Water quality distribution of China's coastal sea



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 2009, the general quality of coastal sea sediments in China was good. The sediments of some sea areas were subject to cadmium, copper, DDT and petroleum pollution.

### Land-based pollutants

**Sea-oriented rivers** The overall quality of the 204 sea-oriented rivers under monitoring was relatively poor. The

amount of pollutants from rivers to seas was more than the amount of pollutants directly discharged into sea waters. The total in-flow amount of river pollutants to the East China Sea far exceeded that of other sea areas.

The total amount of major pollutants of the 204 sections of rivers flowing into the sea areas were 4.484 million t permanganate value, 605,000 t ammonia nitrogen, 63,400 t petroleum and 258,000 t total phosphorus.

Water quality of the monitoring sections of sea-oriented rivers

Sea name	Water quality						Total
	I	II	III	IV	V	> V	
Bohai Sea	0	3	4	5	10	28	50
Yellow Sea	0	5	15	13	11	9	53
East China Sea	0	3	7	6	4	5	25
South China Sea	0	6	19	27	6	18	76
Total	0	17	45	51	31	60	204

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

Seas	Permanganate Value(t)	Ammonia nitrogen(t)	Petroleum (t)	TP (t)
Bohai Sea	78,000	22,000	900	1900
Yellow Sea	260,000	28,000	2800	7800
East China Sea	3028,000	393,000	34900	211,500
South China Sea	1118,000	162,000	24800	36800
Total	4484,000	605,000	63400	258,000

**Direct discharge sources** The total discharge amount of waste water from 466 direct discharge sources (industrial and domestic sources as well as comprehensive pollution discharge outlets) with daily capacity larger than 100 t was

4.760 billion t. The discharged amount included 272500 t COD, 1412 t petroleum, 32757 t ammonia nitrogen, 3608 t TP, 0.3314 t mercury, 1.26 t Cr<sup>6+</sup>, 2.39 t lead and 2.36 t cadmium.

Pollution discharge from various direct sources

Type of pollution sources	Waste water (100 million t)	COD (10000 t)	Petroleum (t)	Ammonia nitrogen(t)	TP(t)	Hg(t)	Cr <sup>6+</sup> (t)	Pb(t)	Cd(t)
Industry	15.46	4.16	319	1479	82	0.0014	0.28	0.61	0.06
Domestic	6.76	6.21	303	11319	1139	—	—	—	—
Comprehensive	25.38	16.88	790	19959	2387	0.33	0.98	1.78	2.30
Total	47.60	27.25	1412	32757	3608	0.3314	1.26	2.39	2.36

Amount of major pollutants directly discharged into the four seas

Seas	Waste water (billion t)	COD (t)	Ammonia nitrogen (t)	Petroleum (t)	TP (t)
Bohai Sea	0.162	7500	1400	77.5	43.5
Yellow Sea	0.897	50100	5600	86.4	870.4
East China Sea	2.727	138500	12700	732.1	1332.6
South China Sea	0.974	76400	13100	516.5	1362.2

## Environment situation of marine fishery waters

The spawning sites, feeding sites and migrating passages of important marine fish, lobster, shellfish and algae as well as marine nature reserves were mainly subject to the pollution by inorganic nitrogen, active phosphate and petroleum. Part of fishery waters of the East China Sea was subject to relatively heavy pollution from inorganic nitrogen and active phosphate. Pearl River estuary suffered from heavy pollution of active phosphate and petroleum and Bohai Bay had heavy pollution of petroleum. Compared with that of the last year, the scope of inorganic nitrogen, petroleum and copper pollution had expanded but the pollution scope of COD saw slight drop.

Key marine aquaculture areas were mainly under inorganic nitrogen, active phosphate and petroleum pollution. Some parts of aquatic breeding areas of the South China Sea were under relatively heavy inorganic nitrogen pollution and some in the East China Sea were subject to relatively serious

active phosphate pollution. The scope of inorganic nitrogen, active phosphate and COD pollution went down while petroleum pollution range increased compared with that of the last year.

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

**Red tides** In 2009, there were 68 red tides in all seas with accumulated area of 14100 km<sup>2</sup>. The frequency and the accumulated area were level with that of the last year. Among them, large scale red tides with affected area over 500 km<sup>2</sup> numbered 6, taking place in the Bohai Bay, North of Zhoushan archipelago, Zhejiang Province beyond the Yangtze River estuary, waters between Yushan islands and Taizhou islands in central Zhejiang Province, waters near Rizhao, Haiyang and Rushan of Shandong Province off the Yellow Sea. The affected area totaled 9120 km<sup>2</sup>.

## Measures and Actions

**[ Joint law enforcement for the protection of marine environment ]** To enhance protection of marine environment and promote coordinated development of society, economy and marine environment in the coastal areas, MEP, NDRC, Ministry of Supervision, Ministry of Finance, Ministry of Housing and Urban-Rural Development, Ministry of Transport, Ministry of Agriculture and State Oceanic Administration jointly issued a Circular on Joint Law Enforcement Inspection for the Protection of Marine Environment in July 2009 and made arrangement on it. In late October, 9 state departments, namely MEP, NDRC, Ministry of Supervision, Ministry of Finance, Ministry of Housing and Urban-Rural Development,

Ministry of Transport, Ministry of Agriculture, State Oceanic Administration and Office of the PLA Environment Protection and Afforestation Committee, organized 3 teams to conduct on-site inspection after local governments had made self-examination. They went to 9 cities along the Yellow Sea, Bohai Sea and South China Sea including Nantong, Yancheng, Lianyungang, Tangshan, Huludao, Panjin, Dalian, Beihai and Qin Zhou. These inspections focused on sewage treatment plants of development zones, industrial companies and industrial parks, domestic sewage treatment plants and refuse disposal facilities of ports and quays, seawater breeding farms, nature reserves and some sea-filling and sea-closure projects. They raised requirements of rectification for problematic projects. This campaign furthered the work of marine environmental protection and solved some evident problems in this regard.

## The First National General Survey of Pollution Sources

The State Council decided on October 12, 2006 to conduct the first national general survey of pollution sources in early 2008. The standard point time of this survey was December 31, 2007 and the period data was of the year 2007. The targets included all the industrial sources, agricultural sources, domestic sources and centralized pollution treatment facilities that discharge pollutants within the territory of China.

The national general survey of pollution sources was a major study on national realities. At the outset of the survey, Premier Wen Jiabao made important instructions requesting for making detailed plans and seriously working in all aspects. The State Council set up the leading group for the first national general survey of pollution sources, with a Vice Premier as the head and leaders of ten ministries as the members. In October 2007, the State Council issued the Regulations on the National General Survey of Pollution Sources, so that the national general survey had a legal basis and could be governed by law. In May 2007, the General Office of the State Council printed and distributed the Program for the First National General Survey of pollution Sources as the guidelines of the survey.

Local areas and relevant departments had seriously implemented the Regulations on National General Survey of pollution Sources and the Program for the First National General Survey of pollution Sources over the past three years, following the principle of “the State provides unified leadership, relevant departments cooperate according to their division of duties, local areas assume responsibilities according to their administrative levels and all aspects participate in the survey”. Relevant tasks for surveys were conducted in different stages.

The general survey helped establish a database of over 5.92 million pollution sources, obtained 1.1 billion first-hand data on pollution sources and environment, and it had completed the tasks specified by the Program for the First National General Survey of Pollution Sources.

## Examination of Clean Production in Major Enterprises

In 2009, Ministry of Environmental Protection organized the statistics, summary and analysis of the information about clean production in major enterprises in each province, autonomous region and municipality in 2008. It has compiled and released the Bulletin on the Examination of Clean Production in Major Enterprises across China in 2008. It has organized such provinces as Hebei Province, Liaoning Province, Yunnan Province and Heilongjiang Province to carry out trial work on assessment, check & acceptance of examination of clean production in major enterprises. It has organized the development of technical management documents relevant to the examination, assessment, check & acceptance of clean production in key enterprises including the Technical Specifications on Assessment, Check & Acceptance of Clean production in Major Enterprises. It has organized 49 training courses for national examiner on clean production with total participants of about 2600 people. It has organized two high-level training courses for examiner on clean production with about 60 participants. In addition, Ministry of Environmental Protection has issued 12 industrial standards for clean production.

## Implementation of International Environmental Conventions

**The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management** In 2009, MEP reviewed the National Report of 17 parties and asked 110 questions. It seriously analyzed and answered 96 questions from 12 parties concerning China's National Report. MEP heading a Chinese Government delegation attended the Third Conference of Parties, and officially submitted the First National Report of China to IAEA.

**Convention on Nuclear Safety** Representative of Ministry of Environmental Protection attended the Special Meeting & Organization Meeting of the Fifth Review Meeting of the Convention on Nuclear Safety held in Vienna during September 28–October 1, 2009. The meeting discussed and adopted the Amendment and preparations for the Fifth Review Meeting of the Convention on Nuclear Safety. MEP Vice Minister Li Ganjie of China was elected as the Chairman of the Fifth Review Meeting of the Convention on Nuclear Safety (2011). Ministry of Environmental Protection as head organization has finished re-election of the Editing Committee of the Fifth National Report for the Convention on Nuclear Safety. It held the first meeting of the Editing Committee of the Fifth National Report, which discussed and approved the framework and work plan for the Fifth National Report for the Convention on Nuclear Safety. It has launched the compilation of the Fifth National Report.

**Montreal Protocol, Stockholm Convention, Basel Convention and Rotterdam Convention** In 2009, Ministry of Environmental Protection and Ministry of Housing, Spatial Planning and Environment of Netherlands jointly organized China—Netherlands Training on Management of Transboundary Movement of Waste. MEP and Japanese Ministry of Environment conducted the Third China—Japan Director General Level Dialogue on the Management of Solid Waste and the Second China—Japan Meeting of Waste Import & Export Management Departments. MEP took part in IMPEL/TFS 2009 Annual Meeting and 2009 Workshop of Asian Network on the Prevention of Illegal Transboundary Movement of Hazardous Waste.

**The Convention on Biological Diversity** MEP has developed the Strategy and Action Plan of China for Conservation of Biodiversity. It has identified 35 priority areas for protection; put forward the strategy, guidelines and principles for the conservation of biodiversity in China for the next two decades (2010–2030); determined the short, mid and long-term objectives; identified the priority areas, actions and projects and guarantee measures for doing well relevant work. China has made a catalogue for over 60,000 kinds of species (including repetition) and several hundreds of thousands of genetic resources and set up a national database of biological species by the end of 2009. 16 provinces (autonomous regions or municipalities) have conducted trial work on the assessment of biodiversity with rich basic data. MEP has primarily set up national technical system for assessment of biodiversity. MEP has taken part in a series of negotiations and meetings on the Convention on Biological Diversity.

## Atmospheric Environment

### General Situation

The air quality in urban areas across the country was good at large and better than that of last year, but some cities still suffer from relatively serious pollution. The acid rain distribution areas remained stable and acid rain pollution was still serious.

#### Air Quality

In 2009, the ambient air quality monitoring results of 612 cities in China indicated that 26 cities enjoyed Grade I standard air quality (accounting for 4.2%), 479 ones enjoyed Grade II standard air quality (accounting for 78.3%), 99 ones reached national Grade III air quality standard (accounting for 16.2%), 8 ones failed to meet Grade III standard (accounting for 1.3%). 79.6% of the cities at or above prefectural level met with air quality standard, and so did 85.6% of the county-level cities.

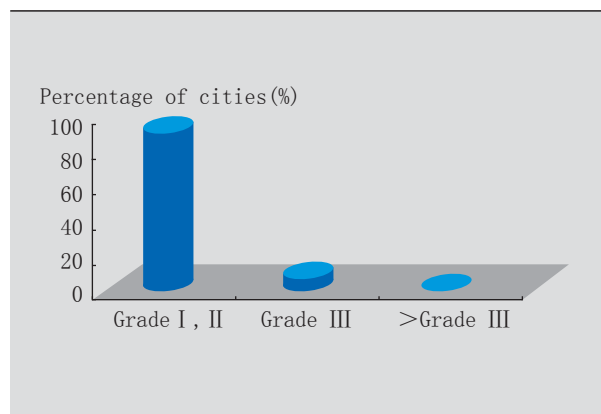
**Cities at or above prefectural level (including capitals of prefectures, autonomous prefectures and leagues)** 3.7% of the cities enjoyed national Grade I standard air quality, 75.9% enjoyed national Grade II air quality, and 18.8%

enjoyed Grade III air quality. 1.6% failed to meet Grade III air quality standard.

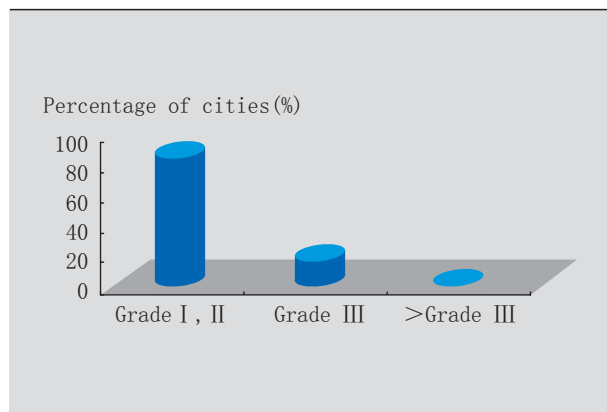
84.3% of the cities met with Grade II or higher standards in terms of PM<sub>10</sub> concentrations, and 0.3% failed to meet with Grade III standard.

91.6% of the cities saw SO<sub>2</sub> levels at or better than Grade II standard. No cities failed to meet with Grade III standard.

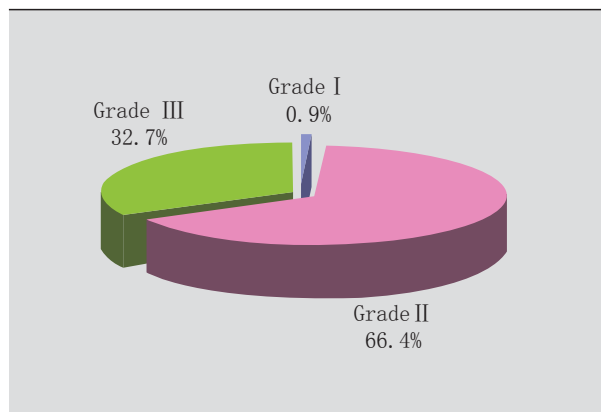
The annual average NO<sub>2</sub> levels in cities at or above prefectural level met with Grade II standard. 86.9% of these cities reached Grade I standard.



Percentage of cities with different SO<sub>2</sub> levels in 2009



Percentage of cities with different PM<sub>10</sub> concentrations in 2009



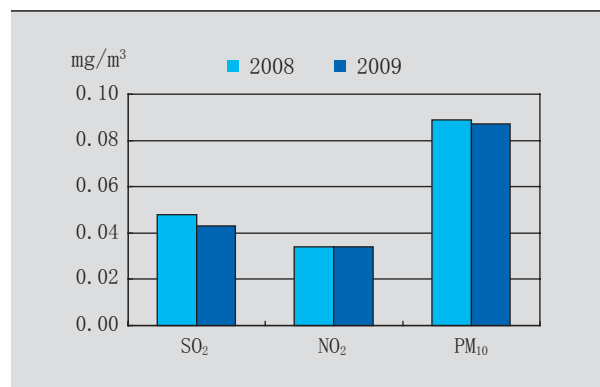
Percent of key cities with varied air qualities in 2009

**Key cities** The 113 national environmental protection key cities enjoyed improved air quality. 0.9% of them enjoyed Grade I standard air quality, 66.4% enjoyed Grade II standard air quality, and 32.7% enjoyed Grade III standard. The proportion of cities with qualified air quality increased by 9.8 percentage points compared with last year.

In 2009, the average  $\text{NO}_2$  level in key cities for environmental protection was about the same as that in 2008, and the  $\text{SO}_2$  and  $\text{PM}_{10}$  concentrations dropped slightly.

### Acid Rain

**Acid rain frequency** 258 out of 488 cities (counties) under the monitoring program saw acid rain, accounting for 52.9%. Over 25% of the precipitation in 164 cities proved to be acid rain, accounting for 33.6%, and over 75% of the precipitation in 53 cities proved to be acid rain, taking up 10.9%.



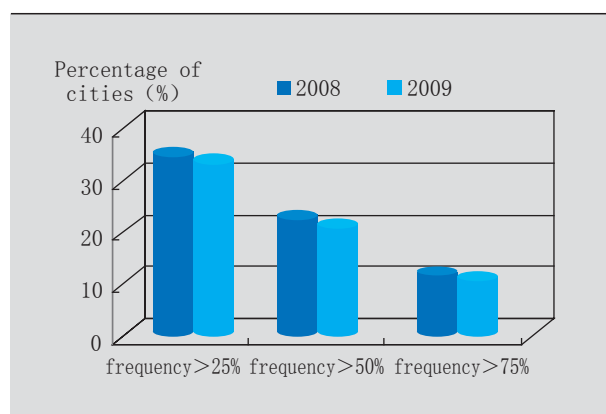
Year-on-year comparison of pollutant concentrations in key cities in 2009

Statistics of acid rain frequencies in China in 2009

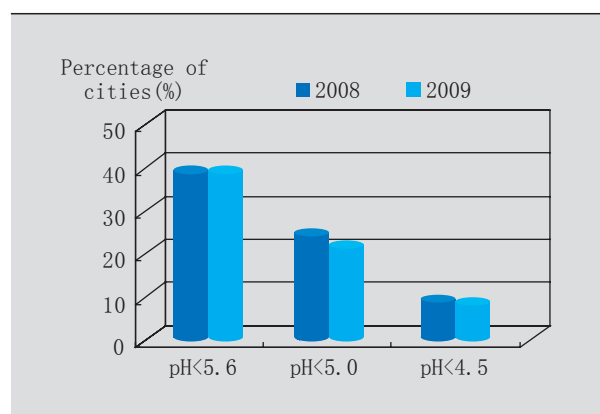
Acid rain frequency	0	0 ~ 25%	25% ~ 50%	50% ~ 75%	≥ 75%
Amount of cities	230	94	62	49	53
Percentage (%)	47.1	19.3	12.7	10.0	10.9

**Precipitation acidity** The proportion of cities with relatively serious acid rain (pH value < 5.0) went down by 2.8 percentage points and the proportion of cities with serious

acid rain (pH value < 4.5) dropped by 0.8 percentage point compared with last year.



Percentage of cities with different acid rain frequencies in 2009



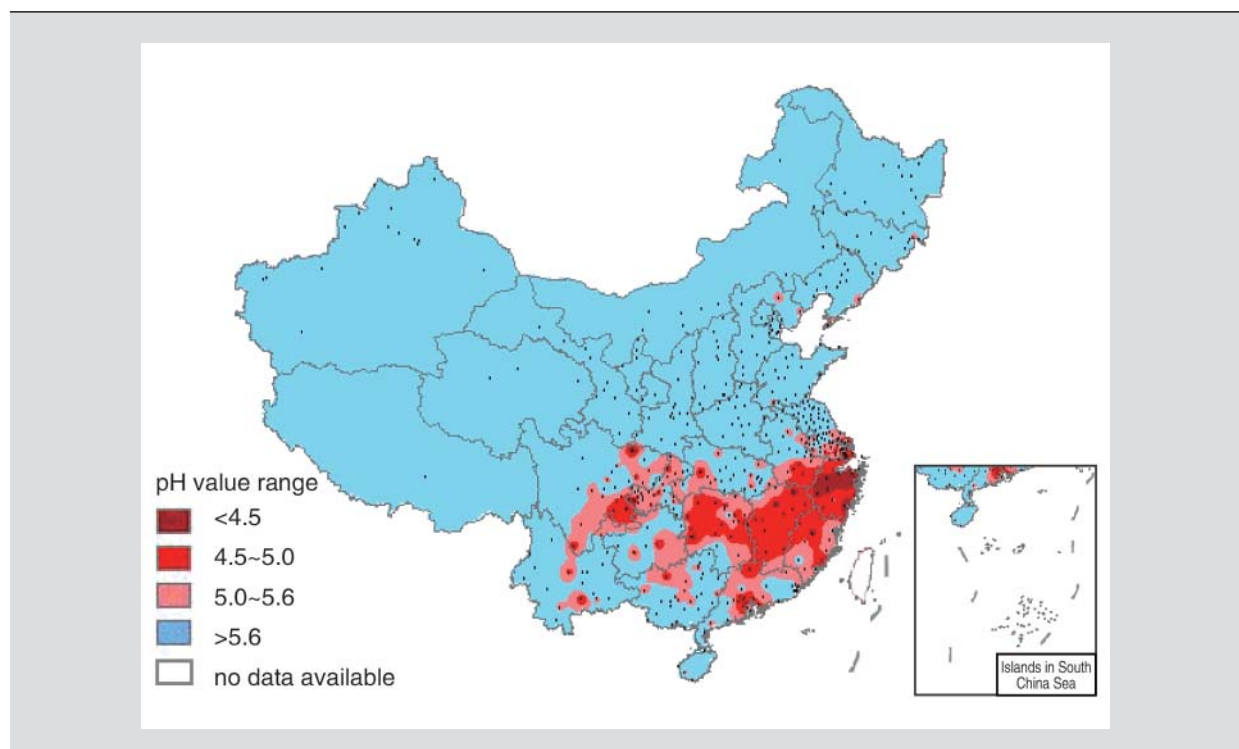
Percentage of cities with different annual average pH values of precipitation in 2009

Statistics of annual average pH values of precipitation in 2009 in China

Annual average pH value range	< 4.5	4.5 ~ 5.0	5.0 ~ 5.6	5.6 ~ 7.0	≥ 7.0
Amount of cities	39	65	85	217	82
Percentage (%)	8.0	13.3	17.4	44.5	16.8

**Acid rain distribution** Acid rain was mainly distributed to the south of Yangtze River and to the east of the Qinghai-Tibet Plateau, including most areas in Zhejiang Province, Jiangxi Province, Hunan Province, Fujian Province, and Chongqing

Municipality, and the Yangtze River Delta and Pearl River Delta. Acid rain covered about 1.2 million km<sup>2</sup>, including 60,000 km<sup>2</sup> suffering from serious acid rain. The distribution of acid rain did not have obvious changes compared with last year.



Isograms of annual average pH values of the precipitation in 2009 in China

### Emissions of major air pollutants in the waste gas

In 2009, the SO<sub>2</sub> emissions amounted to 22.144 million t, the soot amounted to 8.472 million t, and the industrial dust was 5.236 million t, down by 4.6%, 6.0% and 11.7% respectively.

Year-on-year comparison of emissions of major air pollutants in waste gas in China

Year	Item	SO <sub>2</sub> emissions (10,000 t)			Soot (10,000 t)			Industrial dust (10,000 t)
		Total	Industrial sources	Domestic sources	Total	Industrial sources	Domestic sources	
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
2009		2214.4	1866.1	348.3	847.2	603.9	243.3	523.6

## Measures and Actions

### **[ Amendments to *Law of the People's Republic of China on Prevention and Control of Air Pollution* ]**

Ministry of Environmental Protection (MEP) organized the draft amendments to *Law of the People's Republic of China on Prevention and Control of Air Pollution* in 2009. The draft amendments made adjustments to the control of the total amount of pollutants, the administration of pollution discharge permits, the environmental management of automobiles, and the penalties, in accordance with the ongoing situation in prevention and control of air pollution and the new management requirements. On December 30, the executive meeting of the Ministry of Environmental Protection considered and adopted in principle the *Law of the People's Republic of China on Prevention and Control of Air Pollution (draft amendments)*, which was reported to the Legislative Affairs Office of the State Council.

**[ Prevention and control of vehicle pollution ]** MEP intensified the efforts in prevention and control of vehicle pollution. First, MEP made public notices in a timely fashion. MEP issued a public notice in September 2009 that the national stage II emissions standard for non-road mobile machinery shall go into force as of October 1, 2009. MEP also adjusted the plans for implementing three national emissions

standards for motorcycles. Second, the vehicle management systems were constantly improved. Eco-label was introduced to vehicle management and more efforts were made to manage the environmental inspection labels. In July 2009, MEP issued the *Regulations on the Administration of Environmental Inspection Labels of Vehicles*, unifying and setting standards for the vehicle labels. Third, MEP worked hard to phase out highly polluting vehicles with yellow labels. MEP issued the *Notice on Implementing the New Policy of "Replacing Old Vehicles with New Vehicles with Subsidies" and Encouraging the Early Phase-out of Yellow-Labeled Vehicles, identifying the procedures and division of responsibilities for phasing out yellow-labeled vehicles*, and proposing requirements for local areas.

**[ Regional efforts in prevention and control of air pollution ]** Progress was made in guaranteeing good environment for the Shanghai World Expo and the Asian Games. MEP conducted surveys on Guangzhou Asian Games and Shanghai World Expo and organized symposiums to make arrangements for joint prevention and control of air pollution in Pearl River Delta and Yangtze River Delta. The plan for guaranteeing air quality for Guangzhou Asian Games had been adopted by the People's Government of Guangdong Province, while Shanghai introduced the national Stage IV emissions standard in advance on November 1, 2009. All-dimensional efforts were made to guarantee good air quality for the Asian Games and World Expo.

## Studies on Macro Strategy for China's Environment

The studies on macro strategy for China's environment started in May 2007 and completed two years later under the organization of Chinese Academy of Engineering and Ministry of Environmental Protection. According to the needs of the strategic studies and to differentiate environmental areas and factors, four task forces and 29 special tasks were established to study local environmental strategies in seven provinces (autonomous regions and municipalities directly under the Central Government). A widely represented and high-level study team was established, which involved over 50 members with the Chinese Academy of Sciences and Chinese Academy of Engineering and over 600 experts and scholars in the strategies studies and covered a variety of areas including the environmental protection, economic, social, trade, law, energy and foreign affairs areas.

According to the guidelines of "taking stock of the past, providing guidance for the present and making plans for the future", the studies focused on major issues in the field of environmental protection, and after repeated discussions and demonstrations and solicitation of opinions from all aspects, achieved fruitful findings, which included the comprehensive report, the report on outlines of the findings, the summary report of the four task forces and 29 special reports, as well as the report on the studies on the environmental strategies in seven provinces (autonomous regions and municipalities directly under the Central Government).

The symposium on macro strategy for China's environment was held in Chinese Academy of Engineering on July 21, 2009. Li Keqiang, member of the standing committee of the Political Bureau of the CPC Central Committee and Vice Premier of the State Council, attended the symposium and delivered an important speech. Li Keqiang gave full recognition to the recommendations of the above-said study on exploring a new path to environmental protection in China.

## Acoustic Environment

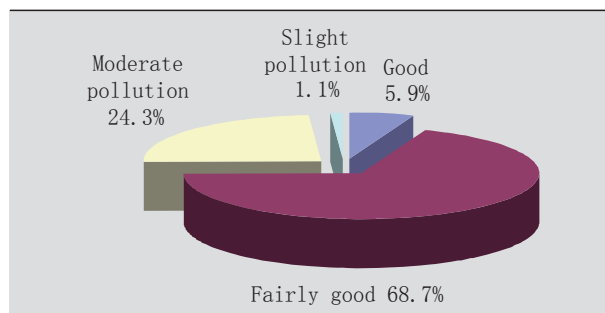
### General Situation

The area-wide acoustic environmental quality was good or fairly good in 74.6% of the cities across the country, and the same happened to 76.1% of the 113 key cities for environmental protection. 94.6% of the cities in China enjoyed good or fairly good road traffic acoustic environment and 96.5% of the key cities for environmental protection managed to do so. 87.1% of the urban function zones met with the acoustic environmental standard at day and 71.3% of them managed to do so at night.

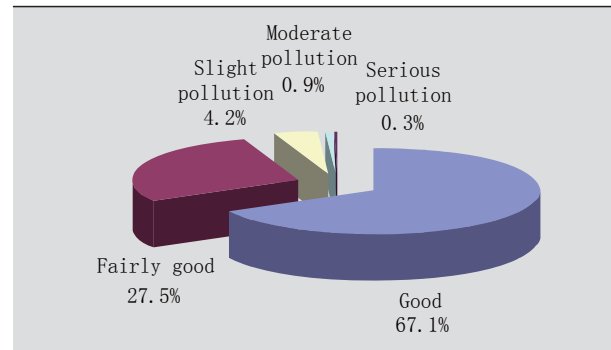
**Urban area-wide environmental noise** 5.9% of the 354 cities under national monitoring program enjoyed good area-wide acoustic environment, 68.7% enjoyed fairly good quality, 24.3% suffered from slight pollution and 1.1% suffered from moderate pollution. Compared with last year, cities with good area-wide acoustic environment decreased by 1.3 percentage points, cities with fairly good area-wide acoustic environment increased by 4.2 percentage points, cities suffering from slight pollution dropped by 3.0 percentage points, and cities suffering from moderate pollution rose by 0.1 percentage point.

The area-wide sound equivalent levels of key cities for environmental protection ranged between 45.9~60.8 dB(A). 76.1% of these key cities enjoyed good or fairly good area-wide acoustic environment, 23.0% of them suffered from slight pollution and 0.9% from moderate pollution.

**Road traffic noise** 67.1% of the 334 cities under



Urban Area-wide Acoustic Environmental Quality in 2009



Urban Road Traffic Acoustic Environmental Quality in 2009

national monitoring program enjoyed good road traffic acoustic environment, 27.5% of them recorded fairly good acoustic environment, 4.2% saw slight pollution, 0.9% saw moderate pollution and 0.3% suffered from serious pollution. Compared with last year, cities with good road traffic acoustic environment went up by 1.8 percentage points, those with fairly good acoustic environment rose by 0.4 percentage point, the percentage of those with slight noise pollution was about the same as last year, those suffering from moderate pollution decreased by 2.0 percentage points, and those suffering from serious pollution were down by 0.2 percentage point.

The average equivalent sound levels of road traffic in key cities for environmental protection ranged between 63.0 and 71.6 dB(A). 57.5% of these key cities enjoyed good road traffic acoustic environment, 39.0% enjoyed fairly good acoustic environment, and 3.5% suffered from slight pollution.

**Noise in urban functional areas** In the monitored sites of the functional areas of 244 cities under national monitoring program, 7,288 site•times were recorded up to the noise standards at daytime throughout the year, accounting for 87.1% of the total; 5,968 site•times were registered up to the noise standards at night, accounting for 71.3%. The functional areas met with noise standards at more days than nights, and Type 3 functional areas recorded better acoustic environment than other types.

86.3% of the functional areas in key cities for environmental protection met with noise standards at day and 67.3% of them managed to do so at night.

The monitored sites in urban functional areas up to noise standards in 2009 in China

Type of the functional areas	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	111	101	1608	1447	2072	1929	1536	1442	1961	1049
Monitored site•times	190	190	1912	1912	2389	2389	1636	1636	2240	2240
Up-to-standard rate (%)	58.4	53.2	84.1	75.7	86.7	80.7	93.9	88.1	87.5	46.8

## Measures and Actions

### 【 Prevention and control of noise pollution 】

Thorough efforts were made to evaluate the *Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise*. On October 29, MEP reported to the Environment and Resources Conservation Committee under NPC on the progress and problems of the work for prevention and control of noise pollution, as well as the proposals for next move. MEP also joined the Environment and Resources Conservation Committee to go to Beijing Municipality and Zhejiang Province for

surveys on prevention and control of noise pollution, and drafted the evaluation report on *Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise*. MEP also worked harder on the groundwork for prevention and control of noise pollution. First, MEP inaugurated the drafting of the opinions on the administration of prevention and control of noise pollution. Second, MEP organized national symposiums on prevention and control of noise pollution to exchange experience in this regard in Harbin in August and in Beijing in December. Third, MEP organized the publicity on implementing noise standards and the compilation of laws, regulations, policies and documents related to prevention and control of noise pollution.

## The Fourth National Forum for Environment and Health

MEP and Ministry of Health co-organized the Fourth National Forum for Environment and Health in Guangzhou City, Guangdong Province on September 17, 2009.

The theme of the Forum was "care the environment and health and build a harmonious society". The participants reached consensus on the importance, urgency, and challenging nature of the environment and health problems in China, convinced that only do we enhance the inter-department coordination, make full use of the advantages of the departments, cooperate and share resources, and take effective measures step by step at law-making, policy and implementation levels, can we make achievements in the fields of environment and health.

Relevant departments under the State Council, including Ministry of Science and Technology, Ministry of Land Resources, Ministry of Transport, Ministry of Commerce, State Administration of Work Safety, China Meteorological Administration, State Administration of Traditional Chinese Medicine were represented at the Forum. The representatives discussed freely their progresses in work and exchanged their experience, laying a good foundation for strengthening inter-departmental cooperation and advancing the implementation of the National Action Plan for Environment and Health.

The participants focused on two major topics "advancing the scientific development of the environment and health work" and "strengthening the legal improvement of environment and health", had all-dimensional and thorough discussions on the situation, specific tasks, priority areas, actions to be taken in the future and the working mechanism for multi-department coordination in the fields of environment and health. The discussions focused on many aspects, such as the institutions and mechanisms, law-making standards, information sharing, basic research, and publicity and education for environment and health issues.

## Solid Waste

### General Situation

In 2009, the generated industrial solid wastes amounted to 2,040.942 million t, up by 7.3% than that of last year. 7.107 million t of these wastes were discharged to the environment without any treatment, down by 9.1% than that of last year.

1,383.486 million t of wastes (including some wastes stored in previous years) were comprehensively utilized, 208.886 million t were stored, and 475.137 million t were disposed of. The generated hazardous wastes totaled 14.298 million t. 8.307 million t of hazardous wastes (including some wastes stored in previous years) were comprehensively utilized, 2.189 million t were stored, and 4.282 million t were disposed of.

The generation and disposal of industrial solid wastes in China in 2009

Generated (10,000 t)		Comprehensively utilized (10,000 t)		Stored (10,000 t)		Disposed (10,000 t)	
Total	Hazardous wastes	Total	Hazardous wastes	Total	Hazardous wastes	Total	Hazardous wastes
204094.2	1429.8	138348.6	830.7	20888.6	218.9	47513.7	428.2

### Measures and Actions

**【 Sharing information on the prevention and control of environmental pollution by solid wastes in large- and medium-sized cities 】** In 2009, 230 cities across the country shared information on the prevention and control of solid waste pollution in 2008. Compared with last year, 24 more cities joined the club of cities which made public information in this regard. With better organization, Shandong, Zhejiang, Jiangsu, Henan, Guangdong, Gansu, Shanxi, Hebei, and Gansu Provinces managed to have more of their cities share such information.

**【 Issuance of hazardous waste operation licenses 】** In 2009, MEP pressed ahead with the implementation of Measures on the Administration of Hazardous Wastes Operation License, and issued successively Guidelines on the Recording and Reporting of the Operations in Hazardous Wastes Operation Entities and the Guidelines on the Examination and Licensing of Hazardous Wastes Operation Entities. MEP issued the Contingency Plan for the Management of Medical Wastes from Influenza A (H1N1) Epidemic, in order to address the influenza A (H1N1) epidemic and enhance the guidance on the treatment and

disposal of medical wastes. MEP and the environmental protection bureaus of 31 provinces (autonomous regions and municipalities directly under the Central Government) had issued over 1,400 hazardous wastes operation licenses by the end of 2009. The licensed hazardous wastes operation entities utilized and disposed nearly 8 million t of hazardous wastes in 2009. The environmental protection departments across the country went to the hazardous wastes operators for thousands of times to provide field inspection and guidance, which intensified the management over these operators.

**【 Examination and approval of imported wastes 】** In 2009, MEP, together with Ministry of Commerce, National Development and Reform Commission (NDRC), General Administration of Customs, and General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), issued a public notice on adjustments to the List of Imported Wastes Subject to Management. MEP also issued the Regulations on the Administration of Environmental Protection for Imported Iron and Steel Scraps (on trial), in order to identify and set standards for the examination and approval procedures for imported iron and steel scraps and their environmental protection requirements. 13,265 solid waste import licenses were issued to 2,977 imported waste processors, and 59.81 million t of wastes were imported (including 413 scrapped vessels which weighed 3.05 million

light displacement t), which cost 22.39 billion U.S. dollars. MEP enhanced the information exchange with relevant countries on the control over the trans-boundary movement of wastes and joint inspection on the import licenses. They exchanged information for 129 times and stopped 38 groups of wastes from moving illegally into China.

**【 Export of hazardous wastes 】** In 2009, MEP handled 12 applications for export of hazardous wastes and eight were endorsed. The exported hazardous wastes amounted to 4,330 t, including electroplating sludge, nickel-cadmium batteries, nickel-hydrogen batteries, lithium batteries, alkali-manganese/manganese-zinc batteries, and waste mercury lamps.

**【 Management of electronic wastes 】** On February 25, 2009, the State Council issued the Regulations on the Administration on the Recycling of Used Electrical Appliances and Electronic Products, which identified the systems on collection and treatment of used electrical appliances and electronic products, the qualification accreditation for their treatment, the funds for their treatment and the development plans. To implement the policy of the State Council on “replacing used home appliances with new ones under subsidies”, MEP issued the Guiding Opinions

on Implementing the Policy of Replacing Used Home Appliances with New Ones under Subsidies and Enhancing the Environmental Management for the Dismantling and Treatment of Used Home Appliances, in order to facilitate the prevention and control of pollution caused during the implementation of this policy.

**【 Comprehensive treatment of chromium residues 】** Over two million tons of chromium residues had been treated by the end of 2009. Among the 19 provinces (autonomous regions and municipalities directly under the Central Government) included in the Program for Comprehensive Treatment of Pollution by Chromium Residues, Shandong Province and Zhejiang Province had disposed all of their chromium residues. The facilities for treatment of chromium residues were built up and put into use in Hebei Province, Shanxi Province, Inner Mongolia Autonomous Region, Liaoning Province, Jiangsu Province, Henan Province, Hunan Province, Hubei Province, Chongqing Municipality, Sichuan Province, Yunnan Province, Gansu Province, Shaanxi Province, Qinghai Province and Xinjiang Autonomous Region. The treatment facilities in Tianjin Municipality and Jilin Province were under construction.

### Examination and Approval of Environmental Impact Assessment Statements of Construction Projects

In order to carry out a series of arrangements of the Central Government on promoting steady and fast economic development, MEP has accelerated the examination and approval of environmental impact assessment (EIA) statements of construction projects in accordance with the policies of the Central Government and the environmental conditions for access to such projects, by strictly abiding by environmental laws, regulations and standards and by shortening the examination period with graded examinations and classified assessment.

In 2009, MEP issued 400 documents as written replies to the EIA statements of construction projects (excluding nuclear and radiation projects), involving a total investment of 2.7 trillion yuan. MEP rejected, gave no written replies to or delayed the examination of EIA statements of 49 unqualified projects with total investment of 190 billion yuan. MEP suspended the examination and approval of the EIA statements of such construction projects as the development of hydropower in the middle reaches of Jinsha River, the construction projects of China Huaneng Group, China Huadian Corporation and Shandong iron and steel industry due to their prominent infringements against Environmental Impact Assessment Law and ordered the cease of their construction. MEP finished environmental check and acceptance of 289 construction projects upon their completion. It entrusted regional environmental protection supervision centers or local environmental protection departments to carry out site inspections for environmental check & acceptance of 59 construction projects, and ordered 15 construction projects in violation of the “three simultaneities system” and the environmental check & acceptance regulations to make corrections within a given period of time. It is expected that the construction projects having passed check & acceptance will reduce about 498,000 t SO<sub>2</sub> emission and around 120,000 t COD each year.

# Radiation Environment

## General Situation

The radiation environment all over the country was good in 2009. The environment ionizing radiation level remained stable, and there were no obvious changes in the environment ionizing radiation level in the vicinity of nuclear facilities and equipment using nuclear technologies. The environment electromagnetic radiation level was good at large. The environment electromagnetic radiation levels around electromagnetic radiation facilities met with national standards, except that some high-power radiators saw the integrated field strengths in part of their vicinities exceeding national standards.

**Environment Ionizing Radiation** The environment  $\gamma$  radiation dose rate, the radioactivity levels of gross  $\alpha$  and gross  $\beta$  in aerosol and air precipitum, and the radioactivity of HTO in the air in key cities across the country were within normal range. The radioactivity of radionuclides in the seven major waters (Yangtze River, Yellow River, Pearl River, Songhua River, Huaihe River, Haihe River and Liaohe River), southwest and northwest China rivers, rivers in Zhejiang and Fujian Provinces, and major lakes and reservoirs did not change compared with the monitoring results in previous years. Among others, the radioactivity of natural radionuclides was the same as the values monitored during the national survey on natural radioactive levels from 1983 to 1990. The radioactive levels of gross  $\alpha$  and gross  $\beta$  in monitored drinking water sources were lower than the limits specified in *Standards for Drinking Water Quality (GB5749-2006)*. The radioactive levels of artificial radionuclides Sr-90 and Cs-137 in coastal seawaters were within the limits specified in the *Sea Water Quality Standard (GB3097-1997)*. The radioactivity of radionuclides in soils did not change compared with monitoring results in previous years, among others, the radioactive level of natural radionuclide was about the same as the values monitored during the national survey on natural radioactive levels from 1983 to 1990.

**Environment ionizing radiation in the vicinity of in-service nuclear power plants** Qinshan Nuclear Power Base in Zhejiang Province, Dayawan/Ling'ao Nuclear Power Plant

in Guangdong Province, and Tianwan Nuclear Power Plant in Jiangsu Province were in safe and normal operations. The annual average  $\gamma$  radiation dose rates (without deducting the response to the cosmic rays) monitored by the consecutive monitoring systems in the vicinities of the above three power plants were 103.1nGy/h, 124.5nGy/h and 101.5nGy/h respectively, within the natural background levels of their whereabouts. No radiation exposures that exceeded the dose limits specified by national standards were recorded in nuclear power plants. In the air, rainwater, surface water and some life-form samples taken from key residential areas near Zhejiang Qinshan Nuclear Power Base, the radioactivity of Tritium was higher than those before the Base was put into use, so did the Tritium radioactivity in seawaters near the outlets of Guangdong Dayawan/Ling'ao Nuclear Power Plant and Jiangsu Tianwan Nuclear Power Plant. However, their additive doses exposed to the public was far lower than the limits set by the national standards. The radioactivity of radionuclides other than Tritium in the environment media in the vicinity of in-service power plants did not have obvious changes.

**Environment ionizing radiation in the vicinity of other reactors and nuclear fuel cycle facilities** In the vicinity of scientific research institutions such as 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, radioactivity levels of radionuclide in samples of aerosol, air precipitum, surface water, soils and life forms did not have obvious changes compared with the monitoring results in previous years. The radioactive levels of gross  $\alpha$  and gross  $\beta$  in drinking groundwater were lower than the limits set by *Standards for Drinking Water Quality (GB5749-2006)*. In the vicinity of nuclear fuel cycle facilities 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 within the normal range.

No abnormal level of radionuclide due to the production, processing, storage and treatment activities of the businesses was observed in other environmental media.

**Environment ionizing radiation in the vicinity of uranium mines and metallurgical plants and associated radioactive mines** In the vicinity of uranium mines and metallurgical plants including 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 radioactivity in the air, the radioactivity of gross  $\alpha$  and gross  $\beta$  in the aerosol and air precipitum, and the radionuclides including Uranium and Radium-226 in ground water and life form samples saw no abnormal levels. However, in a few uranium mines and metallurgical plants, 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 than those before those mines and metallurgical plants started operation. 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 metallurgical plants saw higher levels of radionuclide Uranium and Radium-226 than the limits specified by *Regulations for radiation and environment protection in uranium mining and milling (GB23727-2009)*. The development, metallurgical and processing activities in some associated radioactive mines including Baiyun'ebo Mine affected local environment to some extent.

**Environment electromagnetic radiation level in the vicinity of electromagnetic radiation facilities** The environment 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 limits specified by *Regulations for Electromagnetic Radiation Protection (GB8702-88)* for public exposure. The integrated field strengths in some monitoring sites of the environmentally sensitive sites near several large radio transmitters exceeded slightly the limits specified by *Regulations for Electromagnetic Radiation Protection (GB8702-88)* for public exposure. The power frequency field strength and magnetic induction intensity in the

environmentally sensitive sites near the power transmission lines and transformers under the monitoring program were lower than the power frequency evaluation standard for residential areas and the around-the-clock public exposure limits set by the *Technical Specifications for Environmental Impact Assessment of Electromagnetic Radiation by the 500kV Ultra-high Pressure Power Transmission and Transformation Projects (JH/T24-1998)*.

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## Measures and Actions

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**[ Nuclear and radiation safety regulation ]** MEP worked faster to make regulations on nuclear and radiation safety, and compiled *Regulations on Nuclear and Radiation Safety and Standards on Nuclear and Radiation Safety*. MEP also issued a series of regulations such as *Regulations on the Administration of Safe Transportation of Radioactive Substances* and some supporting rules and regulations. MEP set standards for the administrative examination and approval of nuclear equipment and enhanced the supervision and inspection on nuclear safety; worked harder on the daily supervision and inspection on the safe operation of nuclear power plants and the feedback on experience in the operations of these plants; enhanced the regulation, examination and approval of in-service and proposed nuclear power plants, seriously implemented the examination and approval systems, and guarded at sources the pass for access to such projects; facilitated the new projects by the principle of "setting preconditions for receiving the applications for projects and forbidding the construction before getting approved" and "being active, reliable, and orderly and achieving balanced development"; worked harder to standardize the licensing procedures for radiation safety, and inspected and supervised the granting of such licenses to radioactive sources in the provinces (autonomous regions and municipalities directly under the Central Government) across the country.

**[ Monitoring of the radiation environment ]** According to the Outline of the National Work on Monitoring of Radiation Environment in 2009, MEP improved the working mechanism for monitoring the radiation environment, worked out scientific technologies and methods for monitoring the radiation environment, completed the monitoring on radiation environment under national program, made amendments to nine national standards on monitoring methods, and evaluated the performances on the operation of national radiation environment monitoring network. Efforts were made for emergency monitoring on the nuclear radiation in

the northeast border areas and for the emergency monitoring on nuclear and radiation safety for the commemoration of the 60th anniversary of the National Day. Efforts were also made to monitor the electromagnetic environmental impacts of the demonstration project on 1000kV Southeast Shanxi Province-Nanyang City-Jingmen City Ultra High Pressure Alternative Currents Experiment, and amended a group of standards on the electromagnetic radiation environmental quality and pollution control.

The construction projects, which were funded by the Special Fund under Central Budget for Reduction of Major Pollutants, and on nuclear and radiation monitoring capacity

building, were facilitated in all dimensions. The environmental protection bureaus of 31 provinces (autonomous regions and municipalities directly under the Central Government) signed 66 contracts. Twenty one on-line pre-warning monitoring sites and four data centers of important nuclear facilities such as China Institute of Atomic Energy were built up, initially establishing the dynamic, data-sharing network for pre-warning monitoring of the radiation environment for important nuclear facilities. The nuclear and radiation safety supervision stations of relevant provinces and autonomous regions were provided with four field emergency monitoring vehicles and four vehicle-borne mobile laboratories.

### The Key Science & Technology Project on Control and Treatment of Water Pollution

The year 2009 was critical to the transition from programming to implementing the Key S&T Project on Control and Treatment of Water Pollution (hereinafter referred to as the Key S&T Project). Under the unified leadership of the leading group for the Key S&T Project, Ministry of Environmental Protection and Ministry of Housing and Urban-Rural Development cooperated closely to advance the implementation of the Key S&T Project.

On February 19, 2009, the leading group held the inauguration meeting in Beijing for implementing the Key S&T Project and made arrangements for it. In April, MEP and Ministry of Housing and Urban-Rural Development jointly issued a document, requesting relevant departments to strengthen organization and leadership, clarify their respective duties, pay close attention to carrying out the demonstration projects and securing the counterpart funds, and work faster to conduct the inauguration projects in 2008. From September to October, leaders from MEP and Ministry of Housing and Urban-Rural Development headed a team of officials from the members of the leading group to investigate the organization and implementation of the projects (subjects) in key watersheds. They communicated with local governments concerned on problems such as failure to provide conditions for the projects and poor organization and management, greatly pushing forward the provision of relevant conditions. On December 28, 2009, the inauguration meeting for programming the 12<sup>th</sup> Five-Year Plan for Implementing the “Key S&T Project on Control and Treatment of Pollution to Waters” & the symposium on S&T needs of local areas were held in Beijing. The meeting analyzed and wrapped up the experience in implementing the 11<sup>th</sup> Five-Year Plan for Implementing the “Key S&T Project on Control and Treatment of Pollution to Waters” and the shortages, and made arrangements for programming the 12<sup>th</sup> Five-Year Implementation Plan and other major tasks in 2010.

Since the inauguration meeting for implementing the “Key S&T Project on Control and Treatment of Pollution to Waters”, entities involved in the projects and subjects worked on their tasks and set up field working stations and pre-production testing bases. Efforts were started to conduct the demonstration projects and supporting projects and to secure funds concerned. They coordinated greatly with the plans for prevention and control of water pollution in river basins and the major pollution treatment projects. The demonstration projects were under design and construction, and the stage-based studies and R&D of key technologies were basically completed.

# Nature and Ecology

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## General Situation

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**Development and Management of Nature Reserves** By the end of 2009, there were 2541 nature reserves of all kinds at different levels in the country (excluding those in Hong Kong, Macao and Taiwan) with total area of about 147 million ha. The area of land nature reserves took up about 14.7% of total land area in China. Among them, 319 were national nature reserves with total area of 92.67 million ha, accounting for 12.6% of total amount and 62.7% of total area. 28 nature reserves were included in the UNESCO "Man and Biosphere Network", over 20 nature reserves became parts of World Natural Heritages.

There were 2012 nature reserves in forestry system with total of 122.882 million ha by the end of 2009, accounting for about 12.8% of total land area. Among them, 247 were national nature reserves with total area of 77.0117 million ha.

There were over 170 various kinds of marine nature reserves by the end of 2009. Among them, 32 were national marine nature reserves, 110 marine nature reserves at local level. There were over 30 special marine protection areas, 16 of them at national level.

There were over 200 aquatic species nature reserves by the end of 2009. Among them, 16 were national level, 52 were provincial level, and over 130 at city (county) level with total area of over 100,000 m<sup>2</sup>. The amount of wild aquatic species under key national conservation program in the nature reserves took up 40% species that should be protected.

There had been 118 national biotope protected areas for agricultural wild plant species by the end of 2009. They have effectively protected precious and endangered agricultural biological species resources and provided strategic reserves for the development of agricultural biotechnology.

**Species** China boasts large land and marine areas with complex and diversified natural conditions, which nurtures rich species resources and diversified ecosystems.

China has all kinds of terrestrial ecosystems including forest, shrubbery, grassland, savanna, grassy marshland, desert and wetland. There are 212 types of forests, 36 types of bamboo forests, 113 types of scrubs, 13 types of grassy

couch, 77 types of meadow, 55 types of grassland and 52 types of deserts. There are 17 types of vegetation in tundra, alpine cushion-like vegetation and vegetation on mountain stony flood land. Natural wetlands in China include 19 types of marshes, 14 types of them are herbaceous marsh, 4 types of woody plant marsh and one type of peat moss.

China has four big off-shore marine eco systems such as the Yellow Sea, East China Sea, South China Sea and Heichao waters. There are typical marine ecosystems such as coastal wetlands, mangroves, coral reef, estuary, gulf, lagoon, island, up currents, seaweed beds as well as natural landscapes and natural remains such as ancient shell dyke, seabed ancient forest, marine erosion and marine accumulation geomorphology.

China has 34984 of higher plant species. There were 2541 bryophyte species, 2270 pteridophyte species, 245 species of gymnosperm and 29816 species of angiosperm. In addition, China has almost all woody plant species in temperate zone.

China has 6481 species of vertebrate, including 581 mammalian species, 1331 bird species, 412 reptile species, 295 amphibian species and 3862 fish species. A total of 420 species of precious and endangered wild animal species are in the national name list of wild animals under key protection program. Several hundreds of animal species such as giant panda, red ibis, snub-nosed monkey, South China tiger and Chinese alligator only exist in China.

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## Measures and Actions

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### **[ Protection and restoration of wetland ecosystem ]**

In 2009, the implementation of 41 forest wetland projects finished the investment of 223.87 million yuan from the central budget. The authority had launched the second national investigation on wetland resources and finished the investigation in the following six provinces and municipalities such as Beijing, Tianjin, Jilin, Heilongjiang, Jiangsu and Guangdong. There were 62 new trial sites of national wetland parks, totaling 100. Trial work on the confirmation of important national wetland was carried out in Liaoning

Province, Heilongjiang Province and Guangdong Province. Xixi Wetland in Hangzhou was a new internationally important wetland with total amount of internationally important wetland being 37 in China. At present, wetland protection network dominated by wetland nature reserves and wetland parks has taken shape with total area of 17.95 million ha under protection, accounting for 49.6% of total area of natural wetland with wetland protection rate up by 0.6 percentage point than that of the last year.

**【 Development and management of marine nature reserves 】** The administrative institution of each nature reserve has actively strengthened the utilization, development and supervision on law enforcement in waters of marine protected areas. Chinese marine supervision institution has been set up in each marine nature reserves at national level. National and sector standards including the Technical Specifications on the Management of Development of Marine Nature Reserves have been released. The authority has carried out management activities such as development of plan, supervision on law enforcement, construction of infrastructure, scientific research & investigations, ecological monitoring, prevention and control of disasters, education & publicity, public participation and foreign cooperation. China has primarily developed a marine nature reserves system with basically appropriate layout, complete type and increasing functions. The authority has actively facilitated the development and trial work on eco compensation system for marine ecological damages, provided economic regulatory instrument for marine ecology conservation policy that harmonizes development and protection and provided sustained financial mechanism for the protection and development of marine ecology. In areas with concentration of typical marine ecological systems, invasion of alien species and those sensitive to climate change, the authority has organized and conducted a number of typical projects on restoration of marine ecology. The authority has actively promoted the establishment of cooperation and joint action mechanism between marine administrative department and environmental protection department. The two departments have conducted trial work on the control of total discharge of pollutants.

**【 Comprehensive management of nature reserves 】** Ministry of Environmental Protection has distributed the Guidelines for Standardized Development of National Nature Reserves (Trial) and organized the application and selection of 2009 projects employing national special fund for capacity building in national nature reserves. The central government allocated 100 million yuan fund to support capacity building of 58 national nature reserves. 16 new national nature reserves have been established and 5 national nature reserves have adjusted their scope upon the approval of the State Council.

According to the requirement of the General Office of the State Council, Ministry of Environmental Protection has identified and made public the area, scope and functional zoning of the 21 national nature reserves. Employing environment satellite, Ministry of Environmental Protection has carried out remote sensing and site visits in the proposed national nature reserves and those under adjustment. Ministry of Environmental Protection has set up the Fifth Review Committee for National Nature Reserves, which conducted the review work in 2009.

Ministry of Environmental Protection in cooperation with Ministry of Land and Resources, Ministry of Water Resources, Ministry of Agriculture, State Forestry Administration, Chinese Academy of Natural Sciences and State Oceanic Administration has assessed the management of 50 national nature reserves.

Environmental protection authority has strengthened supervision and management of development and construction relevant to nature reserves, reviewed a group of construction projects involving nature reserves, investigated and sanctioned some environmental infringements involving national nature reserves.

**【 Development of aquatic genetic resource protected areas, fish proliferation & artificial releasing, suspension and banning of fishing 】** Ministry of Agriculture has made public 57 national protected areas (the third group) for aquatic genetic resources, they are distributed in 36 rivers and 14 lakes in such waters as the Yangtze River, Heilong River and Pearl River, and seven aquatic ecosystems in gulf, islands and tidal land in the Bohai Sea, Yellow Sea and East China Sea, which could protect over 100 endangered or endemic aquatic species with important commercial value including four kinds of major endemic fish species, *Pseudosciaena polyactis*, sea cucumber, and their important reproduction or habitats such as spawning sites, bait sites, winter growth sites and migration passages.

In 2009, the authority has made public the Regulations on the Management of Proliferation and Artificial Release of Aquatic Species. 590 million yuan were invested in proliferation and artificial release of aquatic species across the country with release of 24.5 billion fry of fish, shrimp, crab and shell species. National authority had conducted 12 proliferation and artificial release of aquatic species, driving over 10,000 artificial release activities at local levels across China. The fishing ban period in the Yellow Sea, Bohai Sea, East China Sea and South China Sea extended by half a month. The types of fishing operation under banning including all types except single gill net and fishing tackle. In 2009, marine fishing suspension involved 110,000 motor fishing boats involving nearly 1 million fishermen. The authority has

printed out and distributed the Circular on Strengthening the Management during 2009 No-fishing Season in the Yangtze River. It organized the law enforcement inspection during 2009 no-fishing season in the Yangtze River. Ten provinces (autonomous regions and municipalities) along the river had organized 5340 law enforcement inspections with mobilization of 7408 boat-times and 70032 person•times involved in inspection. They had tracked down 2112 boat-times violations.

#### **【 Protection of agricultural wild plant species 】**

In 2009, Ministry of Agriculture organized agricultural department of each province (autonomous region and municipality) to carry out systematic investigation on 143 species including membranous milk vetch, *Tricholoma mongolicum*, *Lycium cylindricum*, *Capsicum frutescens*, *colyx tea*, *Orchidaceae* (including all genres and species), *Liliaceae Lilium* (all species) and found 2028 distribution sites, GPS positioning; The authority has collected 13 species including wild rice, wild bean, wild relatives of wheat, wild tea trees, wild mulberry, wild ramie and wild citrus for conservation with collection of 1311 samples of various kinds of such species, which have been stored in national seed bank or seedling nursery. The agricultural property, pest & disease resistance studies on the collected wild rice and beans have

identified the general wild rice with strong resistance to heat, plant hopper, bacterial blight and rice blast and wild bean with strong resistance to wet and cold. These good resources would lay a sound foundation for tapping new genes.

**【 Prevention and control of the invasion of alien species 】** In 2009, Ministry of Agriculture continued its technical demonstration and extension activities for eliminating 15 major dangerous invasive alien species in agriculture such as Buffalobur (*Solanum rostratum*), alligator weed, *Flaveria bidentis* (L.) Kuntza, Mikania micranth and giant Amazon snail in 17 provinces and municipalities of China with elimination (prevention and control) of invasion of alien species in 2.41 million ha. The authority has finished national investigation on the invasion of 18 major alien species including *Eupatorium adenophorum* and improved national database on invasive alien species. The authority has developed technical specifications for monitoring and early warning of 10 invasive alien species such as *Flaveria bidentis* and *Mikania micranth*.

**【 Study on China's Strategy for Environment and Health 】** The Study on China's Strategy for Environment and Health has primarily developed the strategic framework of China on environment and health by 2050; analyzed the

### Investigations on Public Satisfaction Status about the Environment

In order to understand public understanding about environmental status and its change trend, Ministry of Environmental Protection organized the "Investigation on Public Satisfaction Status about the Environment" across the country in 2009.

The current investigation involves the suggestions of experts from such fields as environmental science, psychology, sociology and statistics and the findings of past investigations on public in the field of environmental protection. With the help of such major approaches as expert workshop, questionnaire, data input, systematic design, trial investigation, investigation and analysis, about 500 student volunteers from over 40 universities and colleges were mobilized to carry out questionnaire investigation on about 6,000 urban and rural residents in 30 provinces (autonomous regions and municipalities) except Hong Kong, Macao, Taiwan and Xinjiang.

55.6% subject residents in the current investigation said they are "satisfied" or "relatively satisfied" with current environmental situation. The subject residents were most satisfied with the quality of drinking water with lowest satisfaction with noise in rural areas and garbage treatment in rural areas. In general, the satisfaction of rural residents with the environment status was lower than that of urban residents, in particular garbage treatment and quality of drinking water. The subject residents in Northeast China had the highest satisfaction about environmental status, while those in North China had the lowest satisfaction with environmental status.

In terms of improvement of environmental status, 65.8% urban participants and 57.9% rural participants said they are "satisfied" or "relatively satisfied". The public in Northeast China have the highest satisfaction on the overall improvement of environment. Public satisfaction with the environment in Southwest China ranked No.2. The subject residents in North China had the lowest satisfaction with environmental status.

This investigation also had open questions that received 741 effective answers. The analysis on the answers to these open questions found that public comments & suggestions are mainly focused on the following areas: more attention should be made to environmental protection while promoting economic & social development; monitoring and supervision on environmental quality should be further enhanced with further enhancement of environmental management.

history and current status of environment and health issue; studied the cause of imbalance between environment & health management level and socio-economic development in China; and analyzed the experience and lessons of major countries and regions in the world in addressing health problems due to environmental pollution. With full consideration of national

conditions, the study has put forward the philosophy on adjusting environment and health work that adapts to future social, economic and environmental development of China, including the goal, focus and implementation procedures of China's strategy on environment and health by 2020, 2030 and 2050 and corresponding institutional policy recommendations.

### National Investigation on Soil Pollution

MEP and Ministry of Land and Resources have conducted special activity on investigation of current status of soil and prevention and control of soil pollution across China since 2006 according to the arrangement of the State Council. At present, each province, autonomous region and municipality is reviewing and analyzing the data.

By the end of 2009, 180,000 soil and agricultural produce samples from 65637 sites had been collected and tested, generating over 4.7 million measuring data, 2.05 million piece of field data on environmental information and more than 10,000 figures. A total of over 15000 person-times have been subject to training. It is expected that the completion of the project will help understand current status and scope of soil pollution in China, main pollutants and pollution extent and will lay a solid foundation for environmental management of soil in China.

### Environmental Publicity and Education

In 2009, centering on core task and big picture of environmental protection, environmental publicity and education workers have expanded their thinking, worked hard and created a good atmosphere for smooth progress of environmental protection activities.

Ministry of Environmental Protection, CCCPC Publicity Department, and Ministry of Education have jointly issued the Suggestions on Doing Well Environmental Publicity and Education under New Situation. It clearly called for the development of the big picture of vigorous and effective publicity and education work for environmental protection which is dominated by the government and smooth in operation with cooperation of all stakeholders, and made comprehensive arrangements for the objectives, tasks and guarantee measures of environmental protection publicity and communications under the new situation, unified awareness and identified the future direction.

With full utilization of various news report resources, Ministry of Environmental Protection has made overall arrangements of such media as TV, newspapers and network and has elaborately organized the series reports on "ecological rehabilitation of rivers and lakes" and in-depth reports on the achievements of comprehensive environmental pollution control in "manganese triangle". It has made good arrangements for the reports of 51 important meetings including the 13th World Lake Conference, 35 important meetings in MEP headquarters and 44 foreign activities. Centering on the hot and common topics in media and society, it released news reports. With active utilization of important publicity platform, Ministry of Environmental Protection has organized topic news conferences and provided strong support to the promotion of environmental protection cause. According to estimate, 855 reports on environmental protection were published or aired by 16 media at national level, 89 of which were reported by the People's Daily, 162 by Xinhua News Agency and 192 by CCTV.

MEP has conducted publicity for June 5 World Environment Day and carried out a series of activities including the June 5 World Environment Day — Launching ceremony for 10,000 Youth Environment Ambassadors, and "June 5 World Environment Day Special Forum — Exploring the New Path to Environmental Protection". It has finished the environmental protection exhibition for 60th anniversary of National Day with flying colors.

# Land and Rural Environment

## General Situation

Current total area subject to water and soil erosion is 3.5692 million km<sup>2</sup>, taking up 37.2% of total land area. Among them, 1.6122 million km<sup>2</sup> are subject to water erosion, accounting for 16.8%; 1.957 million km<sup>2</sup> subject to wind erosion, taking up 20.4% of total land area.

### Rural Environmental Status

At present, rural environmental problems are increasingly pre-eminent and they pose severe challenges. It is mainly reflected by such facts as weak infrastructure for treating rural domestic pollution, worsening non-point pollution, prominent industrial and mining pollution, shift of pollution from cities to rural areas and no effective control of ecological degradation in rural areas.

The nationwide rural drinking water improvement program has benefited a total of 903 million people; including 654 million people having access to tap water, accounting for 72.4% of the total; 165 million people getting access to manual pumped wells, accounting for 18.3%; 84 million people getting access to other forms of safe drinking water facilities, taking up 9.3% of the total. The rural residents benefiting from drinking water improvement program accounted for 94.3% of the total rural population.

## Measures and Actions

**[ Main contents of the Implementation Program on the Acceleration of Addressing Prominent Rural Environmental Problems by Employing Award Approach ]** The General Office of the State Council transmitted the Circular of Ministry of Environmental Protection, Ministry of Finance and NDRC on the Implementation Program on the Acceleration of Addressing Prominent Rural Environmental Problems by Award Approach

in February of 2009, which has made clear the overall requirements, basic principles, objectives, implementation scope, contents and achievement requirements of the “employing award to facilitate pollution control” policy. It also puts forward specific requirements for implementation procedures, supervision and examination and makes clear the responsibility of local governments and work division among their different departments. It is a programmatic document that guides “employing award to facilitate pollution control” activities.

**[ Main contents and implementation of the Provisional Measures on the Management of Special Fund for Rural Environmental Protection from the Central Budget and Provisional Measures on the Management of Comprehensive Environmental Control Project Financed by Special Fund for Rural Environmental Protection from the Central Budget ]** Ministry of Finance and Ministry of Environmental Protection had printed out and distributed the *Provisional Measures on the Management of Special Fund for Rural Environmental Protection from the Central Budget* and *Provisional Measures on the Management of Comprehensive Environmental Control Project Financed by Special Fund for Rural Environmental Protection from the Central Budget* in April of 2009. The two Provisional Measures stipulate that the villages carrying out comprehensive environmental control project shall be encouraged by financial award, and those meet eco environment criteria through environmental efforts shall also be awarded financially to replace the subsidies they used to receive. Meanwhile, whole-process management has been conducted for the Special Funds with establishment of five mechanisms and five systems based on characteristics of rural areas. The five mechanisms are the followings: 1) guidance by the central government and promotion by local government; 2) institutional innovation that promotes synergy across all levels of government; 3) highlight the focus and suit measures to local conditions; 4) Make clear the responsibility and strengthen supervision; 5) openness and transparency and performance tracking. The five systems include responsibility system, reporting and recording system, rural resident public participation system, making public system and county-level finance reimbursement system.

**[ Monitoring water quality of safe rural collective**

**drinking water project ]** According to the Program on Monitoring of Water Quality of Safe Rural Drinking Water Project jointly developed by Ministry of Health, NDRC and Ministry of Water Resources, Ministry of Health organized water quality monitoring of rural collective safe drinking water projects. In 2009, monitoring of rural collective safe drinking water project was integrated in the national key public health service program (and deepening medical reform). The central government had subsidized 48 million yuan to local governments for environmental monitoring, local financial department at all levels provided over 30 million yuan supporting fund.

In 2009, patriotic health campaign committee and disease prevention and control center at all levels monitored the sanitation and water quality of 28060 projects in 1650 counties (cities or districts) of 29 provinces (autonomous regions and municipalities) (Shanghai has achieved unified water supply for both urban and rural areas, no data for Tibet) and Xinjiang Production and Construction Corps. A total of 111502 data on valid water samples during both dry and wet seasons were reported, 98.2% of them were subject to the review of provincial authority, 98.3% of them had complete 20 testing indicators, obtaining over 4 million valid monitoring data. The monitoring helps us understand the quality and sanitation of rural collective safe drinking water project, provide reliable bases for preventing and controlling water-born disease and responding to sudden health accidents due to drinking water, which have provided technical support to the scientific decision making and development of relevant plan by relevant government departments.

**[ Progress of comprehensive environmental control in rural areas ]** Comprehensive environmental control in rural areas has obtained evident achievements since the implementation of the policy of “employing award approach to facilitate pollution control”. The input in special fund for rural environmental protection from the central budget reached 1.5 billion yuan during 2008 ~ 2009, which supported 2160 comprehensive environmental control and demonstration on ecological development in 2160 villages and towns, drove local investment of 2.5 billion yuan with over 13 million rural residents getting direct benefit. A number of prominent environmental problems with strong public complaints have been addressed. The outlook of many villages has enjoyed evident improvement. Some projects have achieved the harmony among ecology, social benefits and economic growth. The “employing award approach to facilitate pollution treatment” policy has effectively improved rural environmental quality and raised the level of rural environmental protection.

#### **[ Rural toilet reform project in National Key Program**

**on Public Health Services ]** The construction of hazard-free sanitary toilets and environment-friendly treatment of human waste in rural areas are an effective way to reduce environmental pollution by human waste. China has launched the rural toilet reform project since 2004 to support local governments to construct environment-friendly toilets. According to statistics, 63.1% of rural households got access to sanitary toilets and 40.4% got access to environment-friendly toilets by the end of 2009. Rural toilet reform project was included in the National Key Program on Public Health Services in 2009, 1.5665 billion yuan from central budget were allocated to construct 4.11 million environment-friendly toilets in 30 provinces (autonomous regions and municipalities) and Xinjiang Production and Construction Corps except Shanghai.

**[ Biogas project in rural areas ]** A total of 8 billion yuan were invested in rural biogas projects. Among them, the Central Government supported the development of biogas facilities for 3.58 million households, 1579 large and intermediate biogas projects, 10440 biogas projects in livestock and fowl farms and collective household employed the central budget. Over 5.1 million rural households had newly constructed biogas pit in the whole year. A total of 35 million households get access to biogas across China with annual production of biogas at about 13.4 billion m<sup>3</sup>. The biogas employed by rural residents was equivalent to 21 million t coal, or reduction of about 50 million t carbon dioxide.

**[ Control of water and soil erosion ]** In 2009, China had finished the prevention and control of water and soil erosion in 75000 km<sup>2</sup> with 3200 small watersheds under such control. Focusing on West China such as the mid and upper reaches of the Yangtze River and Yellow River, upper reaches of the Pearl River and all rivers in Southwest China with consideration of other regions with serious water & soil erosion including black soil areas in Northeast China, national key water & soil conservation projects have finished comprehensive control of water & soil erosion of 21000 km<sup>2</sup>.

**[ Extension of water conservation in agriculture and development of ecological irrigation areas ]** By the end of 2009, a total of 39.049 billion yuan were invested in the follow-up supporting and water saving reform projects in large irrigation areas, 21.578 billion yuan of them were from the central government, continuous supporting projects and water saving reform projects in 416 irrigation areas from 434 large-scale irrigation regions were conducted. As a result, there were 1.306 million ha of new irrigation area and 4.977 million ha farmland had improved irrigation conditions. Water utilization coefficient of key canals in the irrigation areas went up from 0.49 to 0.53 with annual additional conservation

of 12.6 billion m<sup>3</sup> water and new grain productivity of 10.7 billion kg, showing evident economic benefits. According to the “findings of mid-term assessment” of large irrigation areas, 90.6% of the project irrigation areas achieved more than 20% reduction of disaster losses with estimated total reduction of economic loss of 3.2 billion yuan. The water transfer capacity of irrigation canals enjoyed clear increase thanks to the supporting and reform project of risky sections. The irrigation cycle of project beneficial areas went down by 21.1% on the average. There is remarkable reduction of canal failures after reform project of irrigation areas. 67.8% of the irrigation areas under the assessment enjoyed over 50% reduction of losses due to failure. 54% of the newly saved water in the project beneficiary areas was used for expansion of irrigation areas and improve irrigation guarantee rate; 16.1% of such water was employed for urban and industrial supply, and 30.1% of such water for improvement of eco environment. The implementation of follow-up supporting and water saving projects in large irrigation areas has not only guaranteed the water demand for irrigation, but also eased increasing pressure of water supply to urban residents and

industry in some irrigation areas, where the environment has also been improved.

**【 Rural clean-up project 】** In 2009, the central government allocated 10.325 million yuan financial fund to support the demonstration project on clean villages in 112 villages of 17 provinces (municipality) such as Hunan, Hubei, Anhui, Sichuan and Chongqing. 11.58 million yuan provincial fund and 77.08 million yuan (including private fund raised by farmers) self raised fund by county authorities were employed for the development of rural clean project. With the development of clean countryside, clean homeland and village public clean facilities, the demonstration villages conduct environment-friendly treatment and reuse of human & livestock waste, garbage, sewage and straw. The demonstration area has constructed 17900 m of environment-friendly ditch, 1507 rural waste fermentation pits, 2653 sewage purification & treatment pools, 206000 m of in-village pipeline and network, 213767 m of road, rural “Sigai” supporting facilities for 8784 households, classified garbage collection facilities for 14557 households, 123 rural property management stations, 411 transfer facilities for inorganic garbage.

### Severe and Major Environmental Pollution Accidents

In 2009, Ministry of Environmental Protection received the report and properly handled 171 sudden environmental accidents, up by 26.7% compared with that of the last year. Among them, 2 were very severe sudden environmental accidents, 2 were severe sudden environmental accidents, 41 were relatively severe sudden environmental accidents and 126 general environmental accidents.

Classification by cause: 63 were due to production accidents, taking up 36.84%, up by 6 compared with that of the last year; 52 were due to traffic accidents, accounting for 30.41% of the total, up by 27 compared with that of the last year; 23 were due to pollution discharge by enterprises, accounting for 13.45%, same as that of the last year; 33 were due to other factors, accounting for 19.30%, up by 3 compared with that of the last year.

Classification by pollution types: 80 were water pollution accidents, 61 were air pollution accidents, 3 solid waste pollution accidents, 16 soil pollution accidents, 2 marine pollution accidents and 9 other types of environmental pollution accidents.

## National Special Campaign on Environmental Protection

Focusing on striking environmental problems threatening public health and affecting sustainable development, nine national departments including Ministry of Environmental Protection, NDRC, Ministry of Industry and Information Technology, Ministry of Supervision, Ministry of Justice, Ministry of Housing and Urban-Rural Development, State Administration for Industry and Commerce, State Administration of Work Safety and State Electricity Regulatory Commission had conducted special environmental protection campaign across the country during April ~ November of 2009. A total of more than 980,000 enterprises were under inspection with over 10,000 environmental infringements under investigation. As a result, 744 enterprises had been banned or shut down, 841 enterprises stopped operation for corrections and 810 enterprises ordered to make corrections within a given period of time. A total of 2587 cases across China were on the list for supervised rectification. The responsibilities of 119 people were under investigation by supervision institutions at all levels according to law. The industry and commerce department has revoked the business license of 806 enterprises with high energy consumption & pollution or resource oriented. A total of 3177 drinking water source protected areas were under inspection; 287 enterprises in Grade I protected area have been banned or shut down, which had 220 direct outlets; 444 enterprises in Grade II protected area have been banned or shut down and 780 illegal building structures have been demolished. A total of 1959 urban sewage treatment plants that have been put into operation have been checked with total design capacity at 104.41 million m<sup>3</sup>/d, the actual daily average treatment amount was 78.31 million m<sup>3</sup> with average operational load at 75%. The COD, ammonia nitrogen and TP of out-flowing waste water of 84.7% sewage treatment plants could meet pollutant discharge standard. Environmental protection authorities have inspected 1266 iron & steel enterprises (excluding coking and rolling mills) and checked 1576 furnaces or converters and 1714 electric furnaces. In 2009, 120 blast furnaces had stopped operation with total capacity at 10.26 million t. 79 converters and electric furnaces had stopped operation with total capacity at 5.33 million t. A total of 1312 sintering furnaces were checked, 118 of them have installed with desulphurization facilities and 116 of them were installing such devices. Environmental authorities have inspected 1296 enterprises that produce or utilize arsenic. 304 such enterprises with environmental infringements have been subject to sanctions according to law. Among them, 36 were banned and shut down, 150 were ordered to make corrections within a given period of time and 98 enterprises stopped operation for making corrections. In the second half of 2009, there was evident reduction of arsenic related pollution accidents across the country. A total of 9123 heavy-metal enterprises were inspected. 2183 such enterprises with environmental infringements were investigated and sanctions according to law. Among them, 231 enterprises were banned or shut down and 641 enterprises stopped operation and made corrections.

# Forest

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## General Situation

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China has vast land, a great deal of rivers and lakes; crisscross mountains, complex & diversified landscape; three-dimension difference of water and heat conditions, thus forming complex natural geographical environment with forest resources rich in biodiversity and types of vegetation. According to the findings of the 7<sup>th</sup> National Investigation on Forest Resources (2004 ~ 2008), forest area in the mainland of China is 195.4522 million ha, representing a forest coverage of 20.36%. The total growing stock was 14.913 billion m<sup>3</sup>, forest reserve was 13.721 billion m<sup>3</sup>. The arbor forest reserve was 85.88 m<sup>3</sup> per hectare. The annual average net growth of woods was 572 million m<sup>3</sup>, with annual average logging at 379 million m<sup>3</sup>. Compared with the findings of the 6<sup>th</sup> National Investigation on Forest Resources (1999 ~ 2003), there was a net increase of 20.5430 million ha in forest area, 0.013 ha in per capita terms, 2.15 percentage points in forest coverage, and 15.64 percentage points up in the percent of forests for public welfare against the total.

**Plant Diseases and Insect Pests** The plant disease and insect pest in forestry of China in 2009 was heavier than that of normal years with serious disasters in some areas. 11.571 million ha forest across China was subject to plant diseases and insect pests, 907000 ha of them were subject to serious plant diseases and insect pests with some increase compared with that of the last year. Among them, 8.585 million ha were subject to insect pests, 1.071 million ha subject to plant diseases, 1.915 million ha plagued by rats and rabbits. In addition, there were 149000 ha hazardous plants. A total of 8.198 million ha forests across China had prevented and controlled plant diseases and insect pests, 6.711 million ha forest was subject to hazardous-free prevention and control.

**Forest Fire** There were 8859 forest fires in 2009, down by 1666 cases compared with the average of the past three years with a drop of 15.8%. Among them, 4945 were ordinary fires, 3878 relatively big fires, 35 big forest fires and 1 very big fire. A total of 46155.9 ha forest were subject to fires, down by 117204.1 ha compared with the average of the past three years, a reduction at 71.7%. There were 110 casualties in

forest fires, including 39 deaths.

In 2009, forest fire frequency (fire per 100,000 ha) was 4.53; forest fire control rate (amount of hectares of victim forest per fire) was 5.21 and forest fire victim rate (area of victim forest/total forest area) was 0.236%.

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## Measures and Actions

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**[ Forestry policy ]** Keep on the improvement of compensation system for forest ecological benefits. Relevant authority has promulgated the *Measures on the Identification of the Boundary of National Public Interest Forests*, *Measures on the Management of Forest Ecological Benefit Compensation Fund from Central Budget* and *Measures on the Management of Forests for Public Welfare* in 2009. Both the major forests for public interests in the project area beyond natural forest protected areas and new forests in natural forest protected areas were included in the compensation program with an increase of 23.333 million ha under the compensation program. A total of 1.75 billion yuan was added in the compensation fund. The authority has facilitated the trial on subsidy for the cultivation of forest composed of middle-age and young trees. A total of 500 million yuan forest cultivation subsidy was in place. Trial has been conducted in 12 provinces and forestry corporations with 333000 ha under trial and 1500 yuan subsidy for each hectare. There is major breakthrough in forestry financial policy. A total of 18 million ha forest bought insurance with amount insured of 114.1 billion yuan. The ownership of 3.62 million ha forest had been mortgaged, obtaining 21.7 billion yuan loan. Forestry loans of all financial institutions totaled 24 billion yuan. 16 billion yuan forestry discount loan was in place, the discount fund from central budget was 650 million yuan. There has been a big adjustment in the policy on forest tax and fees. The authority has promulgated the new *Measures on the Management of Collection and Use of Forest Fund*. Thus, the expenditure from forest fund by forestry department in the past will be included in the financial budget of the government at the same level. Hunan Province has

integrated in full the administration fee of forestry department into financial budget.

**【 National key forestry projects 】** In 2009, national key forestry projects had finished afforestation of 4.5962 million ha, taking up 73.39% of total afforestation area, the afforestation area by other social stakeholders took up the rest 26.61%.

Natural forest conservation project has finished the development of 1.3609 million ha public welfare forests. Among them, 282,000 ha were by labor and 153300 ha by airplane. A total of 925,600 ha of new mountain slopes without or with sparse trees were closed to facilitate afforestation. The Grain for Green Project had finished afforestation of 898600 ha (including 12000 ha in the project on the control of sand & dust sources to Beijing and Tianjin) forests. Among them, 700 ha arable land were restored to forest, 576700 ha barren hillside were planted with trees, 321200 ha new hillsides without or with sparse trees were closed to facilitate afforestation. A total of 434800 ha land had finished the treatment in the project on the control of sand & dust sources to Beijing and Tianjin. Among them, 130400 ha forest were by labor and 73000 ha forestation by aerial sowing. 231400 ha new hillsides without or with sparse trees were closed to facilitate afforestation. The Sanbei shelter forest project and Yangtze River basin shelter forest project had finished afforestation of 1.8931 million ha. Among them, 1.6186 million ha afforestation were by labor, 274500 ha new hillsides without or with sparse trees were closed to facilitate afforestation. The projects on the development of fast-growing timber forest bases in key areas had finished afforestation of 26900 ha, among them, 20800 ha were barren land and hillsides, 5200 ha were renewed forests and 900 ha forest on non-forestry land.

**【 New forest laws and regulations 】** China has promulgated the *Law of the People's Republic of China on the Mediation and Arbitration of Rural Land Contract Disputes*, the newly amended Regulations on the Prevention of Forest Fire has been officially promulgated. State Forestry Administration and Ministry of Agriculture have jointly issued the Regulations on the Arbitration of Rural Land Contract Disputes and Regulations on the Demonstration of Rural Land Dispute Arbitration Committee. Relevant regulations on the mediation and arbitration of rural land contract disputes have made clear the mediation mechanism for the disputes of collective forest ownership. Liaoning Province has promulgated the regulations on the prevention and control of sand. Fujian Province has promulgated the regulations on the registration of forest ownership. Gansu Province has promulgated the regulations on the protection of forests. Hunan Province has issued the guiding principle

for standardization of the exercising discretion right of administrative sanction in forestry. Hainan Province has developed the guiding principle for the development and protection of coastal shelter forests.

**【 Development of ecological culture system 】** The organizational system has enjoyed continuous improvement. There has been continual emergence of various kinds of ecological culture (conservation culture) associations, societies, promotion associations and creation bases. Ecological culture management, study, creation and publicity workforce have been continuously growing. China Ecological Culture Association has set up such branches as forest culture branch, flower culture branch, famous mountain culture branch and wetland culture branch. There were 51 new, reformed or expanded ecological culture sites; 143 ecological culture recreation sites and 29 ecological culture education centers. China Wetland Museum and China Exhibition Hall of Grain for Green have been set up. Ten organizations including Hunan Forest Botanical Garden won the title of "National Base for Ecological Culture Education". China Tree Exposition, wildlife museum and forestry exhibition hall and so on have been established in [www.chinaforestry.com.cn](http://www.chinaforestry.com.cn), which serve as the ecological culture platform that integrates such functions as protection, exhibition and education. Ecological culture becomes more and more popular. Main newspapers and broadcasting stations at national level have published or aired 13000 pieces of news or reports on forestry and ecology. State Forestry Administration has carried out the development of national forest cities, and Hangzhou, Weihai, Baoji, and Wuxi won the title of "National Forest City". The Sixth China Urban Forest Forum and the Second High-Level Forum on the Development of Ecological Culture in China have been held with flying colors. The selection of "Top 10 Outstanding People for Eco China", national contest on ecological literature works and Ecological Footprint—National Photo Contest on the Achievement of Ecological Development have been held.

**【 Forestry reform 】** The central government held national forestry meeting in June of 2009 to study and arrange the reform of collective ownership of forests. The reform of collective forest ownership system has made significant progress with the strong push of the forestry meeting. 101 million ha forest across China has finished the reform of ownership, taking up 59.4% of collective forests. The total area covered by forest ownership certificates was 76 million ha, taking up 44.6% of total collective forest area. The system where forestry development is supported by public finance has enjoyed gradual improvement with effective progress in rural forest financial activities. There has been a breakthrough in reforming logging management mechanism for forests

with collective ownership. The flow of forest ownership has been subject to gradual standardization. The development of farmer forestry professional cooperation organizations has been launched. Trials on the reform of management mechanism for logging were carried out in 193 units from

24 provinces (autonomous regions or municipalities). The system of making public the logging indicator was carried out. In Hunan Province, the allocation of logging quotas was transparent with 100% of rural households and villages involved.

## Municipal Infrastructure Construction

**Urban parks and greening work** By the end of 2009, the greening area in urban built areas amounted to 1.494 million ha, and the green coverage had gone up to 38.2% from 37.4% last year; the area of parks in built areas had covered 1.337 million ha, and the coverage had gone up to 34.1% from 33.3% last year. Urban parks and green areas across the country amounted to 401,000 ha; and the per capita area of parks and green areas was 10.65 m<sup>2</sup>, up by 0.94 m<sup>2</sup> compared with that of last year.

**City appearances and environmental sanitation** In 2009, 4.46 billion m<sup>2</sup> of road surface was kept clean throughout the year, and 156 million t of municipal garbage and 21 million t of feces were cleared up and transported away. There were 562 environmentally sound municipal garbage treatment plants, with treatment capacity up to 347,000 t/day. 112 million t of municipal garbage was safely disposed of, taking up 71.6%. There were 118,430 public toilets and 83,701 environmental sanitation vehicles.

## Chemicals Management

### Review and approval of chemicals

Ministry of Environmental Protection issued the Circular on Strengthening Environmental Management and Registration of Import & Export of Toxic Chemicals in September of 2009, which has improved the review and approval procedures for chemicals. In 2009, Ministry of Environmental Protection had reviewed and granted 220 Registration Certificate for Environmental Management of Imported Toxic Chemicals, 198 of them were new, 18 were registration certificate with added amount and 4 with alteration. It had issued 3888 notifications on the clearance of import of toxic chemicals and 5350 notifications on the clearance of export of toxic chemicals involving 46 substance and 452 enterprises & institutions at home and abroad. The approved total imported amount was 1707220.7 t, up by 132.6% compared with that of the last year. The approved total amount for export was 277777.5 t, up by 61.6%, both on rising trend. Ministry of Environmental Protection has answered 100 export notifications to export destinations such as EU and Britain. It has approved the registration of 101 new chemicals and 3818 exempt applications of new chemicals and approved the inclusion of 76 kinds of chemical substances in China Inventory of Existing Chemical Substances.

### Investigation on POPs

Ministry of Environmental Protection had checked and accepted the 2006~2008 National Investigation on POPs. The project has understood basic situation of 25000 dioxin POPs emissions from 15,000 enterprises across China. It has understood waste pesticide POPs in the following four provinces such as Chongqing, Jiangsu, Jilin and Guangdong. It has carried out in-depth investigation and testing of pesticide POPs manufacturers and pollution sites across China. Ministry of Environmental Protection has further studied and developed overall strategy for the management of POPs and set up the screening principle and monitoring mechanism for major POPs pollution sources. It has conducted the nationwide renewal and investigation on POPs and launched the development of the "12<sup>th</sup> Five-Year Plan for the prevention and control of POPs at provincial level as well as "12<sup>th</sup> Five-Year Plan for the prevention and control of POPs of major industries in China. It has developed the Suggestions on Strengthening the Prevention and Control of Dioxin Pollution (Draft). MEP in cooperation with relevant departments has issued the circular on prohibition of production, circulation, utilization, import and export of DDT, chlordane, mirex and perchlorobenzene, which has banned the production, circulation, utilization, import and export of DDT, chlordane, mirex and perchlorobenzene as of May 17, 2009 in an all round way.

# Grassland

## General Situation

There are 400 million ha grassland in China, accounting for 41.7% of total land area. Grassland in arid and semi-arid areas in northern part of China involving 10 provinces (autonomous regions) such as Hebei, Shanxi, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Shaanxi, Gansu, Ningxia and Xinjiang totaled 159.9486 million ha. Grassland in Qinghai—Tibet cold plateau including Tibet, Qinghai, part of Sichuan, Gansu and Yunnan totaled 139.0845 million ha. Grassland in 10 provinces (municipalities) such as Beijing, Tianjin, Hebei, Shanxi, Liaoning, Jilin, Heilongjiang, Shandong, Henan and Shaanxi, which are in wet and semi-wet regions in Northeast China and North China, totaled 29.6082 million ha. Grassland areas in South China cover 15 provinces (autonomous regions and municipalities) such as Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Hunan, Hubei, Guangdong, Guangxi, Hainan, Chongqing, Sichuan, Guizhou and Yunnan were 64.1912 million ha of grassland.

**Grassland Productivity** In grass growing seasons of 2009, the air temperature of most regions of China was higher than that of normal years with precipitation less than

the historical average and drought in some areas, the overall growth of grassland vegetation was slightly poorer than that of 2008. Total output of fresh grass of natural grassland in China was 938.4086 million t, down by 0.92% compared with that of last year, the livestock carrying capacity was able to feed 230.9881 million sheep.

**Grassland Disasters** In 2009, there were 192 grassland fires across the country, affecting 25000 ha grassland, up by 15000 ha compared with that of 2008. A total of 40.872 million ha grassland suffered from rat, accounting for 10.5% of total area, up by 11.2% compared with that of 2008. 20.762 million ha grassland suffered from insect pest, taking up 5.3% of the total, down by 23.1% compared with that of the last year.

## Measures and Actions

**[ Key project on the protection and development of grassland ]** In 2009, the Chinese Government invested 1.5 billion yuan to keep on the restoring pasture land to grassland project in such regions as Inner Mongolia, Sichuan, Yunnan, Tibet, Qinghai, Gansu, Ningxia, Guizhou,

### Three-Year Action Plan for Management of Environmental Monitoring Quality

MEP has printed and distributed the *Three-Year Action Plan for Management of Environmental Monitoring Quality (2009-2011)* (hereinafter referred to as the Action Plan) in 2009.

From September to November 2009, MEP established inspection groups to inspect on the performances of the environmental protection bureaus of Shanxi Province, Liaoning Province, Jilin Province, Shanghai Municipality, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Henan Province, Guangdong Province, Chongqing Municipality, Sichuan Province, Yunnan Province and Shaanxi Province that have implemented the Action Plan and urged local environmental protection departments to pay high attention to the Action Plan. Local areas took actions, developed implementation plans, strengthened organization and leadership, worked harder on publicizing the Action Plan, adopted effective measures and inspected on the management of environmental monitoring quality within their administrative jurisdictions. As a result, the provinces, cities and counties assumed responsibilities at their own administrative levels and worked together to implement the Action Plan, enabling the management of environmental monitoring quality to be more standardized, normalized, institutionalized and scientific.

Xinjiang and Xinjiang Production and Construction Corps, Fence has been built in 5.257 million ha grassland; sowing had been conducted in 1.567 million ha grassland under serious degradation, 27000 ha grassland subject to stony desertification were under treatment. The central government had invested 360 million yuan from its budget. Beijing,

Inner Mongolia, Shanxi Province and Hebei Province have carried out the project on grassland treatment, which are the sources of sand & dust storms in Beijing and Tianjin. A total of 190,000 ha grassland had been treated, 1.27 million m<sup>2</sup> of livestock sheds had been constructed and 17100 sets of grass feed processing machines had been purchased.

### Major Progress in Environmental Economic Policies

In 2009, the State continued to advance the implementation of a host of environmental economic policies including green credit, green insurance, green trade and green taxation policies, enriched the macro control approaches and reduced the environmental costs for the economic growth.

The green credit policy was deepened. MEP and People's Bank of China printed and distributed the Circular on Implementing the Green Credit Policy in All Dimensions and Improving the Information Sharing, setting standards for the information sharing scope and information reporting manners. MEP provided China Banking Regulatory Commission with the updated information in 2009. More than 40,000 pieces of environmental information had entered the credit investigation management system of People's Bank of China. The commercial banks restricted, stopped or withdrew the loans to businesses in violation of environmental laws and regulations according to the information, and urged the businesses to treat their pollution and protect the environment.

Steady progress has been made in green insurance. In 2009, under the guidance of MEP and China Insurance Regulatory Commission, pilot projects on green insurance were conducted in whole or part of nine provinces and municipalities. A dozen of insurers introduced the environmental pollution liability insurance. Hebei Province, Shenyang City of Liaoning Province and Shanghai Municipality included the articles about environmental pollution liability insurance in the local environmental laws. The people's governments of Hunan Province and Kunming City of Yunnan Province issued their opinions on introducing this kind of insurance. Zhuzhou City of Henan Province reduced the pollutant discharge fees of the businesses which purchased environmental pollution liability insurances, the reduction being up to 50% of the premium concerned. This move made the businesses more active in purchasing such insurances.

The Catalogue of Products with Heavy Pollution and High Environmental Risks (2009) paved the way for implementing environmental economic policies. In 2009, MEP issued the Catalogue of Products with Heavy Pollution and High Environmental Risks (2009) (hereinafter referred to as the Catalogue), which covered over 290 kinds of products. Ministry of Finance and Ministry of Commerce adjusted the export rebate policy according to the Catalogue, playing an important role in curbing the export of these products and relieving the environmental pressure. State Administration of Work Safety and China Banking Regulatory Commission forwarded the Catalogue.

Green taxation policy was gradually improved. In 2009, Ministry of Finance, State Administration of Taxation and MEP continued with the development of the program on levying environment tax. The State issued the List of Environment-friendly and Energy-and Water-Efficient Projects Enjoying Preferential Enterprise Income Tax Policies (On Trial), giving preferential income tax policies to qualified enterprises engaged in five kinds of environmental projects, where were on municipal wastewater treatment, municipal garbage treatment, comprehensive development and utilization of methane gas, upgrading of energy conservation and emissions reduction technologies, and desalination of seawaters.

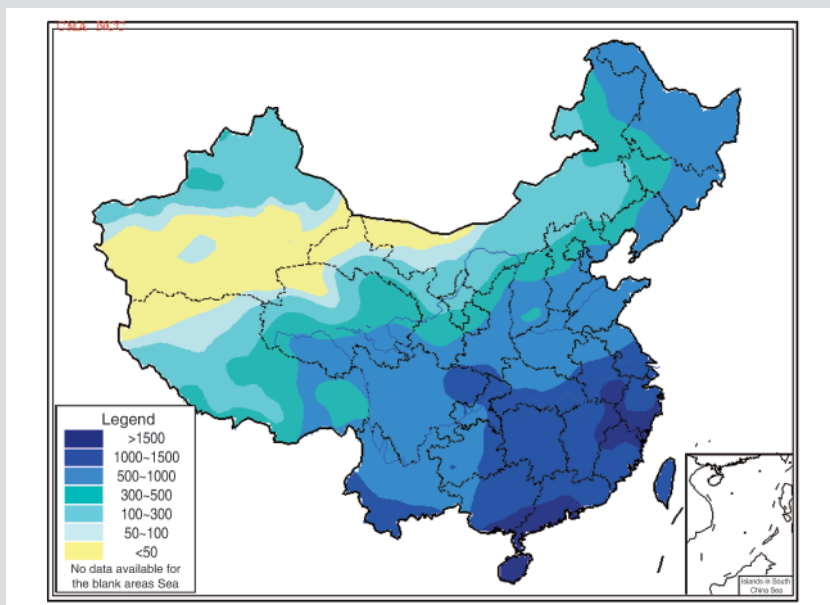
## Climate and Natural Disaster

### Climate Conditions

The annual average precipitation in 2009 was much lower than those in previous years. It was the fourth driest year since 1951 and the year with the lowest rainfalls since 1987. The precipitation in spring was about as much as those in previous years, while winter, spring, and summer recorded lower rainfalls, and winter saw much lower rainfall records. The annual average temperature in China was 1.0°C higher than those in previous years. The year 2009 was the fourth warmest year since 1951 and the 13<sup>th</sup> consecutive year recording higher temperature than those in previous years. The temperatures in the four seasons were on the high side. The average temperature in winter was the third highest and that in spring was the second highest since 1951.

**Precipitation distribution** The annual average precipitation in 2009 was 574.0 mm, 38.8 mm less than those in previous years. Most areas to the south of Yellow River, the

southern part of North China, and eastern and northern parts of Northeast China recorded rainfalls over 500 mm. Among others, the precipitation in southern part of Yangtze-Huaihe River area, most areas to the south of the middle and lower reaches of Yangtze River, eastern area of Sichuan Basin and southern area of Yunnan Province was 1000-1500 mm, and the rainfall in southern part of South China, northern part of Fujian Province, southern part of Zhejiang Province, and southeastern part of Anhui Province was 1500-2800 mm. Other areas in the country recorded rainfalls lower than 500 mm. The rainfalls in most areas of Heilongjiang Province and Qinghai Province, the southern part of Hebei Province, Shandong Peninsula, southern part of Jiangsu Province, and Hainan Province increased by 10%-50% compared with previous years; other parts of the country witnessed less or approximately the same rainfalls as previous years. Among others, the rainfalls dropped by 10%-50% in northern part of North China, southwestern part of Northeast China, central and western parts to the south of Yangtze River, southeastern part of the Southwest China, eastern part of South China,

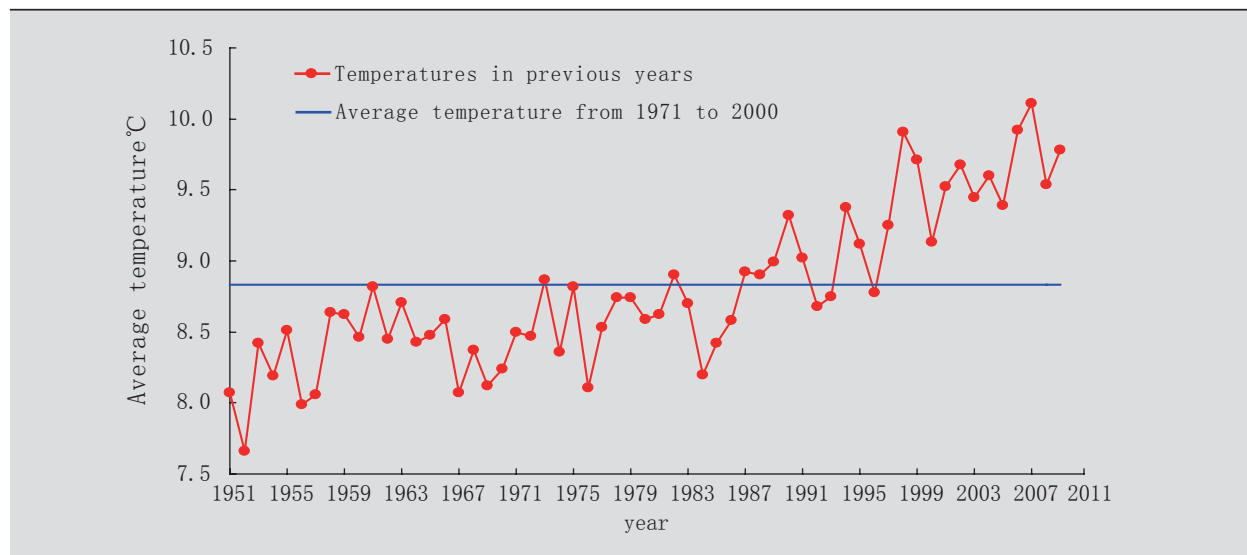


Annual Precipitation Distribution in China in 2009 (mm)

most areas of Guangxi Autonomous Region, southern part of Ningxia Autonomous Region, eastern part of Gansu Province, most areas of Xinjiang Autonomous Region, Tibet Autonomous Region, and Inner Mongolia. The rainfalls decreased by over 50% in some areas of Inner Mongolia, Xinjiang and Tibet.

**Temperature distribution** In 2009, the annual average temperature in China was 9.8°C, 1.0°C higher than those in previous years. Most areas of Heilongjiang Province and southern part of Hainan Province saw lower temperatures, but other areas in the country saw higher temperatures than that of previous years. Among others, the temperatures went up by 1-2°C in most areas of Northwest China, central

and western parts of Southwest China, northeastern part to the south of Yangtze River, and central and western parts of Inner Mongolia. Except Heilongjiang Province that experienced lower temperature than that of previous years, and Hainan Province with similar temperature, all other provinces (autonomous regions and municipalities directly under the Central Government) had higher temperatures than that of previous years. Yunnan Province and Tibet Autonomous Region recorded the highest temperature since 1951, and Guizhou Province, Sichuan Province, Chongqing Municipality and Qinhai Province registered the second highest temperatures of their own.



Annual average temperature graph in China (1951-2009)

## Natural Disasters

**Meteorological disasters** The meteorological disasters in 2009 were like the common years in China. The direct economic losses caused by stage-based serious droughts, extreme rainstorms (snowstorms) in some areas, gales and squall lines in local areas, low (high) temperature disasters in some areas, and frequent landed typhoons as well as their collateral disasters amounted to about 250 billion yuan, higher than the average value during 1990 ~ 2008. The death toll of these disasters was about 1,300, the least in nearly 20 years, including 43 lives claimed by typhoons, the least in nearly ten years. More than 47 million ha of farm crops were affected, higher than the average level in previous years. According

to the statistics on the area of farm crops affected by major meteorological disasters in China, drought was the dominant meteorological disaster, which affected about 30 million ha of farm crops, accounting for 62% of the total. Rainstorms and floods were second to droughts, affecting 16% of the areas. Strong winds and hail disasters ranked the third and low temperatures, frosts and snow disasters ranked the fourth.

—**Droughts** Droughts affected more areas in 2009 than those in previous years. They were much more serious than those in last year and on the high side this year. Stage-based and regional droughts were prominent. The winter wheat production areas in North China including Henan Province, Hebei Province and Anhui Province suffered from rare droughts lasting from the autumn to winter. South China and eastern areas of Southwest China experienced remarkable droughts during winter. Heilongjiang Province

and northeastern part of Inner Mongolia suffered from serious droughts in spring. The eastern part of Tibet recorded serious droughts in early summer. Liaoning Province, Jilin Province, and eastern part of Inner Mongolia registered serious droughts during summer and autumn. Hunan Province, Jiangxi Province, Guizhou Province, Yunnan Province, Guangxi Autonomous Region, and Guangdong Province saw droughts in autumn, which was rare in nearly 50 years.

—**Rainstorms and floods** Some areas in China witnessed frequent rainstorms and floods in 2009. The mainstream of the upper reaches of Yangtze River saw the most serious floods since 2004, and Taihu Lake recorded the highest water level since 1999. Some tributaries in Yangtze River, Yellow River and Pearl River watersheds had record extremely serious floods that has never been seen in history. Sichuan Province, Chongqing Municipality, and Yunnan Province saw serious rainstorms, mountain floods, mud and rock floods, and landslides. Nine typhoons landed in coastal areas in China. Twenty nine provinces (autonomous regions and municipalities directly under the Central Government) and Xinjiang Production and Construction Corps suffered from floods at all scales due to heavy rains. The floods affected 8,748,160 ha of areas, including 3,759,790 ha of disaster areas. 111 million people was affected with 538 deaths and 110 missing. 555,900 of houses collapsed, causing 84.596 billion yuan of direct economic losses. The total losses caused by floods were fewer than those in previous years, and the death toll was the least ever since the founding of the New China.

—**Strong convection weather** The year 2009 saw frequent strong convection weathers such as gales, hails, tornadoes, and thunderstorms and lightning strikes in some areas. More than 1,800 counties (county-level cities) in the country experienced hails or tornadoes. The hails were much more frequent compared with previous years, and the wind hails affected over 5 million ha of farm crops, causing over 37 billion yuan of direct economic losses. The wind disasters were the most influential and caused the most losses. The affected areas and economic losses of wind hails were on the high side compared with previous years.

—**Sand storms** North China saw sand storms during 0.9 day on average in the spring of 2009, 4.7 days less than those during the same periods in previous years. The spring of 2009 witnessed the least sand storms since 1954. There were a total of seven sand storms in northern part of China in the spring, including five sand storms and two sand blowing weathers. No strong sand storms were observed. The duration of sand storms in 2009 was about the same as that in 2003 and much shorter than the average value (13.3 times) from 2000 to 2008. It was the shortest in the recent decade.

—**Tropical cyclones** There were 22 tropical cyclones (the maximum wind force at the center  $\geq 8$ ) in northwest Pacific and South China Sea, fewer than those in previous years (27 on average). Nine of these cyclones landed at the coastal areas of South China, two more than that of previous years. A high proportion of these cyclones landed on coastal areas, the affected areas were concentrated and the cyclones followed complicated paths. They claimed 43 lives, the least since 1999, and the direct economic losses were about 19.1 billion yuan, much less than the average of the last decade.

—**High temperature** An average of 9.5 days in 2009 saw high temperature in China, 2.5 days more than that of previous years. China experienced continued high temperature at a large scale from June 23 to 27, when the temperatures in some areas registered a record high, including Hebei Province, Henan Province, Shandong Province and Xinjiang Autonomous Region (40 ~ 43°C), Anyang City in Henan Province (43.2°C), Xingtai City in Hebei Province (42.4°C), Chaocheng Town (41.8°C) and Weifang City (41.4°C) in Shandong Province. The middle and lower reaches of Yangtze River saw continued high temperatures from July 8 to 24, the average number of days with high temperature in this region was nearly twofold of those in the same periods of previous years, with many areas hitting or breaking the historical records of high temperatures. From August 15 to September 14, lingering high temperatures struck again the southern part of China. The average number of days with high temperature in the middle and lower reaches of Yangtze River and South China was threefold of those in the same periods in previous years and the most in the same period since 1956.

—**Foggy weather** Most of the central and eastern parts of China saw over ten foggy days in 2009. Among others, eastern part of Liaoning Province, southern part of Hebei Province, most areas of Shandong Province, Jiangsu Province, southern part of Anhui Province, northwestern part of Zhejiang Province, northern part of Jiangxi Province, western part of Hunan Province, southeastern part of Sichuan Province, eastern part of Guizhou Province, southern part of Yunnan Province, and Fujian Province recorded 20 to 40 foggy days, with some areas experiencing over 40 days of fog. The foggy days in most areas to the south of Yangtze River, Jiangnan Plain, eastern and southern parts of southwestern China, southeastern part of Northwest China, eastern part of Jilin Province, Jiangsu Province and Fujian Province decreased by 10 to 30 days compared with those in previous years, and the foggy days in some areas in Jilin Province, Sichuan Province, Fujian Province and Yunnan Province dropped by over 30 days. Foggy days mainly occurred in January, February, October, November and December.

—**Seismic disasters** Twenty four earthquakes measured at or

above Magnitude 5.0 at Richter scale hit China in 2009, and there were eight seismic disasters, which affected about 1.34 million people in the mainland China, claimed three lives, and injured 404 people. The affected areas amounted to about 25,248 km<sup>2</sup>. A total of 993,300 m<sup>2</sup> of houses were destroyed, 218,203 m<sup>2</sup> of houses were in havoc, 6,835,403 m<sup>2</sup> was moderately damaged, and 2,475,538 m<sup>2</sup> was mildly damaged, causing 2.738 billion yuan of direct economic losses.

**Geological disasters** China suffered from 10,446 geological disasters in 2009, which caused 809 casualties and about 1.77 billion yuan of direct economic losses. A special fund for prevention and control of extremely serious geological disasters was set up under the Central Budget, and the fund spent 800 million yuan throughout the year. Two hundred and nine would-be geological disasters were prevented, 14,000 people were relocated safely, and 160 million yuan of possible direct economic losses were avoided.

**Oceanic disasters** There were 132 storm surges, surfs and red tides in China in 2009, 33 of which became disasters. The oceanic disasters (including sea ice and *Enteromorpha prolifera*) caused 10.023 billion yuan of direct economic losses and 95 deaths (missing persons). There were 32 storm surges, eight of which became disasters and caused 8.497 billion yuan of direct economic losses and 57 deaths (missing persons); 32 disastrous surfs which caused 803 million yuan of direct economic losses and 38 deaths (missing persons). The disasters inflicted by sea ices were not as serious as those in previous years and caused 17 million yuan of direct economic losses. There were 68 red tides which caused 65 million yuan of direct economic losses and 16 salty tides. The disasters caused by *Enteromorpha prolifera* in Yellow Sea caused 641 million yuan of direct economic losses.

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## Measures and Actions

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**[ Meteorological services ]** The year 2009 saw successive serious meteorological disasters including extreme rainstorms in certain areas, stage-based serious droughts, strong winds and squall lines in some areas, frequent landed typhoons, and snowstorms in North China in early winter. The meteorological departments across the country worked harder on monitoring, pre-warning and forecasts, made arrangements in advance, gave close supervision, provided forecast on news ticker, tried to make the forecasts more accurate and timely, worked down-to-earth on meteorological forecasts throughout the year, and provided timely meteorological services for Party committees, local governments and relevant departments

at all levels to organize disaster prevention and relief and for the masses to avoid disasters and save themselves. With the vigorous cooperation and supports of relevant departments, meteorological services were provided for a series of major events, such as the celebration of the 60<sup>th</sup> anniversary of the foundation of New China in Beijing, the 24<sup>th</sup> International Universities' Games in Harbin, 11<sup>th</sup> China National Games in Jinan, the celebration of the 60<sup>th</sup> anniversary of the foundation of naval army, the one-year anniversary of Wenchuan earthquake, naval escort in Gulf of Aden, the drills on maritime search and rescue in 2009, and "Great Wall No.6" anti-terrorism drills.

**[ Emergency response to meteorological disasters and multi-department cooperation ]** The meteorological departments earnestly implemented the Law of the People's Republic of China on Emergency Response, constantly facilitated the development of the mechanism and systems for emergency response to meteorological disasters; organized many inter-ministerial consultations on holding regular meetings of liaisons from ministries for reporting the information on meteorological disasters; cooperated closely with Office of State Flood Control and Drought Relief Headquarters, enhanced the consultations on heavy precipitation and typhoons in watersheds, and worked together with relevant ministries under the State Council on emergency response and defended against the meteorological disasters. China Meteorology Administration initiated 16 emergency response actions and sent out 12 field working groups. Local meteorological departments sounded 3,640 alarms and 2,737 pre-warning signals, and more than 900 million person-times received pre-warning short messages through mobile phones. With the concerted efforts of local and central governments, the efforts on prevention and relief of meteorological disasters were quite effective, and the death tolls caused by such disasters especially typhoons throughout the year was the lowest in history.

**[ Thunder proof and disaster relief ]** In 2009, China Meteorological Administration adopted more measures on thunder proof and disaster relief, continued to implement the thunder proof projects for primary and secondary schools, and installed thunder proof facilities in 1,676 primary and secondary schools in 21 provinces (autonomous regions and municipalities directly under the Central Government). No student died of thunder strike in the country. The thunder proof in rural areas was also effective.

**[ Prevention and control of geological disasters in key areas ]** The third-phase project on prevention and control of geological disasters in key areas was basically completed in the Three Gorges Reservoir area. By the end of 2009, 490 sites of such projects had been completed in the Three Gorges

Reservoir area, including 255 projects on the prevention and control of landslips and landslides and 255 projects on reservoir banks. More than 20,000 people were relocated to safe places thanks to those projects. Professional monitoring had been provided on 251 sites with potential geological disasters, and mass monitoring and control system had been introduced to 3,049 such sites. In the earthquake-struck areas in Sichuan Province, Shaanxi Province and Gansu Province, surveys were conducted on 1,965 sites with high risk of geological disasters. These surveys involved over 930,000 people. The projects for treatment of potential troubles in 314 sites were also completed, sheltering over 210,000 people. Relocation was completed in 1,999 sites with potential troubles, and more than 140,000 people were relocated to safe areas.

**【 Basic survey, monitoring and pre-warning for geological disasters 】** The surveys and zoning of geological disasters in 1,640 counties (county-level cities) were completed. Investigations on geological disasters in the mountainous areas in southwest China, the Loess Plateau in northwest China, and the mountainous areas in Hunan Province, Hubei Province, and Guangxi Autonomous Region were also carried out. Demonstration projects on monitoring and pre-warning of geological disasters were conducted in over ten areas, including Baota District of Yan'an City and Ailao Mountain area in Yunnan Province. The ministry-province information systems for mass monitoring and prevention of geological disasters were connected for the first time. Efforts were made to develop all necessary resources and capacity for monitoring and preventing geological disasters in all relevant counties. Drills on the comprehensive emergency response technologies for geological disasters were conducted for the first time. A multi-department drills on comprehensive emergency response technologies for geological disasters were held in Banyan Mountain in Huangshi City, Hubei Province, through comprehensive technologies such as portable monitoring stations, unmanned small airplanes, airship and 3D laser scanners.

**【 Drought relief and search for water sources 】** Ministry of Land Resources (MLR) issued the Emergency Notice on Providing Good Services for Drought Relief and Search for Water Sources on February 10, 2009, demanding local land resources departments to give full play to their advantages in expertise and provide technological supports and data for drought relief and drilling wells. MLR also developed the Action Plan of Ministry of Land Resources for Emergency Response to Droughts, providing drought-struck areas and relevant departments with geological data such as groundwater distribution map, urban emergency water sources distribution map, and distribution map of areas suitable for

drilling wells, as well as technological services for drought relief and drilling wells. MLR dispatched hydrological and geological experts to areas suffering from severe droughts, such as Hebei Province and Henan Province, to provide guidance for drought relief and for drilling wells as water sources, develop reasonable action plans for drought relief according to local hydrological and geological conditions and the distribution of groundwater, and identify in a scientific manner the suitable locations of wells. They mobilized over 40 drilling machines to drill wells in Shunping County of Hebei Province and Yiyang County of Henan Province, and nearly 50 wells were drilled in Hebei Province, Shandong Province and Henan Province.

**【 Flood control and emergency response 】** Before the flood season came in 2009, Ministry of Water Resources organized a national videoconference on ensuring the safety of reservoirs during flood seasons, and made sound arrangements for flood control throughout the year; inspected on the flood prevention work in key areas, developed and amended relevant plans, and perfected the systems. The State invested 17 billion yuan in reinforcing damaged and dangerous reservoirs. Office of State Flood Control and Disaster Relief Headquarters and Ministry of Water Resources organized 22 emergency responses to flood control and drought relief according to national contingency preparedness plan for flood control and drought relief, held 13 video consultation meetings out of Beijing, and worked with possibly vulnerable provinces (autonomous regions and municipalities directly under the Central Government), civil affairs departments and financial departments to make arrangements for disaster relief. It was estimated that over 34,000 reservoirs in China were involved in flood control and diversion, controlling more than 30 billion m<sup>3</sup> of flood water, protecting over 1.5 million ha of farmlands and 40.40 million people from floods, and reducing direct economic losses by 18.5 billion yuan.

**【 Establishing earthquake monitoring, preparedness and emergency response systems 】** Efforts were made to establish and operate five regional centers for automatic and rapid reporting of earthquakes and one national center for copies of automatic and rapid reports on earthquakes, expanded the earthquake database, and enhanced the capacity for data sharing. Efforts were also made to print and distribute the Rules of Implementation for the Accreditation and Administrative Licensing of Entities Qualified for Earthquake Safety Evaluation, and consider and adopt the earthquake safety evaluation results of over 180 major projects. Provincial earthquake departments considered and adopted the earthquake safety evaluation results of over 2,250 major projects. Relevant departments organized the mapping of the current national earthquake distribution areas, initially

adopting the plan for dividing potential seismic sources in China, and issued Notice on the Principles for Determining the Requirements for Earthquake Proof and Prevention of Construction Projects in Populous Sites such as Schools and Hospitals and Guidelines for Building Earthquake-proof and Safe Housing in Primary and Secondary Schools in China. Xinjiang Autonomous Region, Sichuan Province, Gansu Province, and Yunnan Province built or updated over 2 million earthquake-proof rural households. Efforts were made to organize the earthquake emergency response drills and popularization of earthquake relief knowledge on the first National Disaster Prevention and Mitigation Day. Efforts were also made to implement the Law of the People's Republic of China on Protecting against and Mitigating Earthquake Disasters, and issue six national standards including Guidelines for Community Volunteers on Earthquake Emergency Response and Rescue and six earthquake industrial standards including Methods for Surveying and Prospecting of Active Fault and make amendments to National Earthquake Contingency Plan. There had been more than 27,000 earthquake contingency plans at all levels in China by the end of 2009. On November 14, 2009, UN Office for the Coordination of Humanitarian Affairs (OCHA) granted the qualification certificate to China International Search & Rescue Team (CISAR) as international heavy-duty rescue team under UN. Twenty provinces in China opened the hotline for earthquake preparedness and disaster relief, sending out about 200,000 short messages on earthquakes.

**【 Management of emergency response to marine disasters 】** State Oceanic Administration intensified the management of the emergency response to marine disasters,

amended the Contingency Plan for Storm Surges, Surfs, Tsunami, and Sea Ice, and established systems such as leaders in charge during emergencies, staff 24-hour on duty during emergencies, accountability of the accidents, consultations on expertise, consultations on administrative commanding, and wrap-up of emergency management work. In 2009, marine forecast departments at all levels provided information on pre-warning of marine disasters on a timely basis, sounded alarms for and reported on marine disasters for over 2,100 times, and sent out more than 3.2 million pieces of mobile text messages and over 110,000 faxes and telegraphs.

**【 Forestry carbon sink 】** State Forestry Administration (SFA) set up the Management Center for “Asia-Pacific Network for Sustainable Forest Management and Rehabilitation” in April 2009, in response to the proposal of President Hu Jintao on establishing “Asia-Pacific Network for Sustainable Forest Management and Rehabilitation”, enhancing the cooperation and communications between China and other Asia-pacific countries as well as other countries and international organizations on forest rehabilitation and climate change. SFA, together with 13 carbon sink measurement teams from Beijing Forestry University, Northeast Forestry University and Kunming Survey and Design Institute, etc., completed the measurement of carbon sinks through mobile phones for over 66,700 ha of forests funded by China Green Carbon Fund. National Guidelines for Forest Carbon Sink Measurement and Monitoring Technologies was compiled. SFA also participated in making international rules and issued the Action Plan of Forest Industry on Response to Climate Change, in order to facilitate the forest carbon sink measurement and monitoring work.

Note: national data, except those on division of administrative regions, national territory and earthquake disasters in this report, do not cover Taiwan Province, Hong Kong Special Administrative Region, and Macao Special Administrative Region.

## Participating Agencies for Compilation of 2009 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