China's Fifth National Report on the Implementation of the Convention on Biological Diversity

The Ministry of Environmental Protection of China

March, 2014

Coordinating Department: Ministry of Environmental Protection

Participating Departments: National Development and Reform Commission, Ministry of Education, Ministry of Science and Technology, Ministry of Finance, Ministry of Land and Resources, Ministry of Housing, Urban and Rural Development, Ministry of Water Resources, Ministry of Agriculture, Ministry of Commerce, General Administration of Customs, State Administration for Industry and Commerce, State Administration of Quality Supervision, Inspection and Quarantine, State Administration of Press, Publication, Radio, Film and Television, State Forestry Administration, State Intellectual Property Office, State Tourism Administration, Chinese Academy of Sciences, State Oceanic Administration, State Administration of Chinese Medicine, the State Council Leading Group Office of Poverty Alleviation and Development.

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List of Acronyms or Abbreviations

AIC Administration on Industry and Commerce

ASEAN Association of Southeast Asian Nations

BSAP Biodiversity Strategy and Action Plan

CAS Chinese Academy of Sciences

CBD Convention on Biological Diversity

CBPF China Biodiversity Partnerships Framework

CCICED China Council for International Cooperation on Environment and Development

CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora

CNCG China National Coordinating Group on Implementation of the CBD

COD Chemical Oxygen Demand

COP Conference of Parties

CSPA China Strategy for Plant Conservation

EIA Environmental Impact Assessment

EU European Union

FFI Fauna and Flora International

FGD flue-gas desulfurization

GAC General Administration of Customs

GBIF Global Biodiversity Information Facility

GDP gross domestic product

GEF Global Environment Facility

GHG Greenhouse Gas

GMO genetically modified organism

GR genetic resources

GSPC Global Strategy for Plant Conservation

IAS Invasive Alien Species

IPCC Intergovernmental Panel on Climate Change

IUCN International Union for Conservation of Nature

IYB International Year of Biodiversity

MA Millennium Ecosystem Assessments

MEA Multilateral Environmental Agreements

MDGs Millennium Development Goals

MHURD Ministry of Housing, Urban and Rural Development

MLR Ministry of Land and Resources

MEP Ministry of Environmental Protection

MOA Ministry of Agriculture

MOC Ministry of Commerce

MOE Ministry of Education

MOF Ministry of Finance

MOST Ministry of Science and Technology

MPA marine protected areas

MTI Marine Trophic Index

MWR Ministry of Water Resources

NCBC National Committee on Biodiversity Conservation (of China)

NDRC National Development and Reform Commission

NPC National People's Congress (of China)

NPP Net Primary Productivity

PA protected areas

RMB renminbi (Chinese currency)

RLI Red List Index

SAIC State Administration for Industry and Commerce

SACM State Administration of Chinese Medicines

SAQSIQ State Administration of Quality Supervision, Inspection and Quarantine

SFA State Forestry Administration

SIPO State Intellectual Property Office

SOA State Oceanic Administration

STA State Tourism Administration

TK traditional knowledge

TNC The Nature Conservancy

TRIPS Agreement on Trade-related Aspects of Intellectual Property Rights

UNCCD United Nations Convention to Combat Desertification

UNDP United Nations Development Programme

UNESCO United Nations Organization of Education, Science and Culture

UNFCCC United Nations Framework Convention on Climate Change

WTO World Trade Organization/World Tourism Organization

WIPO World Intellectual Property Organization

WWF World Wildlife Fund

Executive Summary

China's Fifth National Report on the Implementation of the Convention on Biological Diversity was prepared as requested by Article 26 of the Convention and COP decision X/10. The report was prepared by the Ministry of Environmental Protection of China in collaboration with members of China's National Coordinating Group for the CBD Implementation (CNCG) and other relevant institutions. In the process of the report preparation, five national workshops were held with the participation of experts of relevant fields, having discussed about issues related to the report and reviewed initial drafts of the report. Following consultations with members of CNCG, the report was further revised and then the final report has been approved and published by the Ministry of Environmental Protection.

I. China's Biodiversity and Its Strategic Importance

Biodiversity refers to the variability among living organisms of all forms of life, including terrestrial, marine, freshwater ecosystems and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems. Biodiversity provides conditions for human survival, strategic resources for socio-economic development and important guarantees for ecological and food security. Biodiversity not only provides human beings with many livelihood necessities such as food, clean water, medicine, timber, energy and industrial materials, but also with many ecosystem services, such as carbon sequestration, oxygen release, water regulation, soil conservation, environment purification, nutrient cycling, recreation and tourism.

China is one of the twelve countries in the world with richest biodiversity. Due to its vast land area, China has various and complicated types of ecosystems. Its plant and animal resources are extremely rich. Among others, China's number of higher plant species ranks third in the world; its total number of vertebrate species accounts for 13.7% of the world's total. China's genetic resources are also rich as a place of origin of important crops such as rice and soybeans as well as an important centre of origin and distribution of wild and cultivated fruit trees. Meanwhile, China is also one of the countries facing serious threats to biodiversity. Biodiversity loss can lead to serious consequences, such as worsening health problems, higher food risks, increasing vulnerabilities and fewer development opportunities. Biodiversity conservation is therefore strategically important for China's long-term socio-economic development, well-beings of the present and future generations and building an ecological civilization in China and implementing initiatives such as Beautiful China.

II. National Biodiversity Targets

The Government of China has laid out its blueprint for building an ecological

civilization and Beautiful China. The vision for an ecological civilization is being integrated into economic, political, cultural and social developments, with a view to establish spatial layouts, industrial structures, and production and consumption patterns that promote green, cycling and low-carbon development, resource conservation and environmental protection. At the end of 2010, the State Council of China launched "National Plan for Major Function Zones", according to which the country's land is divided into four major function zones: land for priority development, land for key development, land for limited development and land prohibited for development. 25 key ecological function zones have been included in national-level land zones prohibited for development. Within these zones, large-scale and intensive industrial and urbanization development activities are limited so as to allow for environmental protection and ecological restoration and to enable ecosystems to provide ecological goods. National-level nature reserves, world cultural and natural heritage sites, national-level scenic zones, national forest parks and national geological parks have been also included in national-level land zones prohibited for development, where industrial and urbanization development activities are banned to protect natural and cultural heritages and rare animal and plant genetic resources of China.

In response to the severe situation of biodiversity loss, the Government of China launched on 17 September 2010 China's National Biodiversity Strategy and Action Plan (2011-2030) (abbreviated as "NBSAP"). Together with relevant national plans developed with a view to building an ecological civilization, NBSAP has provided a relatively comprehensive set of national targets for biodiversity conservation (see details in Table 1).

III. Main Actions

In recent years the Government of China has taken the following main actions to implement the Convention on Biological Diversity:

1. Improving legal and regulatory system and institutional mechanisms

China has basically established a legal and regulatory system for biodiversity conservation, developed and promulgated a series of national, sectoral and local standards for biodiversity conservation. In 2011, China established a National Committee for Biodiversity Conservation (NCBC) to coordinate biodiversity conservation actions at national level. The existing mechanisms such as the Inter-ministerial Joint Conference for Protection of Biological Resources and the National Coordinating Group for Implementation of the Convention on Biological Diversity, are working well. Most provincial governments have reinforced institutions related to biodiversity such as departments of the environment, agriculture, forestry and marine management, and established inter-departmental coordinating mechanisms.

Table 1. China's National Targets for Biodiversity Conservation

1. Short-term goal: by 2015, the trend of biodiversity decline in key regions will be effectively contained, specifically including:

- Biodiversity status surveys and assessments will be undertaken in 8 to 10 priority areas for biodiversity conservation, and these areas will be effectively monitored;
- *In-situ* conservation will be strengthened and terrestrial protected areas will be maintained at 15% or so of the country's land area, protecting 90% of national key protected species and typical ecosystem types;
- *Ex-situ* conservation will be undertaken on a scientific basis, providing effective protection of 80% of endangered species in areas where *in-situ* conservation is not adequate or whose wild population is very small;
- Forest coverage rate will be increased to 21.66% and forest reserves will be increased by 600 million m^3 over those in 2010;
- A system of monitoring, assessment and early warning of biodiversity, as well as those systems for access to and benefit-sharing of genetic resources and import and export of biological resources will be preliminarily established;
- Main pollutants will be reduced considerably, with COD and SO_2 emission to be reduced by 8%, NOx and ammonia nitrogen by 10% compared with those in 2010;
- Major progress will be made in building a resource-efficient and environmentally friendly society.

2. Mid-term goal: by 2020, biodiversity decline and loss will be basically controlled, specifically including:

- Biodiversity status surveys and assessments will be completed in all priority areas for biodiversity conservation, with all these areas to be effectively monitored;
- National forest holdings will exceed 2.23 million km^2, an increase of about 223,000 km^2 over that of 2010, and national forest reserves will be exceed 15 billion m^3, an increase of 1.2 billion m^3 over that of 2010;
- The cumulative areas of control of degraded, salinized and desertified grasslands will exceed 1.65 million km^2, and grassland degradation trend will be contained, with obvious improvements in grassland ecology and balance between herds and grass supply in natural grasslands achieved;
- The environmental and ecological degradation of the near-shore marine areas will be fundamentally reversed, and the decline of marine biodiversity will be basically contained;
- The aquatic ecosystems will be gradually restored and the depletion of fishery resources and the increase in the number of endangered species will be basically contained;
- A network of nature reserves with reasonable layouts and sound functions will be established, with functions of national-level nature reserves stabilized and main protection targets effectively protected;
- The biodiversity monitoring, assessment and early warning system as well as the system for management of import and export of biological resources and access to genetic resources and benefit-sharing from their use will be improved, and the documentation of associated traditional knowledge and intellectual property rights protection system will be further improved;
- The percentage of total investments from all sources into research and development will be increased to over 2.5% of GDP, with the rate of contributions from science and technology exceeding 60%;
- Energy consumption and CO_2 emissions per unit of GDP will be reduced significantly, and the total amount of main pollutants will be obviously reduced.

3. Long-term Goal: By 2030, biodiversity will be effectively protected.

2. Launching and implementing a series of plans for biodiversity conservation

In 2010, the Government of China launched and began implementing National Plan for Major Function Zones and China's updated National Biodiversity Strategy and Action Plan (2011-2030). The State Council has also approved a series of plans for promoting actions in biodiversity conservation, such as National Programme for Conservation and Use of Biological Resources (2011-2030), National Programme of Action for Conservation of Aquatic Biological Resources, National Plan for Water Area Zoning of Important Rivers and Lakes (2011-2030), National Plan for Zoning of Marine Areas (2011-2020), National Twelfth Five-year Plan for Implementation of Wetland Conservation Projects (2011-2015), National Plan for Island Conservation (2011-2020) and National Plan for Conservation and Use of Livestock Genetic Resources. China has been implementing initiatives such as eco-provinces, eco-cities and eco-counties. So far 15 provinces (autonomous regions and province-level municipalities) have begun such initiative. 13 provinces have launched their programmes for eco-provinces. More than 1,000 counties (cities and districts) have begun eco-county initiatives. As a result, 1,559 eco-towns or communities and 238 eco-villages have been established. Pilot work in building eco-cities with good aquatic ecology has been initiated with the first 46 such cities identified, thus mainstreaming biodiversity into local economic and social development.

3. Strengthening conservation systems

A system of *in-situ* conservation has been established composed primarily of nature reserves and complemented by scenic spots, forest parks, community-based conservation areas, protected sites of wild plants, wetland parks, desert parks, geological parks, special marine protected areas and germplasm conservation farms. By the end of 2013, China has established 2,697 nature reserves, covering an area of about 1.463 million km^2 which accounts for about 14.8% of China's land area. China has also established 2,855 forest parks, covering an area of 174,000 km^2 as well as 225 national-level scenic spots and 737 province-level scenic spots, covering an area of about 194,000 km^2 or 2% of China's land area. In addition, over 50,000 community-based conservation areas have been established, covering over 15,000 km^2; 179 national-level protected sites of agricultural wild plants and 468 wetland parks have been established. 45 national-level special marine protected areas (marine parks) have been established, covering a total area of 66,800 km^2, and 368 national-level conservation areas for aquatic germplasm resources have been set up, covering an area of over 152,000 km^2.

Rescuing and breeding of endangered species have been strengthened. A series of measures have been taken to rescue those endangered wild animals and plants, such as development of breeding techniques, increasing populations, strengthening caring

in the wild, habitat restoration and re-introduction to nature. As a result, a group of critically endangered wild animal and plant species have been gradually relieved from risks of extinction. Meanwhile various, effective measures have been taken to strengthen general protection of other wild animals and plants.

Ex-situ conservation measures have been also undertaken. 200 botanical gardens of various kinds have been established at different levels, collecting and storing 20,000 plants species that account for the two-thirds of China's flora. More than 240 zoos and 250 rescuing and breeding sites for wild animals have been established. A system of protection of livestock genetic resources has been established composed primarily of conservation farms and complemented by protected areas and gene banks, protecting 138 varieties of rare and endangered livestock species. Collection and storage facilities for agricultural genetic resources have been strengthened, with total number of agricultural crops collected coming to 423,000 accessions, an increase of about 30,000 accessions over that in 2007. More than 400 conservation bases for wild plant germplasm resources have been set up. Wild germplasm banks have been established in southwest China to collect and store wild germplasm resources in China.

4. Promoting sustainable use of biological resources

Rules are being implemented for managing the use of key protected wild animals and plants, such as special licensing of hunting, domestication and breeding of key protected wild animals, and licensing of collection of protected wild plants. Other rules have been implemented such as quota system for forest logging, grassland conservation, balancing between grass and herds, grazing ban, licensing of fishery, fishing ban period and areas. Restocking of aquatic species has been increased and mari-culturing multiplied. Management and law enforcement of breeding and use of wild animals and plants have been reinforced. Strict technical standards have been developed and specialized labeling systems put in place for breeding and use of wild animals and plants. Artificial breeding or cultivation has been undertaken for those endangered species whose population recovery proves relatively difficult. Alternatives have been developed to relieve pressures on their use. Law enforcement has been reinforced to crack down the illegal collection and sales of national key protected wild animals and plants and their products. A number of major cases of smuggling of endangered species have been investigated and punished.

5. Conserving and restoring habitats

A number of key ecological projects continue to be implemented, such as natural forests protection, returning cultivated lands to forests, returning grazing land to grassland, forest belt construction in north, northeast and northwest China as well as in the Yangtse River and coastal areas, control of sandstorms affecting Tianjin and Beijing, comprehensive control of desertification in rocky areas, wetland protection

and restoration and integrated control of soil erosion. Since 2001, obvious ecological improvements have been observed in areas where these key projects have been implemented. Forest resources in China have been increasing constantly, with forest areas increased by 23%, forest coverage rate by 3.8% and forest reserves by 21.8% compared with those of a decade ago. A number of wetlands of national and international importance have been rescued and protected, with the protection rate of natural wetlands increasing by over 1% on the average annually. As a result, about a half of natural wetlands has been effectively protected. The area where mangroves and degraded wetlands in the near-shore coastal areas such as tidal flats have been restored has exceeded 2,800 km^2, as a result of an investment of 4.43 billion yuan RMB. The area covered by soil erosion control reached 270,000 km^2 as a result of integrated control measures taken in 12,000 small river basins. The area enclosed for reforestation and conservation has reached 720,000 km^2, with initial ecological recovery occurring in areas of 450,000 km^2. Since 2008, the central government has allocated specialized funds of 19.5 billion yuan RMB for rural environment improvement. These funds supported environmental improvements in 46,000 villages and more than 87 million people in rural areas benefited from these efforts. The implementation of key ecological projects has enhanced recovery of degraded ecosystems and habitats for wild species, thus effectively conserving biodiversity.

6. Developing and implementing incentives favorable for biodiversity conservation

To avoid negative impacts on biodiversity and the environment, the Government of China eliminated in 2007 export subsidies of 553 highly energy-consuming, highly polluting and resource-consuming products, including products from endangered species, leather products, wood products and some disposal wood-made products.

The Government of China has subsidized those rural households involved in key ecological projects. Subsidies were given to those farmers who have returned their cultivated land to forests according to verified areas. By the end of 2012, the central government has cumulatively invested 324.7 billion yuan RMB into this project and 120 million farmers have directly benefited from such investments, with each household being given a subsidy of 7,000 yuan RMB on the average.

For the natural forest protection project, the Government of China has provided subsidies for forest management, conservation and nurturing and reforestation. The government has also covered pension and other insurances for employees of all forestry enterprises, and subsidized living costs of those laid-off employees and social expenditures of forestry enterprises. During the first phase of the natural forest protection project the government has invested 118.6 billion yuan RMB. At the end of 2010, the State Council decided to implement a second phase of this project, which will invest about 244 billion yuan RMB in total from 2011 to 2020.

The Forest Ecological Benefits Compensation Fund was established to subsidize plantation, nurturing, conservation and management of forests for ecological benefits. In 2013, the central government transferred a total of 14.9 billion yuan RMB to various local governments as subsidies for public benefit forests.

Subsidies were also provided to those herdsmen who have returned their grazing land to grassland to cover part of costs for grassland enclosures and forages. During 2003-2012 the central government invested 17.57 billion yuan RMB, benefiting more than 4.5 million herdsmen. In 2011 a mechanism to subsidize and reward grassland ecology conservation was established, and so far subsidies worth 28.6 billion yuan RMB have been provided cumulatively, respectively to areas (820,000 km^2) where grazing bans are implemented and areas (1.737 million km^2) where balancing grass supply with herds is required.

The government has set up a specialized fund to support national key ecological function zones. The funds transferred in 2013 came up to 42.3 billion yuan RMB.

7. Enhancing establishment of biosafety management system

The system of prevention and control of invasive alien species (IAS) has been improved and a monitoring and early warning system established for forest pests and agricultural IASs. Elimination of IAS has been undertaken. Safety assessments, production licensing, commercialization licensing, product labeling and genetically modified product import/export approval have been put in place for agricultural genetically modified organisms (GMOs), and approval of genetic engineering of trees has been undertaken, covering all phases of GMOs from research, development to application.

8. Controlling environmental pollution

Considerably reducing the total amount of major pollutants is one of the binding targets that the Government of China has set for social and economic development and for solving those serious environmental problems. In the past decade, overall the annual average concentration of major pollutants has been going down. The intensity of emission of pollutants per unit of GDP has decreased by over 55%. Since 2004, the density of CO_2 emission per unit of GDP has decreased by 15.2%. The Government of China has been strictly implementing rules of environmental impact assessments (EIAs). Since 2008 the national government has refused to approve 332 projects with total investment of 1.1 trillion yuan RMB, which are projects of high pollution, high energy consumption, high resource consumption, low-level duplicate construction and excessive production capacities.

9. Promoting public participation

China has incorporated relevant biodiversity knowledge into primary and secondary school curriculum, and provided biodiversity-related degree programs in many universities or colleges. By 2012, more than 556,000 professionals on biodiversity have been trained through such programs. Relevant government departments and governments of levels have strengthened communication and education in biodiversity. In particular various activities were organized to celebrate the International Year of Biodiversity in 2010, and through various media, reaching out to more than 900 million people. In each of the subsequent years training activities were organized for journalists and large-scale communication and educational activities organized to promote business engagement with biodiversity conservation. As a result, public awareness of biodiversity conservation has obviously increased, and public participation in biodiversity conservation effectively mobilized.

The conservation actions mentioned above have generated obvious impacts, primarily including:

(a) Constant increase in forest resources, with an increase of 23% in forest areas and of 21.8% in forest growing stock over those of a decade ago.

(b) Comprehensive soil erosion control has been undertaken in 12,000 small river basins, covering an area of 270,000 km^2; and areas of 720,000 km^2 have been enclosed for reforestation and conservation, and among others ecological recovery has started in areas of 450,000 km^2. Since 2006, an additional area of 18,000 km^2 of wetlands has been protected and 1,000 km^2 of wetlands have been restored.

(c) The populations of national key protected animals and plants have been steady and increasing in some cases. The scale of their distribution has been increasing as well and their habitats constantly improving. The number of Giant Pandas（*Ailuropoda melanoleuca*） rose from over 1,000 in the 1980's to 1,590 currently. The number of Crested Ibises（*Nipponia nippon*） has grown from 7 in the 1980's to more than 1,800 at present. The populations of protected plants such as yews, orchids and cycads have been expanding.

(d) By the end of 2013, 2,697 nature reserves have been established, covering a total area of 1.463 million km^2 and accounting for about 14.8% of the country's land area. In addition, a considerable number of scenic spots, forest parks, community-based conservation areas, protected sites for agricultural wild plants, wetland parks, geological parks, special marine protected areas and germplasm conservation farms have been established. The nature reserves have effectively conserved 90% of terrestrial ecosystem types, 85% of wild animal populations and 65% of higher plant biota, covered 25% of primary forests, more than 50% of natural wetlands, 30% of typical desert areas and nearly 3% of the marine areas under China's jurisdiction.

(e) The total amount of major pollutants has been going down. Since 2000, the intensity of emission of pollutants per unit of GDP has decreased by more than 55%. Since 2004, the intensity of CO_2 emission per unit of GDP has decreased by 15.2%.

In sum, the Government of China has enhanced its efforts in biodiversity conservation and taken various measures, such as improving conservation policies, strengthening establishment of conservation systems, restoring degraded ecosystems, controlling environmental pollution, strengthening science and technology research, promoting public participation and increasing investments. As a result of all these actions, the trend of ecological worsening has been relatively controlled; functions in some ecosystems have recovered and the populations of some key protected species have been increasing. The implementation of updated NBSAP has a good beginning and positive progress is being made. One action has achieved significant progress, 15 actions achieved considerable progress and 14 actions achieved some progress (see details in Table 2 below).

Table 2 Assessment of Implementation of NBSAP

Actions	Assessment	Actions	Assessment
1 Develop policies that promote biodiversity conservation and sustainable use		**16** Strengthen establishment of conservation farms for livestock genetic resources	
2 Improve legal system for biodiversity conservation and sustainable use		**17** Develop an *ex-situ* conservation system on a scientific basis	
3 Establish and improve biodiversity conservation and management bodies and improve cross-sectoral coordination mechanisms		**18** Develop and improve system of storing genetic resources	
4 Mainstream biodiversity into regional and sectoral planning processes and plans		**19** Strengthen reintroduction of artificially bred species and recovery of wild species	
5 Ensure sustainable use of biodiversity		**20** Strengthen research, development and innovation in use of genetic resources	
6 Reduce impacts of environmental pollution on biodiversity		**21** Establish a system and mechanism for access to and benefit-sharing of genetic resources and associated TK	
7 Undertake baseline surveys of status of biological resources and ecosystems		**22** Establish a system of inspection and examination of import and export of genetic resources	
8 Survey and inventory genetic resources and associated traditional knowledge		**23** Upgrade capacities of early warning and monitoring of and emergency response to alien species invasion	
9 Undertake monitoring and early warning of biodiversity		**24** Establish and improve system of biosafety assessment, monitoring and detection of GMOs	
10 Enhance and coordinate information systems for genetic resources		**25** Develop an action plan for addressing climate change impacts on biodiversity	
11 Undertake comprehensive biodiversity assessments		**26** Assess impacts of biofuels on biodiversity	
12 Improve and coordinate implementation of protected areas planning across the country		**27** Strengthen scientific research in the field of biodiversity	
13 Strengthen protection in priority areas for biodiversity conservation		**28** Strengthen personnel training in the field of biodiversity conservation	
14 Strengthen standardized management of PAs and their management effectiveness		**29** Establish mechanisms for broad public participation	
15 Strengthen biodiversity conservation in areas outside PAs		**30** Promote establishment of partnerships for biodiversity conservation	

Note:  fully achieved;  significant progress;  considerable progress;  some progress;  no progress

In achieving the global 2020 biodiversity targets (20 in total), assessments have shown various degrees of improvements in indicators for targets 1, 3, 4, 5, 7, 8, 10, 11, 14, 15, 17, 19 and 20, except that there are no indicators available to assess progress towards targets 2, 16 and 18. This indicates that achievement of these targets is on track. In particular considerable progress has been made in achieving target 3 (incentive measures), target 5 (habitat loss and degradation reduced), target 8 (environmental pollution controlled), target 11 (protected areas strengthened and managed effectively), target 14 (important ecosystem services restored and ensured) and target 15 (resilience and carbon sequestration of ecosystems reinforced). However, most indicators for target 5 (grassland ecosystem protection among them), target 6 (sustainable fishery), target 9 (control of invasive alien species), target 12 (endangered species protected) and target 13 (protection of genetic resources) have shown worsening trends. This indicates that many more effective policies and measures still need to be taken to achieve these targets, though much has been done so far (see Table 3).

IV. Threats to Biodiversity and Main Issues and Priorities for Biodiversity Conservation

Despite various measures taken by the Government of China for biodiversity conservation, the biodiversity decline trend has not been fundamentally contained. The percentage of endangered invertebrates (critically endangered, endangered and vulnerable) is 34.7%. The percentage of endangered vertebrates is 35.9%. The number of endangered plants is 3,767, accounting for 10.9% of the total higher plant species assessed in China. The number of higher plant species that require attention and protection has come up to 10,102, accounting for 29.3% of the total species assessed in China. The loss of genetic resources is also very serious. According to the result from the second national survey on livestock genetic resources, the populations of more than a half of local breeds or varieties have been going down.

1. Threats

Direct pressures that cause biodiversity decline are:

(a) Degradation or loss of habitats. Habitats for wild animals and plants have been destroyed by activities such as reclamation of wetlands and grasslands, coastal development and construction of major transportation and hydropower projects, posing direct threats to reproduction of species and populations.

(b) Excessive exploitation of natural resources. Overgrazing of grasslands led to degradation and desertification of grasslands. High-intensity fishing accelerated depletion of fishery resources. Despite a series of law enforcements, illegal trades in wild animals and plants still occur, and are even very rampant in some regions of China.

Table 3. Assessment of China's Progress in Achieving 2020 Aichi Targets

Targets	Indicators	Trends	Targets	Indicators	Trends
1. Awareness of biodiversity increased	Items related to China's biodiversity searched through Google or Baidu	✓		Reductions in pollutants	✓
3. Incentive measures	Ecological compensation and investments into key ecological projects	✓	**10.** Pressures on coral reefs and other vulnerable ecosystems reduced	Forest growing stock	✓
4. Sustainable production and consumption	Reductions in pollutants	✓		Reductions in areas affected by soil erosion	✓
	Indicators for sustainable consumption	•••		Biodiversity of coral reefs	•••
5. Habitat degradation and loss reduced	Forest areas and growing stock	✓		Climate change impacts on biodiversity	•••
	Wetland ecosystem areas	✓	**11.** Strengthen system of protected areas and management effectiveness	Number and area of protected areas	✓
	Grassland ecosystem areas	✗		Ecological representativeness and management effectiveness of protected areas	•••
	Fresh grass output from natural grasslands	✓	12. Endangered species protected	Red List Index	✗
	Areas of desert ecosystems reduced	✓	**13.** Genetic resources protected	Number of local varieties	✗
	Ecological degradation	•••	**14.** Important ecosystem services restored and ensured	Net income per capita of rural households and reduction in number of people living in poverty	✓
6. Sustainable fishery	Marine trophic index	✓		Forest growing stock	✓
	Red List Index of fishes	✗		Reductions in areas affected by soil erosion	✓
	Fishery impacts on biodiversity	•••		Reductions in desertified areas	✓
7. Sustainable agriculture, aqua-culturing and forestry	Forest growing stock	✓	**15.** Ecosystem resilience and carbon sequestration increased	Forest growing stock	✓
	Grass output from natural grasslands	✓		Reductions in areas affected by soil erosion	✓
	Agricultural impacts on biodiversity	•••		Reductions in desertified areas	✓
8.Environmental pollution controlled	Reductions in pollutants	✓	**17.** NBSAP Implementation	Implementation of policies and programmes	✓
9. Invasive alien species controlled	Number of new IAS found every two decades*	✓	**19.** Scientific & technological achievements developed and applied	Academic papers on biodiversity	✓
				Items related to China's biodiversity searched through Google or Baidu	✓
			20. Significant increase in investments	Investments into key ecological projects	✓

Note: ✓ Increasing; ✗ Decreasing; ••• No adequate data; * IAS negative impacts on biodiversity increasing

(c) Environmental pollution. Water pollution in rivers, lakes and seas directly threats aquatic biodiversity. Use of agricultural chemicals, fertilizers and pesticides has caused increasingly serious environmental pollution. The pollution of coastal and near-shore marine areas is still serious, though overall the marine environmental quality of the areas under China's jurisdiction is not bad. Marine environmental pollution seriously affects marine biodiversity, having caused various marine ecological disasters, such as red tide.

(d) Large-scale cultivation of single species. Only a few agricultural crops are cultivated, with many traditional varieties eliminated or some of them having even disappeared forever.

(e) Invasion of alien species. China is one of the countries in the world most severely affected by invasion of alien species. There are more than 500 invasive alien species in China, which have caused huge losses to the environment and economy.

(f) Climate change. Climate change has changed the phenology, distribution and migration of species, caused disappearance of some species in their original habitats as well as changed distribution of pests, thus aggravating threats they cause.

2. Main issues

Main issues China faces in biodiversity conservation are: (a) inadequate legal and institutional systems; (b) low-level awareness of conservation; (c) conflicts between conservation and development and use; (d) inadequate financing or investment; (d) inadequate scientific research.

3. Priorities

China has a lot more to do for biodiversity conservation. Next few years are a key period for biodiversity conservation in China. China needs greater determination, more effective measures and more resources to reverse fundamentally the biodiversity loss trend. Future priorities should be given to the following key tasks:

(a) To improve legal and regulatory system for biodiversity and reinforce law enforcement. Existing laws such as Environmental Protection Law, Wild Animal Protection Law, Wild Plant Protection Regulation and Regulation on Nature Reserves need to be revised or updated. New laws or regulations such as Wetland Protection Regulation, Invasive Alien Species Control Regulation, Regulation on Management of Genetic Resources and Regulation on Biosafety Management of Genetically Modified Trees need to be developed. The ownership of natural resources and their use control system needs to be further defined, with very strict rules to be put in place for source protection, compensation for losses and life-time accountability for causing ecological damage. The payment for ecosystem services should be established as quickly as possible, in particular in those priority areas for biodiversity conservation. Law enforcement needs to be reinforced to further crack down those illegal activities causing damage to biodiversity and strengthen inspection and examination of import

and export of biological resources.

(b) To enhance public participation and increase public awareness of conservation. Various forms of communication and education activities will be undertaken. The roles of various civil society organizations and the private sector will be fully played to increase public awareness. Policies and mechanisms for social supervision of biodiversity conservation will be explored and established. Citizen science will be developed and public participation in biodiversity conservation will be enhanced so that an environment will be created for all the public to make joint efforts in conservation and sustainable use of biodiversity.

(c) To implement National Major Function Zone Plan and China's updated NBSAP. A system of land spatial development protection should be put in place to improve layouts for spatial development. Biodiversity conservation measures should be proposed for various major function zones. Red lines for ecological conservation should be drawn to ensure ecological security of the country's land. Practical efforts should be made to implement the updated NBSAP. Management and supervision of biodiversity priority areas should be strengthened. Biodiversity should be mainstreamed into national, sectoral and local planning. The environment management of various development and construction activities should be strengthened and responsibilities for developers to restore ecology or ecosystems should be implemented. A system of review, assessment and supervision should be established to promote effective implementation of various plans and programmes.

(d) To further improve networks of *in-situ* conservation and reinforce *in-situ* conservation. Spatial structures of nature reserves and scenic spots should be better-designed for a more effective network of biodiversity conservation. A system of national parks should be established. Major ecological projects should continue, such as natural forest protection, returning cultivation land to forests and grazing land to grasslands, construction of forest belts in north, northeast and northwest China as well as in the Yangtse River Basin, control of origins of sandstorms affecting Beijing and Tianjin, comprehensive control of rockiness in Karst areas, wetland protection and restoration, management of protected areas, and comprehensive control of soil erosion. Major projects for biodiversity conservation should be initiated.

(e) To strengthen institutions and their capacities and improve their management levels. The coordination of the National Committee for Biodiversity Conservation will be strengthened. The National Coordinating Group for Implementation of the Convention on Biological Diversity and the Inter-Ministerial Joint Conference on Conservation of Biological Resources should continue to play their roles. Capacities of relevant departments and bodies involved in biodiversity conservation should be further strengthened, with particular support to be provided to local governments and communities for their efforts in biodiversity conservation so as to improve their management level.

(f) To establish a system of biodiversity survey, monitoring and assessment as well as regularly launch survey and assessment results. Biodiversity surveys should be undertaken on a regular basis. A monitoring and early warning system for biodiversity should be established to capture in time dynamic changes in biodiversity, to launch Biodiversity Red Lists, and to more effectively monitor important species and ecosystems.

Part I. Current Status of and Threats to China's Biodiversity

1.1 Importance of Biodiversity for Social and Economic Development

Biodiversity refers to the variability among living organisms of all forms of life, including terrestrial, marine, freshwater ecosystems and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems (the Convention on Biological Diversity). To put it simply, biodiversity refers to all species of plants, animals, micro-organisms and other forms of life on the Earth and their genetic varieties, as well as ecosystems they form in the environment.

Biodiversity provides conditions for human survival and material foundations for sustainable social and economic development as well as guarantees for ecological and food security. Biodiversity is also one of the important sources of literature, arts and scientific and technological innovations. Biodiversity has many values and functions. The primary industries such as agriculture, forestry, husbandry and fishery use biological resources directly, providing essential materials for human livelihood. Most of the second industries in particular pharmaceutical manufacturing, uses biological resources and their products directly as raw materials. More than 50% of medicinal components in the world come from animals and plants. Various and complicated ecosystems not only provide the environment for human survival, but also many ecosystem services. According to relevant estimates in 2000, the values of ecosystem services provided by forests in China, such as goods provided, carbon sequestration and oxygen release, water regulation, soil conservation, environment purification, nutrient cycling, recreation and biodiversity conservation, were about 1.4 trillion yuan RMB/a, equivalent to 14.2% of China's GDP of that year (Zhao et al, 2004). Grassland is a sink of carbons for the planet. The total carbon storage capacity of grassland ecosystems in China is about 44.09 billion tons. Grassland is also a natural water reservoir and energy store. 80% of the water flowing into the Yellow River, 30% of the water flowing into the Yangtse River, and more than 50% of the water flowing into rivers in northeast China come directly from grasslands. The total values of grassland ecosystems in China reach 1.2403 trillion yuan RMB (equivalent to 149.79 billion USD), about 3,100 yuan RMB for per hectare of grassland which far exceeds the value production on grasslands creates (Xie, 2001). Wetlands in China store about 270 million tons of fresh water which accounts for 96% of the total usable fresh water resources in China, so wetlands play an important role in water regulation, hydrological adjustment, water quality purification, underground water supply, flood control and combating droughts. Wetlands provide habitats for 20% of known species in the world and maintain rich biodiversity, therefore they are precious banks of germplasm and genetic resources. Wetlands are also a big sink of carbons whose carbon storage capacity is 35% of the totality of the terrestrial ecosystems. Pollination by insects plays a huge role for fruit and vegetable production in China. The economic value of pollination for fruit and vegetable growth estimated in 2008 was

52.17 billion USD, accounting for 25.5% of the gross output value of 44 varieties of fruits and vegetables (An & Chen, 2011). In some biodiversity-rich regions, such as Hainan Island, the regulation function of its ecosystems is valued eight times more than the value of goods produced (Ouyang et al, 2004). The value of ecosystem services provided in Xishuangbanna is 11 times more than the total value of GDP of the region (Jing & Ma, 2012).

Biodiversity attracts increasing attention of the international community due to its important roles in a nation's or a region's social and economic development. It has become another hot topic in the international environmental community, second to the issue of climate change.

1.2 Current Status of China's Biodiversity

China is one of the twelve countries with richest biodiversity in the world, and the country with richest biodiversity in the Northern Hemisphere. China has many types of natural ecosystems, such as forests, shrubs, meadows, grasslands, deserts, tundra, wetlands, marine and coastal ecosystems (The Ministry of Environmental Protection, 2011). According to the statistics from the Project of Remote-sensing Survey and Assessment of National Ecological Changes in the Decade from 2000 to 2010, the ecosystems with areas ranking top four are grassland, forest and agricultural ecosystems and deserts, with the total areas of these four ecosystems accounting for 82.7% of the areas of all ecosystems in China (Table 1.1, Figure 1.1).

China has more than 30,000 higher plant species, ranking third in the world, following Brazil and Colombia. China has over 6,000 vertebrate species, accounting for 13.7% of the world's total (The Ministry of Environmental Protection, 2011). The richness of vascular plants and mammals in China is characterized by highness in south China and lowness in north China, highness in mountains and lowness in plains.

Table 1.1 Distribution of Terrestrial Ecosystems of China and Percentage of Areas of All Ecosystems in 2010

Ecosystem Types	Area（10^3km^2）	Percentage of Areas of All Ecosystems（%）
Grassland ecosystem	284.2	30.0
Forest ecosystem	191.3	20.2
Shrub ecosystem	69.6	7.4
Aquatic and wetland ecosystem	33.8	3.6
Agricultural ecosystem	180.9	19.1
Urban ecosystem	25.4	2.7
Desert ecosystem	126.5	13.4
Others	34.1	3.6

Note: Data above do not include those from Taiwan Province of China

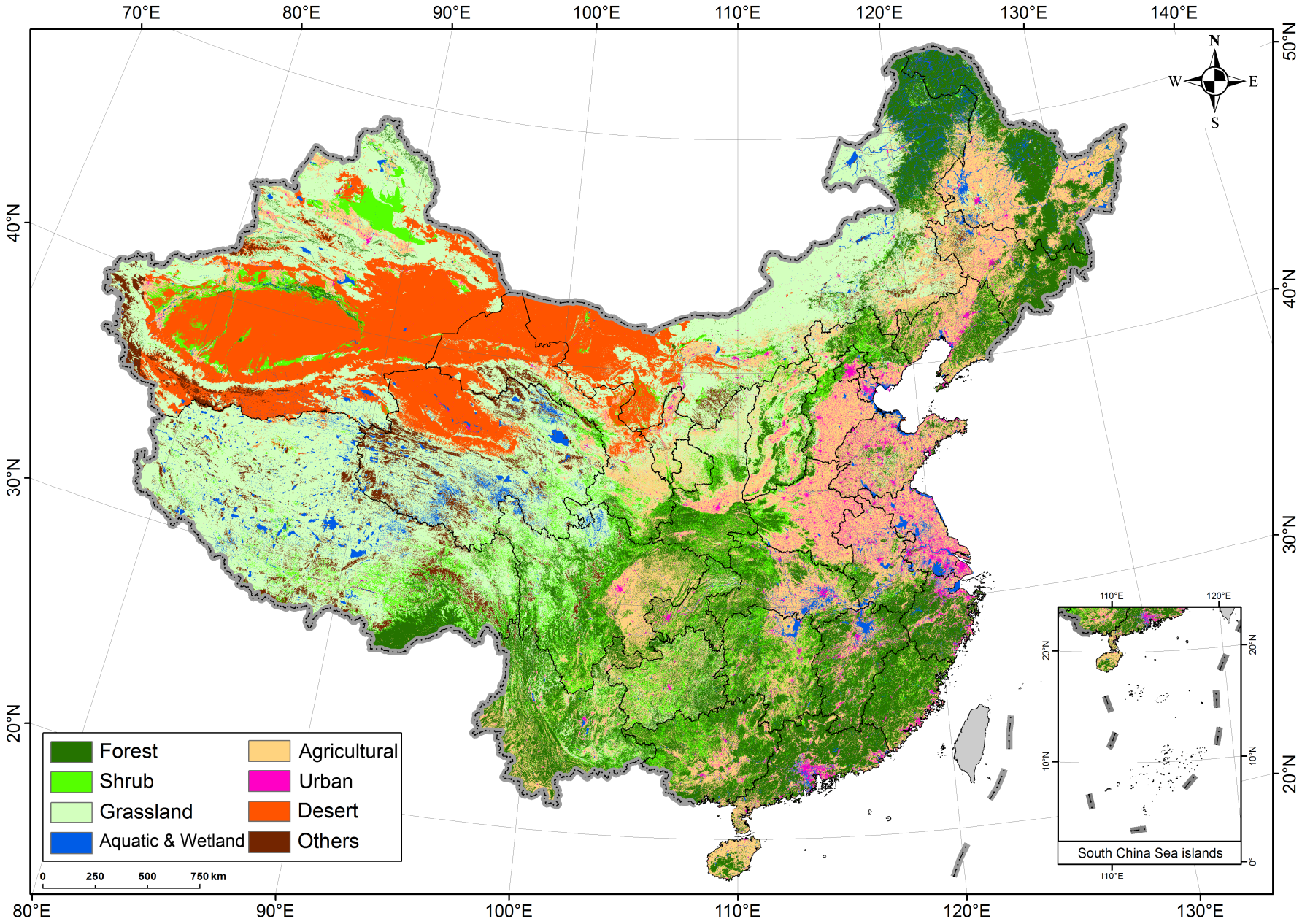


Figure 1.1 Map of Distribution of China's Terrestrial Ecosystems in 2010. Data of Taiwan Province of China was not included.
Source: Project of Remote-sensing Survey and Assessment of Ecological Changes in China from 2000 to 2010, courtesy of Ouyang et al

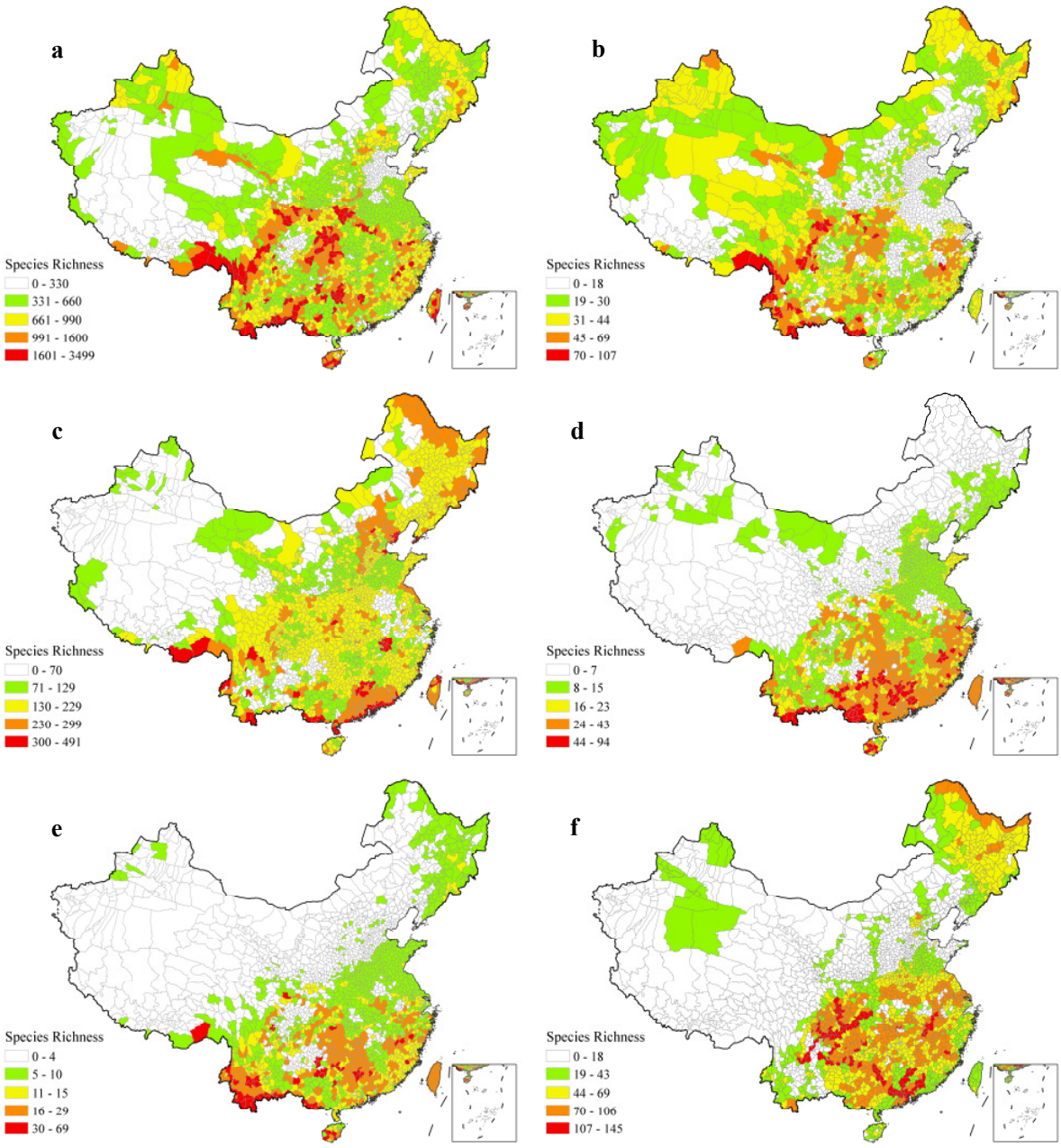


Figure 1.2 Spatial Distribution of China's Wild Vascular Plant and Vertebrate Species. (a) Vascular plants; (b) mammals; (c) birds; (d) reptiles; (e) amphibians; (f) inland water fishes

The main areas rich in vascular plants and mammals are Min Mountain, Qionglai Mountain, Hengduan Mountain, southeastern section of Himalaya Mountain, Qinling Mountain, Daba Mountain, Wuling Mountain, Wuyi Mountain, Xishuangbanna, border areas of southwestern Guangxi, and central and southern parts of Hainan (Figures 1.2 a, b). Most of the birds in China are migratory, flying to reproduction sites in the spring, and to the wintering sites in the south in the autumn. The distribution of birds is obviously characterized by their migration. The main areas rich in birds are the Bohai Sea rim region, Taiwan Island, coastal areas of Guangdong and

Guangxi, Poyang Lake Basin, southeastern part of Tibet, Hengduan Mountain, Gaoligong Mountain in northwestern Yunnan and Xishuangbanna (Figure 1.2 c). Amphibians and reptiles in China are mostly distributed in the region south to Qinling Mountain and Huai River. Regions rich in amphibians and reptiles are mainly Wuyi Mountain, Xishuangbanna, southwest Guangxi, Nanling Mountain and southern and central parts of Hainan (Figure 1.2 d, e). Areas with richest inland water fishes are the Yangtse River Basin and the Pearl River Basin, followed by the Huai River Basin and Heilongjiang River Basin. Hot areas of inland water fishes are mainly located in main branches in the upper reaches of the Yangtse River and its main branch Jialing River, as well as Wu River, the Pearl River, Min River, Poyang Lake and Dongting Lake (Figure 1.2 f) (Xu et al, 2013).

China has rich marine biodiversity. The number of marine species recorded so far has exceeded 28,000, accounting for about 11% of the world's total marine species. Among them, in the prokaryotes there are 9 phylum and 574 genus. In the protista there are 15 phylum and 4,894 genus. In the fungi there are 5 phylum and 371 genus. In the flora, there are 6 phylum and 1,496 genus, and in the fauna there are 24 phylum and 21,398 genus.

China has rich genetic resources, as a place of origin of important crops such as rice and soy beans as well as one of main centers of origin of wild and cultivated fruit trees. According to incomplete statistics, China has 1,339 varieties of cultivated crops, and 1,930 varieties of wild relatives. China's varieties of fruit trees rank top in the world. China is one of the countries with richest varieties of domesticated animals in the world, with 576 breeds of domesticated animals (The Ministry of Environmental Protection, 2011).

The percentage of endangered invertebrates in China (critically endangered, endangered and vulnerable) is 34.7% and the percentage of endangered vertebrates is 35.9% (Wang & Xie, 2004). The number of endangered plants in China is 3,767, accounting for about 10.9% of the total higher plant species in China. The number of higher plant species that require attention and protection is 10,102, accounting for 29.3% of the total (The Ministry of Environmental Protection & Chinese Academy of Sciences, 2013). China's loss of genetic resources is serious. According to the result of the second national survey on livestock genetic resources, 15 local breeds cannot be found any more, and the populations of more than a half of local breeds have been going down (National Committee on Livestock Genetic Resources, 2011).

1.3 Main Threats to Biodiversity in China

Biodiversity in China is facing various threats. The main pressures come from the rapid population growth and the accelerating pace of industrialization and urbanization, which have caused degradation or loss of habitats for wild species.

Other threats include overexploitation of natural resources, environmental pollution, large-scale plantation of single species, invasive alien species and climate change.

(1) Degradation or loss of habitats for wild species

The main factor that endangers wild species is the degradation or loss of habitats (Wei, 2010; the Ministry of Environmental Protection and the Chinese Academy of Sciences, 2013). The land reclamation from wetlands undertaken from the 1950's to the 1990's has drastically shrunk the areas of wetlands. Despite some increases in the area of inland water in recent years, the area of land reclamation from tidal flats is still increasing. The area of land reclamation from the seas from 2008 to 2012 reached 650.6 km^2. As a result of land reclamation from tidal flats, the mangrove of China has decreased by about two-thirds, causing direct damage to habitats and reproduction sites for some important protected species. The total area of land reclamation from grasslands since the 1950's has come up to 193,000 km^2, with 18.2% of the total existing arable land of China coming from grassland reclamation (Fan et al., 2002). Incidents of grassland reclamation are still occurring in recent years. Railway and road construction has fragmented habitats for wild plants and animals, posing direct threat to reproduction of these populations. China's hydropower generation capacity has exceeded 230 million kilowatts, ranking top in the world, however dam building and flood control facilities have fragmented or obstructed rivers and lakes and drastically changed the natural conditions of water courses, causing disastrous impacts on reproduction of fishes (Xu, 2006).

(2) Overexploitation of natural resources

The overexploitation and use of wild biological resources has led to drastic decreases in species and populations as well as depletion or degradation of biological resources. Overgrazing of grasslands is serious. The rate of overgrazing exceeding capacities of key grasslands in China is 28% (Grassland Monitoring and Management Center, Ministry of Agriculture, 2012). Overgrazing for long time has degraded and desertified grasslands. By now 90% of grasslands in China have been degraded or desertified to varying degrees. Marine fishery plays an important role in China's fishery industry, with the marine catch amounting up to 15 million tons (Fishery Bureau, Ministry of Agriculture, 2011). High-intensity fishing has accelerated depletion of marine fishery resources, resulting in increases in catches of small, young, low-value fishes and lowering nutrition level of fishes. Wild animals and plants have many economic values such as that for pharmaceuticals, food and recreation, and easily become targets of illegal trade. Despite law enforcement actions taken by China, illegal trade is still serious, and even very rampant in some regions.

(3) Environmental pollution

Environmental pollutants can generate various toxicities that can prevent normal

growth of biological organisms and their reproductive and survival capabilities. The use of fertilizers, pesticides and herbicides has also caused increasing environmental pollution. Eutrophication caused by water pollution in Dianchi Lake of Kunming since the 1950's has reduced the species richness of higher aquatic plants by 36% and fishes by 25% (Lu et al, 2009). The pollution of China's coastal and near-shore marine areas is serious, though the overall environmental quality of the marine areas under China's jurisdiction is good. The marine environmental pollution has seriously damaged marine biodiversity, causing many marine ecological disasters such as red tide.

(4) Large-scale plantation of single species

With development and wide application of new varieties, cultivation of crops uses only a few species, leading to dramatic increases in areas of cultivation of single species. This has led to elimination or even permanent disappearance of many traditional varieties that contain important genetic resources.

(5) Invasive alien species

Invasion of alien species is one of the main causes of biodiversity loss. Due to its vast land area that covers nearly 50 latitudes and 5 climatic zones, as well as diversity of its ecosystems, China is more vulnerable to invasion of alien species, and species from any parts of the world may find suitable habitats in China. China is one of the countries that are most seriously affected by invasive alien species. The number of invasive alien species known so far in China has exceeded 500 (Xu & Qiang, 2011). Invasion of alien species such as *Bursaphelenchus xylophilus*, *Oracella acuta*, *Hemiberlesia pitysophila*, *Hyphantria cunea*, *Matsucoccus matsumurae*, *Lissorhoptrus oryzophilus*, *Liriomyza sativae* and *Achatina fulica*, has caused serious negative impacts on agricultural production, the environment and biodiversity. It is estimated that the total annual cost of invasive alien species to the environment and economy of China is around 119.9 billion yuan (Xu et al, 2004).

(6) Climate change

Climate change shifts the phenology, distribution and migration of species, and causes some species to disappear from their original habitats. The climate in Qinghai Lake area is warming, so 26 bird species such as bean goose have disappeared from the lake area, compared with the situation in the 1950's (Ma & Jiang, 2006). Climate change also expands the scope of distribution of pests and aggravates their harm. For example, climate warming expands the scope of distribution of *Solidago canadensis* (Wu & Liu, 2008). Climate change modifies the population structure of marine species. The population and its density of cold-water animals in the Yellow Sea of China have decreased as the water temperature rises. The cold water benthic biota diversity in the Yellow Sea has decreased considerably compared with the situation of

a half century ago (Liu, 2011).

1.4 Economic and Social Implications of Biodiversity Loss

Biodiversity not only provides human beings with necessary living materials, industrial materials and natural medicinal herbs, but also plays key roles in protecting the environment and maintaining ecological security, in particular in purifying the environment, ensuring water quality and improving soil quality. Biodiversity provides material foundations for human survival and sustainable social and economic development, and therefore very important for human well-being of the present and future generations. According to the Millennium Ecosystem Assessment, biodiversity loss will directly or indirectly cause more health problems, higher food risks, increasing vulnerabilities and fewer development opportunities (MEA, 2005).

(1) Direct impacts on human life and property

Biodiversity loss will increase vulnerabilities of ecosystems. Loss of components of biodiversity, in particular decrease in functional diversity and ecosystem diversity at landscape level, will lead to decrease in ecosystem stability. Mangroves and coral reefs are rich sources of biodiversity as well as very good buffers of floods and storms. If mangroves and coral reefs are damaged, floods in coastal areas will increase, seriously affecting mari-culturing and houses of the residents in coastal areas. Excessive deforestation will cause soil erosion which is one of the important causes of landslides.

(2) Impacts on food security

Biodiversity loss will reduce food diversity, forcing human being to depend on only a few main kinds of food, thus breaking the balance of human food structure and affecting human health. For example, loss of pollinating insects will reduce outputs of crops depending on insect pollination (Garibaldi et al., 2011). Wild relatives of crops play an important role in agricultural production. In the 1970's, Academician Yuan Longping, a well-known Chinese expert on rice seed breeding, used wild rice sterile plants found in Hainan to hybrid with cultivated rice and successfully created hybrid rice, making remarkable contribution to food security in China and the world. However if wild rice had disappeared then he would not have made such a huge scientific achievement. Unfortunately, the natural population of wild rice in China is currently rapidly declining, and on the verge of extinction in some sites of distribution. The extinction of wild rice is not just a loss of one species, but will have significant implications for human food security.

(3) Impacts on pharmaceutical sector

China has more than 12,000 kinds of medicinal resources, ranking high in the world. Rare medicinal resources are usually characterized by small areas of distribution, poor capacity of re-generation and long period of growth. Excessive use of wild medicinal resources for long has drastically reduced reserves of many medicinal resources, and even caused extinction of some of them. The development of the pharmaceutical sector will depend on rich medicinal resources, and the sector will lose foundations for development if without these medicinal resources. Despite more and more medicines from lab research and development, a large number of people in the world are still using natural medicines to treat their diseases. The loss of natural medicinal resources will have serious implications.

(4) Impacts on future development

Biodiversity loss will reduce development opportunities of local communities and residents. Biodiversity loss and ecosystem destruction may lead to a decreasing number of tourists in those regions that used to have rich resources for tourism, and local communities and residents will lose opportunities to develop tourism. In some cases biodiversity loss is irreversible, therefore future generations will lose development opportunities.

To protect biodiversity is a must for ensuring ecological security, and important for maintaining productivity of the natural environment and achieving sustainable development. It is also crucial for changing China's economic development patterns, building an ecological civilization, achieving sustainable development as well as realizing China Dream.

Part II. National Biodiversity Strategy and Action Plan and its Implementation

2.1 Development of China's Updated NBSAP

China's updated National Biodiversity Strategy and Action Plan (2011-2030) was approved at the 126th regular meeting of the State Council on 15 September 2010, and promulgated by the Ministry of Environmental Protection on 17 September 2010. This updated NBSAP has identified guiding principles, strategic goals and tasks for biodiversity conservation in China in the next two decades. It has also identified 35 priority regions for biodiversity conservation (Figure 2.1) across China, as well as proposed 10 priority areas, 30 priority actions and 39 priority projects for implementation.

The updating of NBSAP took more than three years. In this process, many thematic studies were undertaken, and many working meetings, consultations and international workshops were held. Consultations were also undertaken with more than 20 central government departments and 31 provincial governments. Therefore the development of this updated NBSAP was a very participatory process by having involved a wide range of stakeholders. It is a result of the joint efforts of the members of China's Coordinating Group for Implementation of the Convention on Biological Diversity and the Inter-ministerial Joint Conference on Conservation of Biological Resources. It is also an example of cooperation between domestic and international institutions or organizations.

China had developed its first NBSAP as early as 1994. Due to its early development, the first NBSAP did not cover some important provisions of the Convention, in particular its third objective (fair and equitable sharing of benefits from use of genetic resources). A few other issues that had emerged after the entry into force of the Convention such as invasive alien species, access to and benefit-sharing from use of genetic resources and associated traditional knowledge and biosafety management of genetic modified organisms (GMOs) were not appropriately addressed in the first NBSAP. In addition the first NBSAP did not really contain national strategies. Therefore the Government of China proposed a new national biodiversity strategy and action plan under the new circumstances, as required by social and economic development in China and the international obligation of biodiversity conservation. The updated NBSAP has identified three major goals for three periods of time as well as 35 priority regions for conservation. Relevant strategies have been added and issues such as invasive alien species, climate change, access to and benefit-sharing from use of genetic resources, traditional knowledge and biosafety management of GMOs have been addressed. The development and implementation of the updated NBSAP will produce positive and far-reaching impacts on biodiversity conservation in China and even in the world.

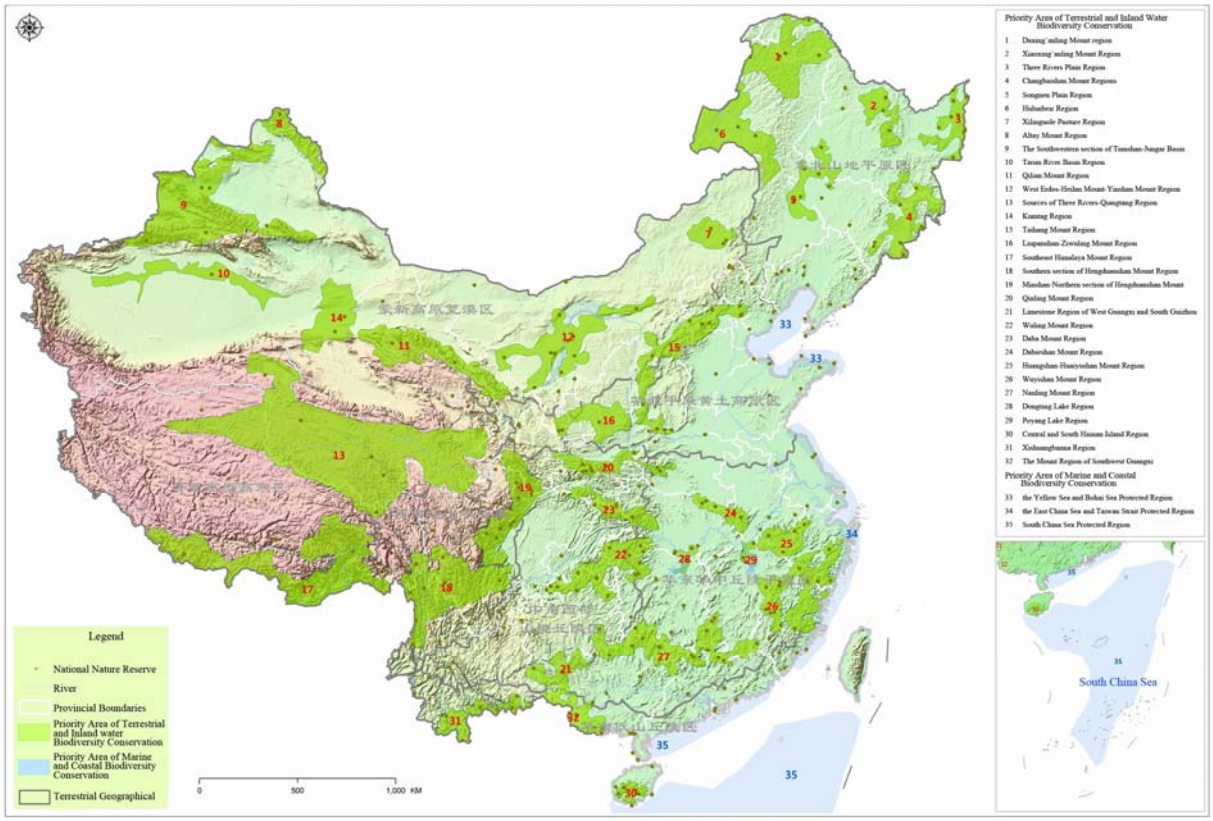


Figure 2.1 35 Priority Regions for Biodiversity Conservation

2.2 National Targets for Biodiversity Conservation

The tenth meeting of the Conference of the Parties held in Japan in October 2010 adopted the Strategic Plan for Biodiversity (2011-2020), which identified 2020 Biodiversity Targets (also called "Aichi Targets", hereafter "2020 Targets"). These targets provided roadmaps and time tables for biodiversity conservation in the world as well as a flexible framework for setting national targets. The 2020 Targets consist of 5 strategic goals and 20 specific targets (Table 2.1).

At the end of 2010 the State Council issued National Plan for Major Function Zones, which divides the country's land into four major function zones, i.e. zones for priority development, zones for key development, zones for limited development and zones prohibited for development. 25 key ecological function zones have been included in those for limited development. Large-scale and high-intensity industrial and urbanization development activities will be limited within these zones to allow for the conservation and restoration of the environment and to provide ecological goods and ecosystem services. Meanwhile, national-level nature reserves, world natural and cultural heritages, national scenic spots, national forest parks and geological parks have been included in those zones prohibited for development, where industrial and urbanization development activities will be prohibited to protect China's natural and cultural resources and genetic resources of rare animals and plants.

The Eighteenth National Congress of the Chinese Communist Party held in November 2012 laid out a blueprint for building an ecological civilization, and adopted a grand vision of "Building Beautiful China". The meeting also proposed that priority would be given to building an ecological civilization by integrating it with various aspects and processes of economic, political, cultural and social developments. The meeting required that in doing so the principles below should be followed:

- Continuing to implement the fundamental national policy of environmental protection and resource conservation;
- Giving priorities to conservation, protection and natural restoration;
- Promoting green, cycling and low-carbon development;
- Creating resource-efficient and environmentally friendly spatial layouts, industrial structures, production and consumption patterns as well as lifestyles to reverse the environmental worsening trends at source.

The updated NBSAP proposed the following fundamental principles: (a) conservation as a priority; (b) ensuring sustainable use; (c) public participation; (d) benefits for all. The plan has identified the short-term (2015), mid-term (2020) and long-term (2030) goals (Table 2.1). Though the updated NBSAP was launched before the tenth meeting of the Conference of the Parties held in 2010 adopted the Strategic Plan for Biodiversity 2011-2020, its development had fully considered goals and tasks contained in the draft Strategic Plan for the post-2010 period.

The vision and strategic goals that the Government of China had proposed for building an ecological civilization and Beautiful China, together with the updated NBSAP, have formed a relatively comprehensive set of national targets for biodiversity conservation in China (Table 2.1). However there are no specific national targets in line with Aichi Targets 7,9,10, 13, 16 and 19, and effective measures and means to achieve these targets are lacking. Therefore the Government of China should give more attention to addressing issues such as agricultural and forest sustainable development, prevention and control of invasive alien species, protection of genetic resources and benefit-sharing from their use, addressing climate change impacts on coral reefs and other vulnerable ecosystems. Meanwhile China needs to further increase its investment in research, development and application of science and technologies for biodiversity conservation.

Table 2.1 2020 Global Biodiversity Targets and China's National Targets

Strategic Plan for Biodiversity 2011-2020	National Goals and Targets	Sources of Information
The vision of this Strategic Plan is a world of "Living in harmony with nature" where "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."	**Long-term Goal:** by 2030, biodiversity will be effectively protected. **2020 Goal:** by 2020, biodiversity loss will be basically controlled. **2015 Goal:** by 2015, biodiversity	Updated NBSAP (c)

The mission of the Strategic Plan is to "take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach."	decline in key regions will be effectively contained.	
2020 Global Biodiversity Targets (Aichi Targets)		
Target 1:By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	● Practical efforts will be made in environmental education and communication, popularizing environmental knowledge and increasing public environmental awareness. ● By 2030, biodiversity conservation will become voluntary action of the public.	National Programme for Environmental Education and Communication (2011-2015) (d) Updated NBSAP (c)
Target 2:By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	● Resource consumption, environmental damage and ecological benefits will be incorporated into the system of assessing social and economic development, and a system of goals and targets, as well as related assessment methods and reward/penalty mechanisms that meet requirements for building an ecological civilization will be established.	Report of Eighteenth National Congress of the Chinese Communist Party (a)
Target 3:By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied,	● Establishment of mechanisms for ecological compensation and increasing fiscal transfers to key ecological function zones will be accelerated; and studies will be undertaken on the establishment of national specialized funds for ecological compensation and the system of reserves for sustainable	National 12th Five-Year Plan for Social and Economic Development of the People's Republic of China (b)

consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	development of resource-efficient enterprises will be promoted.	
Target 4:By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	● By 2015 considerable progress will be made in building a resource-efficient and environmentally friendly society. ● Efforts will be made to promote spatial layouts, industrial structure, production and consumption patterns and lifestyles that promote green, recycling and low-carbon development, natural resources conservation and the environmental protection.	National 12th Five-Year Plan for Social and Economic Development (b) Report of 18th CPC National Congress (a)
Target 5:By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	● By 2015, forest coverage rate will be increased to 21.66% and forest reserves will be increased by 600 million m^3 over that in 2010. ● By 2020, grassland degradation trend will be basically contained and grassland ecological environment will be obviously improved. ● By 2020, the environmental and ecological worsening trends in coastal and near-shore areas will be fundamentally reversed and marine biodiversity decline trend will be basically contained. ● By 2020, aquatic environment and ecology will be gradually restored and decline of fishery resources and increase in endangered species will be basically contained.	National 12th Five-year Plan for Social and Economic Development (b) National Master Plan for Conservation and Use of Grasslands (c) National Twelfth Five-year Plan for Marine Development (c) National Programme of Action for Conservation of Aquatic Species (c)
Target 6:By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant	● By 2020, aquatic environment and ecology will be gradually restored and decline of fishery resources and increase in endangered species will be basically contained. ● By 2020, the environmental and ecological worsening trends in coastal and near-shore areas will	National Programme of Action for Conservation of Aquatic Species (c) National Twelfth Five-year Plan for Marine

adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	be fundamentally reversed and marine biodiversity decline trend will be basically contained.	Development (c)
Target 7:By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	● By 2020, national forest holdings will exceed 2.33 million km^2, an increase 223,000 km^2 over that of 2010; and national forest reserves will be increased to 15 billion m^3, an increase of about 1.2 billion m^3 over that of 2010. ● By 2020, husbandry production pattern will be changed and grassland sustainability will be effectively enhanced. ● By 2020, fishing capacities and outputs will be generally consistent with carrying capacities of fishery resources.	National Programme for Conservation and Use of Forestland 2010-2020 (c) National Master Plan for Conservation and Use of Grasslands (c) National Programme of Action for Conservation of Aquatic Biological Resources (c)
Target 8:By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	● By 2015 the total amount of emission of main pollutants will be significantly reduced, with COD and SO_2 reduced by 8%, and ammonia and NOx reduced by 10% compared with the levels of 2010. ● By 2020, energy consumption and CO_2 emission per unit of GDP will be reduced significantly, with the total amount of main pollutants considerably reduced.	National Twelfth Five-year Plan for Social and Economic Development (b) Report of 18th National Congress of CPC (a)
Target 9:By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	● By 2020, forest pest disaster rate will be controlled at 4%.	National Plan for Forest Pest Control 2011-2020 (d)
Target 10:By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	● By 2020, energy consumption and CO_2 emission per unit of GDP will be reduced significantly. ● By 2020, a system of nature reserves with reasonable layouts and comprehensive functions will	Report of 18th National Congress of CPC (a) Updated NBSAP (c)

	be established, with functions of national-level nature reserves stable, and main targets of protection effectively protected.	
Target 11:By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	● By 2015, the total area of terrestrial nature reserves will be maintained at 15% or so of the country's land area, protecting 90% of national key protected species and typical ecosystem types. ● The percentage of the area of marine protected areas out of the marine areas under China's jurisdiction will be increased from 1.1% in 2010 to 3% in 2015. ● By 2020, the total area of marine protected areas will exceed 5% of the marine areas under China's jurisdiction, with the area of coastal marine protected areas exceeding 11%. ● By 2020, a system of nature reserves with reasonable layouts and comprehensive functions will be established, with functions of national-level nature reserves stable, and main targets of protection effectively protected.	Updated NBSAP (c) National Twelfth Five-year Plan for Marine Development (c) National Marine Zoning Plan 2011-2020 (c) Updated NBSAP (c)
Target 12:By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	● By 2015, more than 80% of endangered species whose wild populations are very small and for which *in-situ* conservation capacities are inadequate will be effectively protected. ● By 2020 functions of national-level nature reserves will be maintained stable, and main targets of protection effectively protected. ● By 2020, the majority of rare and endangered species and populations will be restored and reproduced, relieving the situation of species endangerment.	Updated NBSAP (c) National Programme for Conservation and Use of Biological Resources (c)
Target 13:By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives,	● By 2020, biodiversity loss will be basically contained, and a system of nature reserves with reasonable layouts and comprehensive functions will be established, with	Updated NBSAP (c)

including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	main targets of protection effectively protected. ● National List of Protection of Livestock Genetic Resources will be revised so as to accord key protection to rare and endangered livestock genetic resources in the list and ensure that protected varieties will not be lost and their economic values will not be decreased.	National Twelfth Five-year Plan for Conservation and Use of Livestock Genetic Resources
Target 14:By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	● By 2020, the stability of ecosystems will be strengthened, and the human environment will be considerably improved. ● By 2020, grass-herd balance will be achieved in natural grasslands, grassland habitats will be obviously restored and grassland productivity will be significantly enhanced. ● By 2020, the environmental degradation of the coastal and near-shore marine areas will be reversed, and decline of marine biodiversity will be basically contained.	Report of 18th National Congress of CPC (a) National Master Plan for Conservation and Use of Grasslands (c) National Twelfth Five-year Plan for Marine Development (c)
Target 15:By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	● By 2020, forest areas will be increased by 52,000 km^2 over that in 2010, and forest reserves net increased by 1.1 billion km^2 over that in 2010, and forest carbon sinks by 416 million tons. ● By 2020, the total areas of control of degraded grasslands will exceed 1.65 million km^2, with grassland habitats obviously restored and grassland productivity significantly enhanced. ● By 2020, the aquatic environment and ecology will be gradually restored.	Plan for Second-Phase of Project on Natural Forest Resources Protection (c) National Master Plan for Conservation and Use of Grasslands (c) National Programme of Action for Conservation of Aquatic Biological Resources (c)
Target 16:By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits	● By 2020, the system of access to genetic resources and benefit-sharing from their use will be improved.	Updated NBSAP (c)

Arising from their Utilization is in force and operational, consistent with national legislation.		
Target 17:By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	Updated NBSAP has been promulgated.	
Target 18:By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	● By 2020, documentation of relevant traditional knowledge within China and the intellectual rights protection system will be further improved.	National Programme for Conservation and Use of Biological Resources (c)
Target 19:By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	● By 2020, the percentage of investment in research and development activities will exceed 2.5% of national GDP, with contributions from science and technology to GDP reaching 60%, and the number of annual patent grants to the Chinese individuals and groups and of citations of academic papers by international journals ranking top five in the world. ● Environmental education will be undertaken to popularize environmental knowledge and increase public environmental awareness.	National Mid and Long-term Plan for Science and Technology Development 2006-2020 (c) National Programme of Action for Environmental Education 2011-2015 (d)
Target 20:By 2020, at the latest, the mobilization of financial resources for	● Channels of investment will be broadened and investments from local and central governments will	Updated NBSAP (c)

effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	be increased and financing from the banking sector, international donors and the civil society will be attracted to biodiversity conservation, with diverse financing mechanisms established.	

Note: a: docs approved by National Congress of Chinese Communist Party; b: docs approved by National People's Congress; c: docs approved or issued by the State Council; d: docs promulgated by six relevant government departments including the Ministry of Environmental Protection.

2.3 Main Actions to Implement the Convention on Biological Diversity

2.3.1 Laws and regulations

The Government of China has promulgated in recent years a number of new laws and regulations such as Island Conservation Law and Regulation on Protection of New Plant Varieties, in addition to more than 50 existing laws and regulations related to biodiversity. China has developed and launched a series of national, sectoral and local standards for biodiversity conservation. All this has further improved the legal and regulatory system for biodiversity conservation and use.

2.3.2 Cross-sectoral working mechanisms

To implement the Convention on Biological Diversity, the State Council has approved the establishment of China's Coordinating Group for Implementation of the Convention on Biological Diversity, headed by the Ministry of Environmental Protection and composed of 24 departments. CBD Implementation Office was established in the Ministry of Environmental Protection. To strengthen conservation and management of biological resources, the State Council has also approved the establishment of an Inter-ministerial Joint Conference on Conservation of Biological Resources, headed by the Ministry of Environmental Protection and composed of 17 ministries and commissions. An office for this joint conference was established in the Ministry of Environmental Protection. To organize celebration activities for the International Year of Biodiversity in 2010, the Government of China established National Committee for the International Year of Biodiversity (2010), headed by one of the Vice Premiers of the State Council responsible for the environment and composed of 25 departments. In 2011, the State Council decided to change this Committee into National Committee on Biodiversity Conservation. This Committee consists of 25 departments and the Secretariat of this Committee was established in the Ministry of Environmental Protection. These three implementation coordination bodies headed by MEP and participated by relevant departments are mutually

supportive while exercising their unique, important roles in enhancing biodiversity conservation in China.

Most provincial and municipal governments have also strengthened their biodiversity-related departments or institutions such as those responsible for agriculture, the environment, forestry and marine management, as well as established inter-departmental coordinating mechanisms.

Case 2.1 Biodiversity Conservation in Yunnan Province: From Northwest Yunnan to Whole Province

Yunnan is one of the provinces with richest biodiversity in China. Northwest Yunnan is located in the transition zone between Qinghai-Tibet Plateau and Yunnan-Guizhou Plateau, and has been therefore identified one of the priority areas for biodiversity. It covers 18 counties (cities or districts) in Yunnan Province. To strengthen biodiversity conservation in northwest Yunnan, in February 2008, the People's Government of Yunnan Province held a meeting in Lijiang on biodiversity conservation in northwest Yunnan. The meeting developed a number of recommendations and adopted a declaration. Subsequently the Government of Yunnan Province developed a programme and an action plan for biodiversity conservation in northwest Yunnan. The province also established a mechanism of joint conference of relevant departments for biodiversity conservation. In May 2010 this joint conference as well as a forum on Yunnan Actions for the International Year of Biodiversity (IYB) was held in Tengchong, where a programme of action for 2010 IYB was declared. Yunnan has also established a Biodiversity Fund and an Institute of Biodiversity. In April 2012 Yunnan held another joint conference in Xishuangbanna where an agreement was reached for biodiversity conservation in Yunnan Province and ten measures were proposed to enhance biodiversity conservation. In 2013, Yunnan Province approved and issued its Biodiversity Strategy and Action Plan (2012-2030). This document provides strategic guidance for biodiversity conservation in Yunnan in the next two decades. From the Lijiang Declaration, Tengchong Programme of Action, Xishuangbanna Agreement and Yunnan Provincial Biodiversity Strategy and Action Plan, Yunnan has been putting more and more efforts into its biodiversity conservation.

During the eleventh five-year plan period, various departments of Yunnan had invested cumulatively a total of nearly 7 billion yuan RMB into biodiversity conservation and sustainable use. Since the twelfth five-year plan period began, Yunnan has been increasing its investment into biodiversity conservation. Yunnan Biodiversity Fund has received a donation of 32.3 million yuan RMB. In March 2013, the Government of Yunnan Province has established a specialized fund for biodiversity conservation totaling 50 million yuan RMB, with allocations from the province's budget.

Case 2.2 Sichuan Provincial Biodiversity Strategy and Action Plan(2011-2020)

Sichuan Province is located in the upper reaches of the Yangtse River, and one of the world's 25 biodiversity hotspots. Sichuan's formulation and implementation of its BSAP is significant for implementing the Convention on Biological Diversity in China. With the support of the Ministry of Environmental Protection, UNDP and The Nature Conservancy, Sichuan Environment Department and Forest Department, together with other relevant departments, initiated in 2007 the development of PBSAP. It took more than two years to complete PBSAP as a result of joint efforts of relevant departments, institutions and experts involved, following many studies, surveys and consultations. This PBSAP was approved at the 89th session of Sichuan Province Government in December 2011.

This PBSAP for the first time identified 13 priority areas for biodiversity conservation in the province, 9 priority areas for actions (such as developing regulations and policies, establishing baseline information, protecting wild species and their habitats, monitoring and strengthening research on conservation etc.) as well as 46 priority actions.

At present, relevant departments of Sichuan Province are effectively promoting implementation of this PBSAP, and making great efforts in establishment of biodiversity information system, biodiversity recovery following the earthquake in Wenchuan, and rescuing rare, endangered wild species.

2.3.3 Survey and monitoring

(1) Inventorying national forest resources. National forest resources consensus is undertaken at province level every five years. Sampling techniques are used to select 415,000 fixed sites on the ground and 2.84 million sample sites using remote-sensing. Consensus is undertaken to get the current status of forest resources including dynamic changes in all provinces (autonomous regions and province-level municipalities) with surveys undertaken at the same time following the same procedures and requirements. The consensuses have generated rich results, intensive information and reliable data, and therefore are considered the most authoritative data that reflect the status of forest resources at national and province level. So far China has undertaken seven consensuses on forest resources. During 2009-2013 China conducted the eighth consensus and its result will be launched shortly.

(2) Biodiversity survey. From 2006 to 2008, China undertook a survey of coastal and near-shore marine species, which helped get the baseline data on marine biological resources. As a result "China's Marine Species and Atlas" was published, which includes more than 28,000 marine species and pictures of more than 18,000 species.

Surveys were also undertaken of plant, animal and microorganism diversity in key regions, including Pan-Himalaya region, Qinghai-Tibet Plateau, Xinjiang, Luoxiao Mountain Range, hilly areas of south China, areas in southwest China inhabited by ethnic minorities, ecologically sensitive areas in plains and hills along

coastal areas in southeast China, tropical islands and coastal areas, the Yangtse River Basin, arid areas in northwest China, the Loess Plateau, Major and Minor Xing'anling Mountains in northeast China, and grasslands in northeast China. From 2011 to 2012, systematic wild surveys were undertaken of biological resources in 26 counties (cities and districts) of Yunnan, Guangxi and Guizhou Provinces. These surveys resulted in discoveries of 19 new (or probably new) plant taxa, three new records of distribution in China and 49 new records of distribution at provincial level.

During the eleventh five-year plan period, a second national survey on livestock genetic resources was undertaken, and "Annals of China's Livestock Genetic Resources" was published. The survey showed that 15 local varieties of livestock genetic resources were no longer found, and the populations of more than a half of local varieties took a downward trend.

Since 2009, China has organized a second national survey on all wetlands with area above 8 ha, by using 3S technologies and following the criteria set by the Ramsar Convention.

In addition China had undertaken a remote-sensing survey and assessment of ecological changes in the decade from 2000 to 2010 as well as a survey on agricultural biological resources. China is now undertaking a number of surveys, including a second survey on key wild animals, a second survey on national key protected wild plants, the fourth survey on habitats for Giant Pandas and a pilot consensus on Chinese medicinal resources.

(3) Biodiversity monitoring. A proposal has been developed for establishing a national network of biodiversity monitoring based on stratified sampling. Technical guidelines have been developed for monitoring plants, mammals, birds, amphibians and reptiles, fishes, soil animals, butterflies and large fungi. Training activities were also organized on monitoring techniques.

China Forest Biodiversity Monitoring Network (CForBio) (http://www.cfbiodiv.org) was established in 2004, covering different types of forest vegetation at different latitudes, including coniferous and broad-leaved mixed forests, deciduous forests, evergreen deciduous and broad-leaved mixed forests, ever-green broad-leaved forests and tropical rainforests. By 2012, CForBio has covered 12 major monitoring sites, with each site covering an area ranging from 9 to 25 ha.

Since 2011, China has been undertaking pilot monitoring of birds and amphibians. More than 200 monitoring sites have been established in different regions and ecosystems, with more than 450 line transects and more than 430 point transects established.

Since 2004, China has established 18 marine ecological monitoring zones in a

number of ecologically vulnerable and sensitive coastal and near-shore areas, and been undertaking systematic biodiversity monitoring, assessment and conservation in these zones. The area being monitored has reached 52,000 km^2, including typical marine ecosystems such as bays, estuaries, coastal wetlands, coral reefs, mangroves and sea grass beds.

Since 2005, China has established an ecological monitoring system at sources of three major rivers in Qinghai Province. This system includes 5 ecological monitoring systems, 14 ecological monitoring stations, 486 on-the-ground monitoring points, 3 soil conservation monitoring communities, 2 mobile monitoring stations of hydrological resources and 2 automatic meteorological stations.

China has been monitoring 15 protected sites of wild plants, and has obtained relevant data for five consecutive years.

(4) Biodiversity assessments. During 2007-2012, China completed its national biodiversity assessment. This assessment was undertaken at county level, and as a result for the first time data have been collected of county-level distribution of 34,039 vascular plants and 3,865 wild vertebrates. Based on that a national biodiversity information system has been established, with almost all the information concerning the status, spatial distribution and main threats of terrestrial biodiversity covered. In addition, through this assessment national biodiversity hotspots and major gaps in conservation have been identified, having preliminarily resolved the difficult situation that China did not know its own biodiversity status for long. China has developed a set of indicators for assessing the health, functions and values of ecosystems in order to evaluate scientifically and accurately the status of the ecosystems.

2.3.4 *In-situ* Conservation

A conservation system has been established, primarily composed of nature reserves and complemented by scenic spots, forest parks, community-based conservation areas, protected sites of wild plants, wetland parks, geological parks, special marine protected areas and germplasm conservation areas. By the end of 2013, a total 2,697 nature reserves of various categories have been established at different levels, covering about an area of 1.463 million km^2 and accounting for about 14.8% of the country's land area. Among them, there are 407 national-level nature reserves, covering an area of about 940,000 km^2 which accounts for 64.3% of the total area of nature reserves and 9.8% of the country's land area. Since 2008 the number of marine protected areas in particular national-level MPAs has increased substantially. By the end of 2012, more than 240 marine protected areas of various types have been established at different levels, with the total area covering 87,000 km^2, accounting for nearly 3% of the marine areas under China’s jurisdiction.

Case 2.3 Compulsory Conservation Model of Wuyi Mountain

Wuyi Mountain has the most complete, most typical and the biggest area of subtropical forest ecosystem compared with those located at the same latitude of the world. It was included the World's Heritages List in December 1999. Through innovative approaches described below, a new sustainable development model has been established in Wuyi Mountain, which is "using ecological industry development in 10% of its area in exchange for biodiversity conservation in 90% of its area".

(a) Strengthening regulatory development and promoting regulation of tourism industry. A few regulations have been promulgated, such as rules on management of scenic spots in Wuyi and provisional rules on management of Jiuqu Stream in Wuyi Mountain. The implementation of these regulations has significantly promoted ecological conservation and sustainable tourism development in Wuyi Mountain.

(b) Setting up a joint mechanism for conservation and establishing a complete system of conservation. A joint conservation committee was established composed of governments of all levels and local communities. A joint 200-km-long protection line was established around protected areas, and 272 forest guards were hired and nearly 10% of residents in local communities were directly involved in conservation and management. Specialized forest fire fighting team and police patrolling points were established. As a result of joint efforts of all stakeholders involved, no forest fires, no illegal crimes and no major forest pest happened in the past 25 years. Wuyi has become a national example in this regard.

(c) Adopting compulsory conservation measures in "ecologically significant areas" for harmony between conservation and development. In recent years 10% of the total area of protected areas has been set aside as "production areas", in which local people can grow bamboo, tea and bee and develop ecologically friendly industries consuming less natural resources. Meanwhile measures have been taken to ensure that forests and biodiversity in 90% of the area will be effectively protected. This model has been praised by UNESCO as "a successful example of addressing conflicts between development and conservation in China's protected areas". The forest coverage rate in the protected area has increasing from 92.1% initially to 96.3% currently, with win-win for both development and conservation.

(d) Setting up a research platform to demonstrate achievements in biodiversity conservation. In 2010, one-decade-long survey results were digitalized, and on that basis a biodiversity research and information platform was set up, which is relatively complete in China. The platform uses and integrates database, GIS, virtual animation, audio and visual techniques to demonstrate a complete and vivid picture of the distribution of rare animals and plants in Wuyi Mountain. The platform plays an important role in supporting biodiversity research and education.

Case 2.4 Huangshan Mountain Model-Conservation through Enclosing and Alternating Opening Scenic Spots

Huangshan Mountain was listed as one of the world's natural and cultural heritages by UNESCO in December 1990. It was also selected as one of the candidates for the world geological park in February 2004. It is one of the first 5A national tourism areas in China. Huangshan Mountain Tourism Administration used enclosing and alternating opening of scenic spots as entry point to explore a new model of sustainable development by combining the proper use and conservation of the world heritage.

(a) Strengthening regulations concerning management of scenic spots. Anhui Province People's Congress and relevant provincial government departments adopted a regulation on management of Huangshan Mountain scenic spot, a master plan for Huangshan scenic spot for 2007-2025, and an environmental plan for Huangshan Mountain scenic spot. These regulations and plans standardize the development of the scenic spot.

(b) Introducing the practice of alternating opening scenic spots. Protection measures have been taken in main scenic spots such as Tiandu Mountain, Lianhua Mountain and Shixin Mountain, such as enclosing and alternating opening these spots for 2 to 4 years.

(c) Introducing a new model of providing services to tourists. Since 2007, Huangshan Mountain Tourism Administration has moved its offices and staff housing facilities out of the mountain to minimize impacts on the scenic spots. For energy use in the core scenic spots electricity is mainly used, with LG as supplementary.

(d) Establishing an effective mechanism for investment into conservation. Specialized funds established for heritage protection, with contribution from 10% of entrance ticket sales. During 2007-2011, the cumulative investment into heritage protection exceeded 600 million yuan RMB.

(e) Strengthening international cooperation and exchange. In 2008, World Tourism Organization set up a monitoring station in Huangshan Mountain of sustainable tourism development of world heritages. Since 2009, Huangshan Mountain has joined a number of tourism and conservation organizations, such as IUCN, Global Sustainable Tourism Council (GSTC), World Tourism and Travel Council (WTTC) and Asia-Pacific Tourism Association (PATA). In 2010, Huangshan Mountain was awarded by WTTC the prize for management of global tourism destinations. At the end of 2011, as the only candidate from Asia, Huangshan Mountain was included as one of the first experimental zones for sustainable tourism development in global tourism destinations, and developed standards for sustainable tourism in global tourism destinations, together with experts from relevant international organizations.

Case 2.5 Model of Coordination between Nature Conservation and Economic Development in Dujiangyan, Sichuan Province

The City of Dujiangyan is in mountain areas located at the western side of the Sichuan Basin, (its northern latitude is 30°45′～31°22′ and longitude is 107°25′～107°47′) covering an area of 1,208 km^2. Dujiangyan has various types of topography, with big differences in altitudes, heavy cloudiness and moisture, little sunshine and short frosty period. The forest coverage rate in 2003 was 50.1% and increased to 58.9% in 2012.

The City of Dujiangyan attaches high importance to biodiversity conservation. In 1992 the city established a protected area in Longxi-Hongkou covering an area up to 310 km^2, with neighboring towns and communes identified as buffer zones, covering an area of 117 km^2. In 1993 this protected area was upgraded to a province-level PA and again to a national-level PA in 1997. In 2003, the city developed a municipal biodiversity strategy and action plan, with the support of UNDP, UN Foundation, FFI International and the Biodiversity Working Group of China Council for International Cooperation on the Environment and Development (CCICED). This BSAP provided guidance for biodiversity conservation and promoting coordinated social and economic development at local level. In 2006, land covering an area of 195 km^2 from Qingchengshan and Zhaogongshan within the city was included as part of the international natural heritage for Giant Pandas in Sichuan. So far land of 622 km^2 within the city has been included as strictly protected areas, with the target set in local BSAP having been achieved.

The city forest department and Longxi-Hongkou PA Administration have been strongly supporting rural economy development in mountain areas by helping local farmers establish a number of rural economic cooperation organizations, such as Cooperatives for Medicinal Materials, Cropping and Cultivation in Forests and Wild Edible Vegetables in Mountains. In addition they also helped with multiple businesses in forestlands so as to reduce damage to forest resources. The Cooperative for Medicinal Materials currently has membership of more than 2,300 households, covering an area of more than 100 km^2 and output value exceeding 600 million yuan RMB.

Dujiangyan City develops tourism based on its natural resources, with income from tourism having reached 7.74 billion yuan RMB. Hongkou Commune in the buffer zone of Longxi—Hongkou PA started organizing tourism activities in the buffer zone since 2000, and upgraded it to a quadruple-A scenic spot in 2011. In 2013 a total of 723,000 tourists were received and income of 86.04 million yuan RMB generated from tourism.

Local farmers living in the buffer zones organize tours to rural areas using the good environment in the PA and the buffer zones. So far 192 operators have begun their business in such tours. These tour operators and their employees have changed from their traditional way of living by cultivation, harvesting and logging to organization of rural area tours. The income per capita in 2012 has reached 10,542 yuan RMB. Meanwhile, higher income level brings about change in awareness and as a result many farmers have voluntarily participated in nature conservation activities.

By the end of 2012, China has established 2,855 forest parks, covering a total area of 174,000 km^2. Among them there are 764 national-level forest parks and 1,315 province-level forest parks. 225 national-level scenic spots have been established, covering an area of 104,000 km^2, and 737 province-level scenic spots established, covering an area of about 90,000 km^2. Areas with both combined account for 2% of China's land area. More than 50,000 community-based conservation areas have been established, covering an area of over 15,000 km^2. 179 protected sites of various wild plants have been established. 468 wetland parks have been established. From 2007 to 2012, 368 national-level aquatic germplasm conservation areas have been established, covering an area of more than 152,000

km^2.

Nature reserves have become key zones among China's major ecological function zones, and constitute main parts of "banned development zones". They have effectively protected 90% of terrestrial ecosystem types, 85% of wild animal populations and 65% of higher plant biota in China. They have also covered 25% of primitive and natural forests, more than 50% of natural wetlands and 30% of typical desert regions, thus playing a crucial role in maintaining ecological security and promoting sustainable social and economic development of China.

2.3.5 *Ex-situ* conservation (including genetic resources)

(1) Botanical gardens and zoos. Botanical gardens are main bases for implementing *ex-situ* conservation of plant species. In accordance with incomplete statistics, so far China has established 200 botanical gardens of various kinds at different levels, having collected and stored over 20,000 plant species, two-thirds of China's flora. China has also established over 400 conservation and breeding sites for wild plant germplasms, as well as conservation centers for cycads and orchid germplasms, which have collected more than 240 varieties of cycads and 500 varieties of orchids respectively. According to incomplete statistics, China has established more than 240 zoos (including animal demonstration areas) and 250 rescuing and reproduction sites for endangered wild animals.

(2) Genetic resources of crops. By December 2012, the total of 423,000 accessions of agricultural crops have been collected in China, an increase of about 30,000 accessions over those in 2007. China has reinforced the construction of storage facilities to ensure that collected genetic resources are well stored. On one hand China has expanded or renovated a few existing facilities, including one national long-term storage bank, one national duplicates bank, 10 national mid-term storage banks, 32 national germplasm nurseries (including 2 plantlets libraries). On the other hand, China has built 7 new national germplasm nurseries, as well as core germplasm banks for genetic resources of important crops. So far China has built core germplasm banks for rice, wheat, maize, soybeans, cotton, barley and millet, and mini core germplasm banks for rice, wheat, maize and soybeans, with a large number of important functional genes discovered.

(3) Forage germplasm. A system of conservation and use of forage germplasm has been preliminarily established, with the amount, varieties, distribution and use of forage germplasm known to varying extent. China has established 2 mid-term banks, 8 to 10 short-term storage banks and 5 germplasm nurseries, which store more than 240,000 accessions of germplasm, with 18,783 accessions verified. All this provides a basic condition for *ex-situ* storage of forage germplasm and their genetic diversity.

(4) Livestock genetic resources. A system of conservation of livestock genetic resources has taken shape, composed primarily of conservation farms and complemented by protected areas and gene banks. The system provides key protection to 138 rare and endangered varieties of livestock. As a result of implementation of the good breed selection project, China has established and expanded more than 120 key conservation farms, protected areas and gene banks. As a result of the implementation of the project on protection of livestock germplasm resources, more than 100 local varieties have been effectively protected every year, and molecular-level assessments of genetic resources have been undertaken. By the end of August 2012, China has established 150 national-level gene banks, conservation areas and farms.

(5) Forest germplasm. Analysis and assessment has been undertaken of the genetic diversity and variation of nearly 100 key tree species such as cedar, pine, poplar, arborvitae, spruce, birch, Mongolian oak, liriodendron, fagus, alder, amine tree, plum flower, bloom, clove, peony and bamboos. As a result important information concerning genetic variations and distribution of these tree species has been obtained, and strategies have been developed for genetic improvements and storing forest germplasm. 31 provinces, 295 cities (regions) and 1,569 counties (cities) have established tree seedling management stations or bodies to manage forest germplasm, thus forming a relatively complete system of forest germplasm management. A number of *ex-situ* storage banks particularly for forest germplasm have been established, which store more than 2,000 species, over 120 of which are key tree species. Currently a national programme is under development for collection, storage and use of forest germplasm, which will provide guidance for forest germplasm conservation.

(6) Germplasm of wild biological resources. By the end of 2012, China Southwestern Germplasm Bank of Wild Species has collected and stored 76,864 accessions of seed materials of 10,096 plant species, 9,123 accessions of non-seed *in-vitro* reproductive materials of 844 plant species and 45,980 accessions of active plant materials of 437 species. The bank has also collected and stored 13,805 accessions of animal germplasms of 354 animal species, mainly those of rare and endemic wild vertebrate species, as well as 330 accessions of 319 species of large fungi, 8,235 accessions of 815 species of micro-organism germplasms and 12,155 pieces of DNA materials of 1,311 species.

(7) Marine genetic resources. China has established a germplasm bank of marine species. The big seaweed germplasm bank located in China Ocean University has collected and stored nearly 500 stems of seaweed germplasm of 60 species. China National Storage Center of Marine Micro-organism Strains located in the Third Institute of Oceanography under the State Ocean Administration has stored more than 14,000 strains of bacteria. Genetic grouping or sequencing has been undertaken. In July 2010 Chinese scientist announced that they had completed a whole genome sequence map of oysters, which is the world's first such map of shellfish. Meanwhile

Chinese scientists also announced completion of a whole genome sequence map of gunther, which is also the world's first such map of flounder fishes.

2.3.6 Key ecological projects

Key ecological projects continued to be implemented, such as natural forest resources protection, returning cultivated land to forest, construction of forest belts in north, northeast and northwest China as well as in the Yangtse River Basin, control of origins of sandstorms affecting Beijing and Tianjin and control of desertification in rocky Karst areas. Since 2001, ecological conditions of key project regions have improved obviously. Forest resources across the country have increased constantly, with reforestation area increased by 482,000 km^2 and forest coverage area increased by 23.0% over that of a decade ago. The current forest coverage rate has reached 20.4%, 3.8% increase over that of a decade ago. The forest reserves have reached 13.72 billion m^3, 21.8% increase over that of a decade ago. These projects have also enhanced restoration of habitats of wild species and the rise in the population and number of species.

The project of returning grazing land to natural grasslands has been implemented. Since the beginning of the project in 2003, by 2012, grassland fences covering an area of 606,000 km^2 have been established, among them, 262,000 km^2 for grazing ban fences, 317,000 km^2 for fences for temporarily stopping grazing, 27,000 km^2 for alternating grazing and 153,000 km^2 for reseeding seriously degraded grasslands. The average vegetation rate in the project implemented areas is 64%, 12% higher than that of the non-project areas. The fresh grass output per *mu* in the project areas has reached 212 kg, 70% or so higher than that from the non-project areas. Vegetation structure is gradually stabilizing with biodiversity being improved and good-quality grass percentage obviously going up.

Great efforts were put into soil conservation projects in some key regions. During the period from 2009 to 2012, such control projects were implemented in a total of 12,000 small river basins, covering an area of 270,000 km^2. Enclosing for soil conservation continued, with total enclosed area having reached 720,000 km^2. Among them, ecological conditions in areas of 450,000 km^2 have been restored to some extent. This impact of enclosing is increasingly obvious in sources of three major rivers in Qinghai, river basins in Xinjiang and Tibet, while the ecological functions of these areas are effectively protected.

205 wetland protection and restoration projects have been implemented since 2006. A number of wetlands of international and national importance have been rescued, with rate of protection of natural wetlands increased by 1% annually. More than a half of natural wetlands have been effectively protected. The capacities for wetland protection and management have been obviously strengthened and livelihood in wetland project areas has further improved.

Ecological restoration and re-construction in coastal and marine areas has been undertaken. Work is on-going to restore and reconstruct coastal weed wetlands, mangroves, coral reefs, sea grass beds and Suaeda wetlands. Since 2010 a total investment of nearly 3.875 billion yuan RMB (from marine expenditures of the central government) was made to restore mangroves and tidal flats and other important wetlands, with areas restored exceeding 2,800 km^2.

China has been promoting creation of eco-provinces, cities and counties. By now 15 provinces have started such initiatives, among which 13 provinces have developed programmes for building eco-provinces. More than 1,000 counties (cities, districts) are implementing eco-county programmes. 38 counties (cities, districts) have been awarded national eco-counties (cities, districts), with 1,559 national eco-towns and 238 national eco-villages established. Since 2008, the central government has arranged a specialized fund of 19.5 billion yuan RMB for rural environment improvement. By following the policy of "using rewards instead of compensation to promote rural environment improvement", support was provided to 46,000 villages for such efforts and more than 87 million farmers benefited.

2.3.7 Environmental pollution control

(1) Enhancing pollution emission abatement. The Government of China has adopted "significant reduction in the total amount control of major pollutants" as one of binding targets for social and economic development, with a view to addressing outstanding environmental problems. During the period from 2000 to 2010, the annual average concentration of major pollutants has been going down overall. In particular since 2006, 10% reduction in the emissions of two major pollutants SO_2 and COD has been set as binding targets for social and economic development to enhance efforts in the total amount control of major pollutants. Since 2006 the emissions of COD from industrial waste water, SO_2 from effluent gases, soot, industrial dust and industrial solid wastes have been decreasing constantly. In the last decade, the intensity of pollutant emission per unit of GDP has significantly dropped by more than 55%. Since 2004, energy consumption per unit of GDP has decreased by 19.6%, and the intensity of CO_2 emission per unit of GDP by 15.2%. However overall the intensity of pollutant emission and energy consumption per unit of GDP in China is still high, and the amount of waste water discharging still increasing.

(2) Strictly implementing strategic environment assessments for plans or programmes and environmental impact assessments for projects. EIAs for projects have been strictly implemented. Measures such as "limited approvals for certain regions and certain sectors" have been implemented. Since 2008 governments have refused to approve 332 projects with total investment of 1.1 trillion yuan RMB, mostly those projects of high pollution, high energy consumption, resource consumption, low-level duplication and excessive production capacities. This has played an important role in industrial restructuring and optimizing economic growth.

Case 2.6 Innovative Management Model of Liaohe Protected Area

For some time, due to overexploitation, water pollution and biodiversity loss of Liaohe River have become serious problems and therefore the river was on the national list of rivers for priority control. In 2010 Liaoning Province Government set up a protected area in Liaohe River and established a management body for this PA. Liaoning Province People's Congress promulgated a regulation on this PA, which mandated its management body to coordinate the pollution prevention and control, natural resources conservation and ecological conservation in this protected area, undertaking supervision powers and law enforcement responsibilities that are usually exercised by departments of the environment, water resources conservation, land management, transportation, forestry, agriculture and fishery.

Liaohe PA covers the main part of the river basin and 14 counties (districts) in Liaoning Province, with a total area being 1,869.2 km^2 and total length being 538 km. Liaohe PA management body has undertaken the following measures, with engineering, management and conservation measures combined:

(1) Controlling pollution at sources. 134 municipal wastewater treatment plants have been established or renovated. 121 plants treating wastewater from towns and villages and 34 waste disposal plants have been established.

(2) Implementing ecological projects. Watercourses 167 km long have been treated comprehensively through measures like river dredging, bank protection with tree plantation and restoring aquatic plants. 16 water accumulation projects for ecological conservation have been implemented, and 53.3 km^2 of new wetlands added.

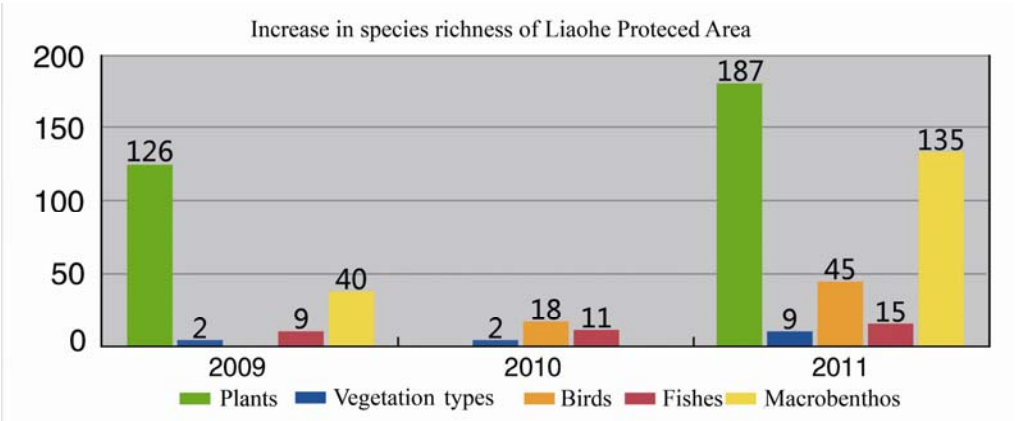
(3) Enclosing main flood control areas. Cultivated land in main flood control areas have been reclaimed to the river, with 386.7 km^2 of land reclaimed and 22.7 km^2 of river bank areas reforested.

(4) Implementing strict accountability system. Management is exercised by enforcing relevant laws. 123 sites of sand collection in the watercourses have been closed and more than 2000 m^3 of wastes have been cleaned and disposed of in non-hazardous ways.

After more than three years of efforts, obvious results have been achieved in the treatment and conservation of Liaohe River: (1) Water quality has been improving constantly year by year. By the end of 2009, one year ahead of planned time, Liaohe River has no sections with water quality lower than that of Grade V. During 80% of the time periods in 2012 the river had the water quality of Grade IV, and the water quality of some sections reached Grade III at some periods of time. (2) Ecosystems are improving as well. The vegetation coverage in Liaohe PA has increased from 13.7% to 63%, with biodiversity obviously increasing. The seal population at the estuary of Liaohe River is increasing, river saury began to swim back and the number of bluff fish and white bait reproduced obviously growing.

Kaiyuan Gujiazi Wetland before treatment (2010)

Kaiyuan Gujiazi Wetland after treatment (2011)



(3) Enhancing pollution prevention and control. China has promulgated and been implementing a Plan for Pollution Prevention and Control in Major River Basins 2011-2015 and Twelfth Five-year Plan for Air Pollution Prevention and Control in Key Regions. China has also revised its air quality standards. Active measures have been taken to implement National Plan for Prevention and Control of Underground Water Pollution, and a programme for underground water pollution prevention and control in north China plans has been developed. Pollution prevention and control in rivers and lakes has been further enhanced, with the percentage of seven major rivers with water quality better than that of Grade III increased from 41% in 2005 to 64% in 2012. The percentage of the rivers with water quality lower than Grade V decreased from 27% in 2005 to 12.3% in 2012. Great efforts have been made to dispose of chromium accumulated over years. A total of 6.7 million tons of chromium stored across the country for several decades or even half a century have been disposed of.

2.3.8 Prevention and control of invasive alien species

(1) Improving management system and mechanisms. A national programme has been developed for IAS emergency preparedness and response. 18 provinces (autonomous regions and province-level municipalities) have established IAS Management Office or a mechanism of joint conference (of relevant departments). 27 provinces (autonomous regions, province-level municipalities) have announced emergency responses for managing invasion of alien species. So far China has initiated 12 second-level and above emergency responses. In 2011, Hunan Province promulgated a provincial regulation on alien species. China has developed and issued 52 technical guidelines for monitoring, assessing, preventing and controlling invasive alien species as well as the first and second lists of invasive alien species for monitoring and tracking. China has also developed and issued 352 sectoral standards, 104 national standards and 2 international standards for plant quarantine.

(2) Strengthening capacity building for monitoring and early warning. A network of monitoring and early warning of forest pests and agricultural invasive alien species has been preliminarily established. Surveys have been undertaken of invasive alien species so as to know their distribution and damages they have caused. A system of IAS risk assessment has been established, with more than 1,500 alien species assessed. Mail inspection for tracking IAS has been undertaken across the country.

(3) Eliminating IAS. Elimination actions have been taken in more than 600 counties or cities of 22 provinces (autonomous regions, province-level municipalities), focusing on 20 key invasive alien species such as *Ambrosia artemisiifolia* and *Alternanthera philoxeroides*. Over 42.72 million persons-time have been mobilized for these actions and the total area with IAS eliminated or controlled has reached over 57,300 km^2-time. The elimination rate in key regions has

exceeded 75%, having effectively prevented the expansion of IAS. In February 2010 China issued a revised technical programme for preventing and controlling *Bursaphelenchus xylophilus*, with a view to further strengthen prevention and control of *Bursaphelenchus xylophilus*. As a result the area affected by *Bursaphelenchus xylophilus* has decreased from 846.7 km^2 of the peak period to 453.3 km^2 in 2011.

(4) Education and Training. Various media such as radio, television, journals and internet are used for education and training on techniques for preventing and controlling IAS. More than 200,000 copies of relevant publications such as "100 Questions on Agricultural Invasive Alien Species" have been published and disseminated. National training workshops have been organized on emergency responses to invasive alien species.

2.3.9 Biosafety management of GMOs

The Government of China attaches high importance to biosafety management of genetically modified organisms (GMOs) and has undertaken the following actions:

(1) Establishing strict and rule-based management system. The State Council has promulgated "Regulation on Management of Agricultural Genetically Modified Organisms", which provides rules for risk assessment, production licensing, business licensing, product labeling and import/export approvals. China has also issued other relevant regulations and rules to manage the whole processes from research, development to application of GMOs. The State Forestry Administration has issued rules for approval of genetic engineering of trees which regulates relevant activities in this regard. The State Council has established a mechanism of joint conference of relevant ministries and departments, which is responsible for studying and coordinating major policy and legal issues concerning biosafety management of agricultural GMOs.

(2) Establishing a sound and complete system of assessment. Safety assessments are undertaken by Biosafety Committee of Agricultural GMOs composed of experts from different fields. The members of this Committee are recommended by relevant ministries and commissions and appointed by the Ministry of Agriculture. Currently there are 64 members sitting on this Committee. The science-based, case-by-case, precedent-based, and step-by-step principles are followed to undertake assessments of agricultural GMOs at different levels and in different phases.

(3) Strengthening technical support capacity building. The Government of China pays high attention to technical capacity building for risk assessment and detection of GMOs. So far 39 institutions undertaking GMO risk assessment and

detection have been approved by the Ministry of Agriculture. 82 technical standards for GMO safety have been developed and regular detection of GMOs is being undertaken. Some results have been highly recognized by the international science community, and provide strong technical support for safety supervision of GMOs in China.

2.3.10 Incentive measures

(1) Eliminating subsidies unfavorable to biodiversity. To avoid negative impacts on biodiversity and the environment, China eliminated in 2007 export tax rebates of 553 products of high energy consumption, pollution and resources consumption, including endangered animals and plants and their products, leather products, some wood products and disposal wooden products.

(2) Establishing guarantee funds for ecological restoration and environmental improvement of mining sector. In 2006, the Ministry of Finance, together with the Ministry of Land Resources and the State Environmental Protection Administration developed guidance for establishing a responsibility system for ecological restoration and environmental improvement of the mining sector. The guidance requires the mining sector to provide guarantee funds out of their mining product sales incomes for ecological restoration and environmental improvement. So far 30 provinces (autonomous regions, province-level municipalities) have established such funds for ecological and environmental restoration in the mining areas. By the end of 2012, 80% of the mines have paid their guarantee funds, totaling 61.2 billion yuan RMB and accounting for 62% of the total funds that should be paid.

(3) Subsidizing households that return cultivated land to forests. Since 1999, the central government has been subsidizing those households that have returned their cultivated land to forests according to the actual areas returned and verified. These households also have the ownership of forests that grow on returned land, with contract period for owning and using returned land being as long as 70 years, while enjoying preferential tax incentives for benefits from use of returned land. In 2007, the State Council issued a notice on improving the policy of returning cultivated land to forests, with a view to increase the subsidies to related households. According to this notice, households living in the Yangtse River Basin and South China can be subsidized in cash by 1,575 yuan RMB per hectare of land annually, while households living in the Yellow River Basin and North China can get a cash subsidy of 1,050 yuan RMB per hectare of land. Farmers that return land to forests with ecological functions can be compensated for eight years, while those that return land to forests with economic functions can be compensated for five years. From 2008 to 2011, the central government provided specialized grants totaling 46.2 billion yuan RMB. By the end of 2012, the central government has invested cumulatively 324.7 billion yuan RMB, and 124 million farmers in 2,279 counties

directly benefited from this investment, with per household being subsidized 7,000 yuan RMB on the average.

(4) Subsidizing the projects on natural forest protection. Natural forest resources protection projects were initiated in 17 provinces in 2000. The central government subsidized forest management and conservation as well as seedling cultivation and reforestation. The central government also provided subsidies by covering pension insurances for forest enterprise employees and social expenditures of forest enterprises, and providing basic life guarantees for laid-off forest workers. The total investment for the first phase of this project went up to 118.6 billion yuan RMB. At the end of 2010, the State Council decided to implement a second phase of this project from 2011 to 2020, with 11 more counties (cities, districts) to be included in the project. The subsidy provided for reforestation will be 4,500 yuan per hectare, and those for enclosing mountains for forest conservation and aerial seeding will be 1,050 yuan RMB per hectare and 1,800 yuan RMB per hectare respectively. Education subsidy is 30,000 yuan RMB per person per year. Sanitation subsidy for forest areas in the upper reaches of the Yangtse River, the upper and middle reaches of the Yellow River and Inner Mongolia is 15,000 yuan RMB per year and 10,000 yuan RMB per year respectively. For state-owned forests, the central government provides 75 yuan per hectare annually as forest conservation fee. For those collectively-owned forests that also belong to national-level pubic benefits forests, during 2011-2012, the central government provided 150 yuan RMB per hectare annually as part of the funds for ecological compensation. Since 2013, this rate has been increased to 225 yuan RMB per year. For local benefits forests the compensation funds are provided mainly from local government budgets, while the central government also provides 45 yuan RMB per hectare per year as forest conservation fee. The total investment of the second phase of this project will be around 224 billion yuan RMB.

(5) Subsidizing projects of returning grazing land to grasslands. Since 2003 such projects have been implemented in eight provinces such as Inner Mongolia, Sichuan, Qinghai and Xinjiang. The central government has been subsidizing the construction of fences and the provision of forages. In 2011 the central government raised the subsidy standards and percentages. 300 yuan RMB per hectare is provided to fence building in Qinghai-Tibet Plateau while 240 yuan RMB per hectare to other regions. A subsidy of 300 yuan RMB per hectare is provided to reseeding grass; 2,400 yuan RMB per hectare to artificial forage farming and 3,000 yuan RMB per household for building feeding stables and rings. The central government invested cumulatively a total of 17.57 billion yuan RMB in this project during the period 2003-2012, with projects having benefited 174 counties, more than 900,000 farm households and more than 4.5 million farmers and herdsmen.

(6) Establishing subsidies and incentives for ecological conservation of grasslands. Since 2011 eight provinces or autonomous regions with most of the

grasslands in China have established incentive measures for grassland ecology conservation, with a subsidy of 90 yuan RMB per hectare annually for grasslands where grazing is banned; 22.5 yuan RMB per hectare annually for grasslands where balance of herds and grass supply is implemented. Subsidies are also provided to herdsmen for their production, with 150 yuan RMB per hectare annually for grass seed and 500 yuan RMB per household annually for production materials. Herdsmen are also trained to promote their shift to new jobs. The subsidies for grassland ecology conservation increased from 13.6 billion yuan RMB in 2011 to 15 billion yuan RMB in 2012, with cumulative total investment reaching 28.3 billion yuan RMB. By the end of 2012, the areas covered by subsidies for grassland grazing bans have reached 820,000 km^2, and the areas where rewards are given for keeping the herd-and-grass balance have reached 1,737,000 km^2.

(7) Subsidizing wetland conservation. In 2010 the Ministry of Finance together with the State Forestry Administration initiated subsidies for wetland conservation, which covered 27 wetlands of international importance, 43 natural wetland nature reserves and 86 national wetland parks. Some local governments also increased support to wetland conservation from government budgets, and gradually included important wetlands as part of ecological compensation.

(8) Establishing funds for compensating forest ecological benefits. In 2004 China established national funds for compensation of forest ecological benefits, which subsidize plantation, nurturing, conservation and management of national-level public benefits forests, with funding allocated from the central government budgets. Among them, a subsidy of 75 yuan per hectare is provided annually for state-owned national-level public benefits forests, and 225 yuan per hectare annually for national-level public benefits forests owned collectively and privately. Currently the areas that have received such subsidies have reached 924,000 km^2. In 2013 the central government provided a total of 14.9 billion yuan RMB for compensation for ecological benefits of forests. Local governments also compensated for local public benefits forests.

(9) Establishing national mechanisms of ecological compensation for national key ecological function zones. Since the central government budget established in 2008 an item of fiscal transfers for national key ecological function zones, the scope of transfers has been constantly expanding. In 2013 funds were transferred to 492 counties and 1,367 land zones prohibited for development, with the total of funds transferred reaching 42.3 billion yuan RMB. In 2013, scenic spots in Yunnan, Guizhou, Sichuan and Xinjiang were included in the pilot work on ecological compensation.

Case 2.7 Pilot Ecological Compensation in Xin'anjiang River Basin

Xin'an River originates from Huangshan City, Anhui Province, and flows into Qiandao Lake scenic spot in Zhejiang Province, and eventually into East China Sea, via Fuchun River and Qiantang River, with the river basin covering an area of 11,674 km^2. Xin'an River has the biggest water flow to Qiandao Lake while the lake is an important drinking water source for Zhejiang Province. To protect the water environment of Xin'an River, Huangshan City and other places in Anhui Province have sacrificed their own development for years by delaying their industrialization and urbanization processes.

In March and September 2011, the Ministry of Finance and the Ministry of Environmental Protection issued a notice on initiating pilot work in ecological compensation for the water environment of Xin'an River as well as a programme of implementation in this regard. Funds of 300 million yuan RMB were allocated in 2011 for compensation and specially used for water pollution control and water quality improvement in the upper reaches of Xin'an River. Among them 200 million yuan was allocated from the central government budget and 100 million yuan provided by Zhejiang Province. Anhui and Zhejiang Provinces were the first in China among those that have established a mechanism of compensation for the water environment in a trans-province river basin to protect water resources for Xin'an River and Qiandao Lake.

2.3.11 Scientific research

The Government of China encourages and supports scientific research in conservation and sustainable use of biodiversity. Projects related to conservation and sustainable use of biodiversity have been included in a number of science and research plans or programmes, such as National Plan for Support to Science and Technology, National Plan for Development of Key Fundamental Research, National High-tech Development Plan, National Natural Sciences Fund and Specialized Funds for Research in Public Benefit Sectors. For example, in the Eleventh

Five-year Plan for Support to Science and Technology, there were key projects such as “monitoring of important biological resources in China and demonstration and application of key conservation techniques”, “techniques for restoration of typical vulnerable ecosystems and demonstration” and “comprehensive monitoring and assessment of China’s important terrestrial ecosystems in support of decision making”. National Plan for Development of Key Fundamental Research also included projects such as “research on evolution and protection of biodiversity in the Himalaya Region”, and “theory and methods of pest control by agricultural biodiversity and protection of germplasm resources". In building information platforms for nature-related science and technology, support has been provided to survey and collection of animals, plants, micro-organisms and germplasms as well as associated information system development and sharing of relevant information and specimens. All these research projects have generated a number of valuable and influential research results, thus providing scientific and technical support to biodiversity conservation in China.

2.3.12 Public participation

To popularize biodiversity knowledge among primary and middle school students, curriculum requirements for biology for middle and high schools published in 2011 have incorporated biodiversity-related knowledge. Through classroom teaching in primary and middle schools, biodiversity knowledge of primary and middle school students has been upgraded overall. 1,908 universities in China have established majors or programmes on biology. Nearly 50 universities have undergraduate programs on ecology, 38 universities have master-degree programs on ecology and 22 universities have PhD degree programs on ecology. These degree programs have trained professionals for biodiversity conservation and research, with the total number of professionals having exceeded 556,000 by the end of 2012.

Various departments have organized various communication and education activities through media such as television, internet, newspapers, journals and radios as well as training workshops, lectures and dissemination of training materials. In particular while organizing China Biodiversity Communication Trip to celebrate the International Year of Biodiversity in 2010, 40 large-scale communication and education activities of various kinds were organized at national level, with more than 370,000 communication and educational materials of various kinds disseminated and audience influenced by various media reaching 804 million person-time. At local levels, 191 large-scale communication and educational activities were organized, with more than 350,000 materials disseminated and 25 movies with biodiversity themes produced. About 20,000 institutions including nature reserves, zoos, botanical gardens, parks, institutions undertaking environmental education and research as well as televisions, newspapers and internet were involved in a series of educational activities open for primary and middle school and university students, reaching out to 100 million person-time. Through communication and education, the public has shown

higher enthusiasm for participation and their awareness of biodiversity conservation has obviously increased, with importance of biodiversity more widely recognized.

2.3.13 International cooperation and exchanges

China has been undertaking various ways of cooperation such as bilateral and multilateral cooperation and South-South cooperation and has achieved satisfactory results and promoted the implementation of the Convention and its Protocols.

(1) Multilateral cooperation moving forward stably. China is a Party to the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat and the United Nations Framework Convention on Climate Change. China has been actively participating in the negotiations of these Conventions and seriously implementing relevant obligations as well as participating in the building of relevant multilateral systems. China has been contributing what it can to international developments of the CBD and its implementation processes including provision of funding. China has implemented a number of biodiversity projects in collaboration with the Global Environment Facility, the World Bank, UNDP and UNEP. Through these projects China has introduced useful concepts and technologies of and attracted funds for biodiversity conservation and management, which have promoted biodiversity conservation in China. Since the 32nd session of the GEF Council held in November 2007 approved China Biodiversity Partnerships Framework (CBPF), 9 projects have been implemented one after another.

(2) Breakthroughs made in bilateral cooperation. China has established broad channels of cooperation and exchanges with over 50 countries such as Germany, USA, Russia, UK, Norway, Canada and Australia. A system of various forms of cooperation has been established with cooperation mainly between governments. The six-year-long Europe-China Biodiversity Program (ECBP) was successfully completed in 2011, which played an important role in promoting biodiversity conservation and sustainable use in China. The project was considered an indication of breakthrough in bilateral cooperation.

(3) New progress made in South-South cooperation. In recent years the Government of China has been actively undertaking South-South cooperation in the field of biodiversity, by signing agreements of cooperation with many developing countries in areas related to biodiversity. China has organized a number of capacity development workshops for developing countries from the sub-regions such as South and Southeast Asia. China has also established a Center for China-ASEAN Environmental Cooperation, the first platform China has established for South-South environmental cooperation and regional environmental cooperation.

Case 2.8 EU-China Biodiversity Program Achieved Rich Results

First, the program contributed significantly to strategic planning. The program provided important support to updating China's NBSAP (2011-2030). The program had significant influence on mainstreaming biodiversity at local level. Four-fifths of the provinces (autonomous regions or province-level municipalities) that have been involved in this program have incorporated biodiversity into their own development plans for the 12th five-year plan period.

Second, the program strengthened coordination mechanisms for and promoted the processes of implementing the CBD. At national level the program strengthened China's Coordinating Group on Implementation of the CBD and promoted the synergies in the CBD implementation among relevant departments such as the National Development and Reform Commission, the Ministry of Land Resources, the Ministry of Agriculture, the Ministry of Water Resources, the State Administration on Quality Supervision, Inspection and Quarantine, the State Administration on Chinese Medicine and the State Forestry Administration. At local level the program promoted incorporation of biodiversity into relevant regional planning for social and economic development. For example, Hainan Province Master Plan for Land Use, which is consistent with requirements for biodiversity conservation, was approved by the State Council in 2010.

Third, the program supported high-level decision making. The program supported relevant strategic research under China Council for International Cooperation on the Environment and Development (CCICED) and provided policy recommendations related to ecosystem services and biodiversity, which have been presented to high-level policy makers. The program for the first time proposed that biodiversity should be included in the strategic environmental assessment for national key industry development. This plays a positive role in promoting transition in patterns of economic development and building an environmentally friendly and resource-efficient society.

Fourthly, the program strengthened capacities. The project provided technical and financial support to assist governments of different levels in developing policies, regulations, plans, standards and guidelines related to biodiversity. So far 46 of these have been approved by the State Council, relevant local governments, People's Congresses or government departments, while 27 are waiting for approval. All these have extensively improved capacities to implement the CBD at different levels.

Fifthly, the program supported communication and education and increasing the environmental awareness. The program helped establish public platforms for communication and education, which communicate and popularize concepts and knowledge of biodiversity for the governments, the private sector, local communities, schools and the media, by using internet, movies, publications, newsletters and various forms of participatory training activities. They have increased to great extent the public knowledge and awareness of biodiversity. They have in particular supported activities in China celebrating the International Year of Biodiversity, which have generated significant social impacts.

Finally, the program supported team building and personnel training for implementation. A big number of policy makers, managers, experts and media professionals from various levels, being from government departments to research institutions, have been deeply involved in the implementation and management of the program. As a result they have learned about new concepts, broadened their vision, strengthened their capacities and upgraded their levels, thus becoming influential core team members with stronger capacities for the implementation of the CBD.

Case 2.9 Incorporating Biodiversity into Land Use Planning and Land Reclamation

With the support of EU-China Biodiversity Program, the Ministry of Land Resources initiated in October 2008 a project on biodiversity conservation in land use planning and land reclamation, and Guizhou and Hainan Provinces were identified as pilot sites for the project. The project supported the development of programmes and guidelines for incorporating biodiversity into land use planning and land reclamation as well as proposed ecologically friendly engineering techniques for land reclamation that are suitable for China's circumstances. This was a useful attempt to integrate biodiversity into land use. In 2010, Hainan Province Department of Land Resources and the Environment issued technical guidelines for incorporating biodiversity into land use planning, which require that concepts of biodiversity conservation should be integrated in master planning for land use. Meanwhile Hainan Province approved two local master plans for land use that had incorporated biodiversity considerations, one for Lingshui County and another for Ledong County, both of which are resided by people of Li ethnicity. Guizhou Province Department of Land Resources also issued a notice on strengthening biodiversity and ecological conservation while comprehensively treating land. In September 2010 Guizhou Province approved two local land reclamation plans that incorporated biodiversity consideration, one for Guanling County and another for Libo County. The issuance of these plans and documents has improved the structure and layout of land use, thus promoting biodiversity conservation.

Case 2.10 Biodiversity Conservation and Sustainable Management of Grasslands in Hulunbei'er

Hulunbei'er Grassland, located in Inner Mongolia, is facing threats of large-scale land degradation and desertification, due to overgrazing, deforestation and irrational mining as well as arid climate. With the support of EU-China Biodiversity Program and relevant international organizations and research institutions, Hulunbei'er City implemented a project on biodiversity conservation and sustainable management of grasslands and achieved obvious results.

(a) Established a committee on biodiversity conservation headed by vice mayor. Meanwhile counties and districts under the city's administration have also set up their biodiversity committees, thus forming an operational mechanism for biodiversity at the city level and incorporating biodiversity into relevant government work.

(b) Issued the first local regulation on biodiversity, which clearly requires that biodiversity will be incorporated into the city's 12^{th} five-year plan for social and economic development, providing a policy basis for grassland biodiversity conservation.

(c) Developed the city's biodiversity strategy and action plan. The city has gradually undertaken grassland biodiversity conservation activities according to BSAP.

(d) Signed a MOU of cooperation with Mongolia and established a transboundary cooperation platform with a province of Mongolia. Many transboundary conservation actions have been taken which play a very important role in protecting the habitat, reproduction and migration of Gazelles endemic to the Mongolian Plateau.

(e) Developed a brochure of guidance for grazing in Hulunbei'er Grassland and demonstrated models for best practices for grazing in degraded grasslands, which are of great significance for grassland biodiversity conservation.

(f) Established demonstration sites of restoration of degraded grasslands and summarized 8 models from relevant work. All these results and models have been applied for the desertification control of an area of 667.7 km^2 of the city in 2009, providing technical support for desertification control at larger scale.

(g) Developed a technical handbook for monitoring of grassland biodiversity and increased biodiversity monitoring capacities of the ecological monitoring stations of the city and Dalai Lake and Huihe River national-level nature reserves.

(h) Disseminated biodiversity knowledge to the public through TV, radio, newspapers, government bulletins and large-scale activities and increased the public awareness of biodiversity.

2.4 Overall Assessment of Progress in Implementing NBSAP

Since the updated NBSAP (2011-2030) was launched in 2010, China had a good beginning of implementation of this new strategy and action plan and is moving towards the right direction. One action has achieved major progress, i.e. Action 10: "promoting and coordinating the establishment of information system on genetic resources". 15 actions have achieved considerable progress and 14 actions have achieved some progress (details in annex 1). Main progress is achieved in the following three areas.

1. China has basically established a system of biodiversity conservation and management with its own characteristics

(a) The legal and regulatory system for biodiversity conservation and sustainable use is being increasingly improved.

(b) Coordination mechanisms for biodiversity conservation are almost in place and management capacities of governments have been further upgraded.

(c) A network of nature reserves has been established, with various categories, relatively reasonable layouts and relatively sound functions. A large number of scenic spots, forest parks, community-based conservation areas, protected sites of wild plants, wetland parks, geological parks, special marine protected areas, and germplasm conservation areas have been also established. Nature reserves have protected 90% of China's terrestrial ecosystem types, 85 of wild animal populations and 65% of higher plant biota as well as covered 25% of primitive natural forests, over 50% of natural wetlands and 30% of typical desert areas.

(d) The public enthusiasm for and capacities of participation in conservation have been considerably enhanced.

(e) The innovation capacities of colleges, universities and research institutes have been considerably upgraded.

(f) New progress made in international cooperation and exchanges.

2. The ecological degradation trend is slowing down and ecosystems in some regions are being restored.

(a) The forest resources have been constantly increasing, with forest areas increased by 23% over that of a decade ago and forest reserves by 21.8% over that of a decade ago.

(b) The areas where soil erosion has been prevented and controlled have reached 270,000 km^2, covering 12,000 small river basins. The areas where enclosure for conservation was implemented have reached 720,000 km^2, and among them, ecological recovery is occurring in areas of 450,000 km^2.

(c) The number and populations of some national key protected wild animals and plants are stable, and some even going up, with their scope of distribution expanding and quality of habitats constantly improving. The number of Giant Pandas increased from over 1000 in the 1980's to 1,590 currently. The number of Crested Ibises grew from 7 in the 1980's to over 1,800 now. The populations of protected

plants such as yews, orchids and cycads are constantly increasing.

(d) The annual emissions of main pollutants are going down overall. Since 2000, the density of pollutant discharging per unit of GDP has fallen by more than 55%. Since 2004, energy consumption per unit of GDP has decreased by 19.6% and the density of CO_2 emission per unit of GDP down by 15.2%.

3. Comprehensive social and economic development at local level while biodiversity is conserved.

Well-beings of local communities are improved while ecosystems are conserved and restored. The net income of rural households in 2011 increased by 40.8% over that in 2000, with the number of people living in poverty significantly going down.

Part III. Sectoral and Cross-sectoral Integration of Biodiversity

Conservation and use of biodiversity involves many departments and sectors. This part covers biodiversity integration into relevant sector planning and main actions and measures taken by relevant member departments of China's National Committee on Biodiversity Conservation.

3.1 Development and Reform Commission

Development and Reform Commission (DRC) has taken into full consideration important roles of ecological conservation in social and economic sustainable development. Following the principles specified in China's updated NBSAP (2011-2030), DRC has developed relevant policies and regulations for returning arable land to forests, returning grazing land to grassland, control of desertification in rocky areas, control of sources of sandstorms and protecting key ecological zones.

(1) Building strategic layout for land use and development based on national ecological security. As the first national land spatial plan, National Plan of Major Function Zones divides the whole country into three major areas, i.e. urban areas, agricultural production areas and ecological function areas, and identifies four types of regions according to their functions: regions for priority development, regions for key development, regions for limited development and regions prohibited for development. The Plan outlines a strategic layout of ecological security (Table 3.1) composed primarily of ecological barriers in Qinghai-Tibet Plateau, the Loess Plateau and Sichuan-Yunnan Provinces, forest belts in northeast China, sand control belts in north China and hilly areas of south China. The Plan also contains a list of national major ecological function zones and a list of banned development zones, as well as relevant assessment and zoning maps.

Table 3.1 China's Strategic Ecological Security Layout ("Two Barriers and Three Belts")

Regions	Key Priorities for Ecological Conservation
Qinghai-Tibet Plateau	To protect various, unique ecosystems to allow them to play roles in regulating water for big rivers and climate
Loess Plateau/Yunnan-Sichuan	To strengthen control of soil erosion and protection of natural habitats to ensure ecological security in the Yangtse River Basin and the middle and lower reaches of the Yellow River
Northeast China Forest Belt	To protect forest resources and biodiversity to allow northeast China plains to play the role of ecological security barriers.
North China sand control belt	To strengthen construction of forest belts, grassland conservation, sand fixing and prevention of sandstorms; and to enclose for protecting those areas where desertified land cannot be controlled for the time being; and to allow forest belts to play the role of ecological security barriers.
Hilly areas of south China	To strengthen habitat restoration and control soil erosion, so that south China and southwest China can play the role of ecological security barriers.

(2) Promoting establishment of mechanisms for ecological compensation. In 2010 NDRC together with relevant ministries and commissions drafted a regulation on ecological compensation. This draft regulation provides principles, areas, targets, approaches and criteria for ecological compensation. Currently NDRC is studying and drafting a set of “recommendations for establishing and improving mechanisms for ecological compensation”.

(3) Integrating ecological conservation into local planning for economic development and transition. To help local governments create a favorable policy environment for economic transition and ecological conservation, NDRC and State Forestry Administration (SFA) and other relevant ministries jointly issued in 2010 “Plan for Economic Transition and Ecological Conservation in Major and Minor Xing’anling Forest Areas (2010-2020)". Currently NDRC is also developing other important plans such as “Plan for Development of Border Areas in Heilongjiang Province and Eastern Inner Mongolia” and “Plan for Economic Transition and Ecological Conservation in Changbai Mountain Forest Areas”.

(4) Enhancing ecological conservation in key regions. NDRC together with other relevant ministries and departments has developed the Twelfth Five-year Plan for West China Development. This plan has identified strategies and action plans for implementing major ecological projects in West China during 2011-2015. NDRC has also developed and issued other important plans such as “Plan for Building Tibet’s Ecological Security Barrier 2008-2013” and “Plan for Second-Phase (2013-2020) Implementation of the Project on Control of Sources of Sandstorms Affecting Beijing and Tianjin”. NDRC arranged funds from the central government budget to support key ecological projects such as natural forest protection, control of desertification in rocky areas and construction of forest belts in north, northwest and northeast China.

(5) Integrating biodiversity conservation into responses to climate change. NDRC has developed consecutively a number of plans or programmes in this regard, such as Comprehensive Programme of Work for Energy Conservation and Pollution Abatement for 2011-2015, Plan for Energy Conservation and Pollution Abatement for 2011-2015 and Programme for GHG Emission Control for 2011-2015. All these plans or programmes are intended to fully synergize efforts in climate change adaptation and ecological and biodiversity conservation, through implementing measures such as adjusting industrial structures, improving energy efficiency, developing low-carbon energy resources, optimizing energy structures, increasing carbon sinks and strengthening ecological conservation.

3.2 Education

The education sector attaches high importance to education, teaching and training in the field of biodiversity, through strengthening basic education, science popularization activities, professional education and training.

(1) Disseminating biodiversity knowledge in basic education and science popularization activities. To allow primary and secondary school students to understand the importance of biodiversity, biodiversity-related knowledge has been incorporated into middle and secondary school curriculums and textbooks such as those published in 2011 on biology for middle and secondary schools. One chapter on biodiversity was included in the school textbook on biology for middle schools published in 2011, where content and requirements related to biodiversity are clearly specified. The secondary school curriculum criteria require students to summarize the evolutionary theory and the formation of biodiversity as well as the importance of biodiversity and measures that could be taken to protect it. Students are encouraged to get involved in biodiversity conservation activities after school. Various places and schools organized various activities to widely disseminate knowledge of biodiversity sciences and related laws and regulations, such as creation of green communities, green schools and green families, and organizing knowledge contests, lectures, eco summer camps, writing contests and various celebration activities.

(2) Providing undergraduate programs and professional training on biodiversity. In accordance with the list of programmes and majors for universities published in 2012, majors or programmes related to biodiversity include biological sciences, marine sciences, nature conservation and environmental ecology, forestry sciences and grass sciences. Currently, nearly 2,000 universities or colleges (about 80% of the total number of universities in China) in China have programmes or majors related to biodiversity. Among them there are about 800 universities and about 1,200 colleges. A total of 298 universities have majors or programmes on biology; 52 universities have majors in ecology and most of comprehensive universities and teachers' colleges have courses on life sciences and ecology. The number of university graduates from biodiversity-related programmes or majors has increased over years. The number in 2008 was about 106,000, and rose to 117,000 in 2012, an increase by 110% over that of 2008. By the end of 2012, the total number of professionals that have received university education in biodiversity-related sciences has reached 557,000. Meanwhile Chinese universities invest significantly in specimen museums, and by now there are about 180 specimen museums of various kinds in Chinese universities, providing platforms for research and education in the field of biodiversity.

(3) Strengthening disciplines related to biodiversity. In China’s current Catalogue of Degree Programs and Disciplines for Professional Training, there are many Class A subjects related to biodiversity. For 5 Class A subjects, i.e. biology, ecology, biological engineering, forestry and grass sciences, at present Chinese universities have 172 PhD programs and 225 master programs. From 2008 to 2012, Chinese universities with these degree programs (on these five subjects) have granted PhD degrees to 17,110 candidates and master degrees to 63,634 candidates. China has encouraged those universities with such degree programs to set up Class B subjects related to biodiversity as required by needs for their program development and broader

needs for social and economic developments, with a view to strengthen research, development and professional training in the field of biodiversity.

(4) Nurturing and attracting more talents. In recent years China has been implementing a series of plans to attract talents and chief scientists to better support and advance biodiversity research. In particular since One Thousand Talent Plan was implemented in 2008, Chinese universities have attracted 118 biodiversity experts and 78 ‘Yangtse River’ scholars. The Ministry of Education established platforms and created conditions for talents to upgrade their innovation capacities and competitiveness through a plan for senior, innovative talents. In 2013, the Ministry of Education supported 18 innovation teams and more than 100 new-century talents in the fields related to biodiversity.

3.3 Science and Technology

National Programme for Mid- and Long-term Development of Science and Technology (2006-2020) has included in its key areas for the environment themes such as ‘restoration of ecosystem functions in ecologically vulnerable regions’ and ‘monitoring of global environmental change and responses’. In its key areas for agriculture one theme is ‘ecological security of agriculture and forestry and modern forestry’. In its fundamental research programmes, there is one research programme on mechanics of human activities impacting the Earth’s systems. All these themes and research programmes have provided directions for biodiversity research.

The Ministry of Science and Technology (MOST) has included projects on conservation and sustainable use of biodiversity in the National Plan for Support to Science and Technology, National Programme for Key Fundamental Research and Development, National Plan for High-tech Development and other plans using specialized funds. In the Eleventh and Twelfth Five-year Plans for Support to Science and Technology, there are 32 key projects on ecological and biodiversity conservation, such as ‘building ecological security barriers in southwest China and demonstration (Phase I)’, ‘research on and demonstration of techniques for biodiversity conservation and breeding of endangered species’, and ‘research on and demonstration of techniques for monitoring and conservation of important species’. A total of 1.37 billion yuan RMB was invested into these projects. National Programme for Key Fundamental Research and Development also included projects such as ‘research on evolution and protection of biodiversity in Himalaya Region’, and ‘theory and methods of pest control and protection of germplasm resources in support of agricultural biodiversity’. Some projects in the National High-tech Development Plan (863 Plan) have also included technology development for biodiversity conservation and sustainable use of biological resources. The international cooperation plan of the Ministry of Science and Technology has included a few key projects such as ‘key techniques for ecosystem management in Dongting Lake Basin and their

demonstration applications'. In building platforms of information resources for nature-related science and technology, support has been provided to survey and collection of animals, plants, micro-organisms and germplasms as well as associated information system development and sharing of relevant information and specimens. All these research projects have generated a number of valuable and influential research results, thus providing scientific and technical support to biodiversity conservation in China.

From August to December 2010 and from September to November 2013, the Ministry of Science and Technology organized a series of site visits for scientists and experts in the field of ecological conservation. Senior experts were invited to visit more than 20 typical areas of ecological degradation, such as rocky area in Bijie, Guizhou Province, and degraded grassland in areas of origin of three major rivers in Qinghai Province and deserts in southern Xinjiang. Discussions were held following the site visits. From the discussions a number of technical approaches for ecosystem conservation were summarized and recommended for promotion and application.

Since the eleventh five-year plan period, the Ministry of Science and Technology supported, through specialized funds for fundamental research, scientific surveys in the field of biodiversity and climate change undertaken by those research institutions affiliated with the Ministry of Education, the Ministry of Agriculture and the Chinese Academy of Sciences (CAS). By the end of 2013, the Ministry of Science and Technology has supported nearly 70 projects and invested nearly 600 million yuan RMB into such surveys. The regions surveyed include Pan-Himalaya region, Qinghai-Tibet Plateau, Hainan Island and Xisha Islands, Luoxiao Mountain Range, hilly areas of south China, ecologically sensitive hilly areas and plains in coastal areas of southeast China, tropical islands and coastal areas, arid areas in north and northwest China, and temperate conifer forest areas in northeast China. The surveys covered lakes, islands, seas and oceans, forests, species and germplasm in special habitats as well as invasive alien species. As a result of these surveys, Fauna of China, Flora of China, China's vegetation map including vegetation composition and distribution, and a list of marine species were compiled and developed. In addition, China Forest Biodiversity Monitoring Network and China Ecosystem Research Network have been further improved, and standards and specifications have been developed for monitoring plants, animals and micro-organisms.

By using rich digitalized information available, CAS and other institutions have established National Specimens Information-sharing Platform (NSII), Asian Biodiversity Conservation and Development Network (ABCDNet) and China node for the Global Biodiversity Information Facility (GBIF). CAS has completed assessments of the status of endangerment of more than 30,000 higher plant species in China and based on that, issued China Plant Red List as well as identified hot spots for plant conservation based on the distribution of protected and endemic plants in China. CAS has also initiated certification of carbon budget and relevant projects in response to

climate change.

3.4 Land and Resources

Land and resources sector gives strategic importance to biodiversity while developing and implementing its national land planning, land use planning and land remediation planning.

(1) Integration of biodiversity into national land planning. The Ministry of Land and Resources (MLR) has comprehensively undertaken national land planning, with a view to coordinate between land development, use, conservation and remediation and to improve spatial layouts of land development. The National Land Planning Strategy requires that forests, grasslands, lakes, wetlands and coastal and marine ecosystems should be strictly protected, and the protection of functions of various national-level nature reserves and important ecological function zones should be strengthened. The strategy also calls for establishment of a system of *in-situ* conservation for important biological resources primarily composed of nature reserves and complemented by various forest parks, germplasm conservation areas, hunting ban areas, deforestation ban areas and protected sites for original habitats for some species.

(2) Integration of biodiversity into land use planning at various levels. The National Master Plan for Land Use (2006-2020) issued by the State Council stressed the guiding principle of coordinating land use for production, livelihood and ecology conservation by giving priority to nature and ecology conservation. Chapter V of this plan clearly requires that land essential for ecology should be protected and greater efforts will be put into ecological and environmental improvements with land ecology improved based on local conditions. In 2010, MLR issued rules for developing master plans for land use at municipal, county and town levels. The rules require that local governments will control land use for urban and rural development and identify as banned development zones core areas of nature reserves, forest parks, geological parks, natural habitats for wild animals and plants included in the provincial and above protected lists, and core areas of protected water source areas. Those construction or development activities inappropriate to major functions of these areas will be strictly prohibited. In Hainan Province's Master Plan for Land Use, which was approved by the State Council, biodiversity has been incorporated into the land use master plan. Meanwhile, Hainan Province Government approved biodiversity-based land use master plans for Lingshui County and Ledong County, both of which are autonomous counties for Li ethnic people.

(3) Strengthening biodiversity conservation while planning land remediation. The Regulation on Land Reclamation issued by the State Council in 2011 provides that those having the obligation to reclaim land should follow standards for land reclamation and relevant environmental standards to protect soil quality and ecology and avoid soil and underground water contamination. The National Plan for Land

Remediation (2011-2015) issued by the State Council has identified ecological and biodiversity conservation as one of important targets. Specifically the target is to promote self-recovery capacities of degraded land ecosystems primarily through natural recovery as well as conservation and comprehensive environmental and ecological improvements. To improve the ecology of mining areas, MLR launched an action called 'Re-greening Mines' nationwide since June 2012, which was intended to address geological environmental problems caused by mining activities in important nature reserves and scenic spots, through engineering and biological measures. The action will help restore damaged ecosystems. Guizhou Province incorporated biodiversity conservation concepts into land remediation. In September 2010 Guizhou approved biodiversity-based land remediation and reclamation plans for Guanling Autonomous County and Libo County.

(4) Establishing mechanisms of multilateral cooperation. MLR, together with the Ministry of Commerce, the German Ministry of the Environment, EU and UNDP, implemented a few projects such as 'biodiversity conservation in land use planning and land remediation', and 'China-Germany project on low-carbon land use'. MLR also undertook technical exchanges with Belgium, Germany and EU for biodiversity conservation in land use planning, land remediation and reclamation. These collaborative activities have helped the Chinese personnel involved improve their biodiversity knowledge and broaden platforms for China and other countries to collaborate on research on land use and biodiversity conservation.

(5) Strengthening communication on biodiversity. During the World Expo 2010 in Shanghai, MLR organized thematic lectures and a series of communication and educational activities on biodiversity conservation in land use planning and land remediation to improve public awareness of biodiversity conservation in land management. In celebrating the Earth Day (22 April) and National Land Day (25 June) and other dates, MLR popularized biodiversity concepts and knowledge among land managers and researchers, university students and farmers, providing technical support for biodiversity conservation in land remediation.

3.5 Housing, Urban and Rural Development

(1) Improving relevant regulations and policies, sectoral standards and development plans. The Ministry of Housing, Urban and Rural Development (MHURD) has incorporated into its Twelfth Five-year Plan 'strengthening biodiversity conservation and adaptation to climate change in planned urban zones and scenic spots'. In 2010, MHURD issued recommendations concerning further strengthening management of zoos, and in 2013, MHURD developed a national programme for development of zoos, identifying targets and measures for species and population expansion. MHURD has also planned to implement sector-wide management of those species or populations identified as national levels I & II protected species, endangered

wild flora and fauna and listed in annexes I and II of the CITES. MHURD developed guidelines for designing urban botanical gardens and zoos in cities and technical guidelines for zoo management, all of which are intended to put urban biodiversity conservation into legal and standardized tracks.

(2) Incorporating biodiversity conservation into evaluation of national garden cities and eco-cities. Biodiversity has been incorporated as an important element in the national standards for garden cities issued by MHURD in 2010 and the methods and standards for classifying and evaluating eco-cities issued in 2012. Indicators such as comprehensive species index, local woody plant index, rate of naturalization of water body coasts and urban ecological conservation have been included for evaluation. Through creation of garden or eco-cities, most cities in China have completed consensuses on species, developed plans for protecting biodiversity in cities and implementation measures as well as effectively protected landscapes, hydrology, vegetation and species, which lead to increasingly rich biodiversity in cities.

(3) Using botanical gardens, zoos and wetland parks as bases for species conservation and research. In accordance with incomplete statistics, within the HURD system there are 200 botanical gardens that conserve *ex-situ* 20,000 plant species. In 2012, SFA, MHURD and CAS jointly issued recommendations on strengthening *ex-situ* conservation of plant germplasm in botanical gardens. More than 240 zoos including animal demonstration zones have been established, with 26 pedigree depositaries and 37 species lineages established. Considerable achievements made in *ex-situ* conservation of rare, endangered species, in particular Giant Pandas and south China tigers. The number of giant pandas raised in captivity has reached 332 by the end of 2011, with the main work having shifted from rapid growth in the number of individuals to upgrading the quality of the whole population. The number of south China tigers raised in captivity has increased from 6 to more than 100 currently, bringing back hope of recovery of its wild population. In response to human impacts on urban ecosystems, MHURD issued provisional rules for management of urban wetland parks and guidelines for designing urban wetland parks. So far 49 urban wetland parks have been established across the country, with the capacities increased and enhanced for conserving and managing wetlands in cities and conservation of wetland species in cities.

(4) Strengthening the system of monitoring and management of species in scenic spots. Scenic spots are important areas for biodiversity conservation. Since 2002, MHURD has established a system of information for monitoring and managing national-level scenic spots, using remote-sensing and GIS technologies to monitor natural resources conservation and implementation of relevant plans in scenic spots. Systems of dynamic monitoring and verification using remote-sensing technologies and inspectors for urban and rural planning have been established. So far monitoring has been undertaken in 208 national scenic spots. In 2012 and 2013 MHURD

organized inspections of law enforcement of conservation and management of national-level scenic spots. In 2013 pilot work on ecological compensation was undertaken in some scenic spots in Yunnan, Guizhou, Sichuan and Xinjiang. All these measures have played an important role in protecting species and the ecological environment and maintaining biodiversity within scenic spots.

(5) Establishing collaboration with international institutions and organizations. In recent years MHURD has established close collaboration with a number of international organizations and institutions such as UNESCO, IUCN and the US Department of the Interior. In recent years, due to the fact that more and more habitats for rare species and typical ecosystems are included in the world's heritage sites, MHURD has strengthened conservation and research of ecosystems and biodiversity in scenic spots and the world's heritage sites. In 2012, MHURD together with IUCN undertook pilot work on China Green List, and worked with UNESCO in monitoring and conserving biodiversity in the world's natural heritage sites such as Sichuan giant panda habitat, Libo Zhangjiang and Wuyi Mountain. MHURD is helping implement an action plan for biodiversity in one of the world's heritage sites in Dujiangyan-Qingchengshan, Sichuan Province. Since China joined the World Convention on Natural and Cultural Heritages, by the end of 2013, 21 sites in China have been successfully named as the world's heritage sites, attracting the attention worldwide.

3.6 Water Resources Management

In recent years the water resources management sector has actively undertaken biodiversity conservation as required by the updated NBSAP (2011-2030) and in accordance with the sectoral situation.

(1) Improved water-related laws, policies and programmes in support of biodiversity. Water resources allocation and protection, ensuring water use for ecology and soil conservation related to biodiversity conservation have been legalized and regulated, through improving regulations/rules associated with the Water Law and revising the Water and Soil Conservation Law, as well as the State Council decision on accelerating reforms in water resources management and recommendations for implementing the strictest rules for water resources management. Requirements for biodiversity conservation have been upgraded to legal and policy requirements, which clearly identify responsibilities and duties of water resources management, project implementers and the public in biodiversity conservation. The water resources sector has taken biodiversity into account while developing sectoral development strategies, plans or programmes. For example, National Plan for Water Resources for 2010-2030, National Programme for Protection of Water Resources, National Programme for Protection and Use of Underground Water, National Flood Control Plan for 2011-2015 and revised integrated plans for seven river basins have covered mainly water use quantity and quality for ecology, soil erosion prevention and control, soil conservation

and ecological compensation. In 2011, the State Council approved National Water Zoning Plan of Important Rivers and Lakes. This plan identified functions and water quality targets of 4,493 important water function zones. This plan provides an important basis for use and protection of water resources, preventing and controlling water pollution and improving the water environment.

(2) Ecological worsening trend in many important protected areas contained through ensuring water use for ecology. In recent years the water resources management sector has optimized the use of water resources in the Yellow River, Talimu River, Shiyang River and Hei River. As a result, no water flow shortage has happened in the Yellow River for 14 consecutive years; water resumed in Taitema Lake in the lower reaches of Talimu River, which had been dry for more than 20 years; Dongjuyanhai in the lower reaches of Hei River did not run dry for 9 years; and the water quantity flowing downstream from the section of Minqincai County of Shiyang River increased gradually. For nine years water from the Yangtse River was transferred to Tai Lake so as to improve the lake water quality by increasing water flow and volume to reduce pollution and avoid drought. Water is also supplied to lakes and wetlands such as Zhalong Wetland, Nansi Lake, Baiyangdian and Hengshui Lake to improve local ecological conditions and maintain water security for the ecologically vulnerable areas. Optimized water management was attempted in the Three Gorges Reservoir and other reservoirs in the river basin to meet ecological needs.

(3) Local ecology significantly improved by increased efforts in soil erosion control. Soil erosion control accelerated in recent years. Big soil erosion control projects have been implemented in key regions such as the upper and middle reaches of the Yangtse River and the Yellow River, the upper reach of the Pearl River, the reservoir area and upper reaches of Danjiang River, water source areas for Beijing, origins of sandstorms affecting Beijing and Tianjin, rocky areas of Shanxi, Shaanxi and Inner Mongolia, rocky Karst areas and black soil areas in northeast China. From 2009 to 2012, areas with soil erosion controlled have reached 270,000 km^2, covering 12,000 small river basins. Enclosures for soil erosion control continue to be implemented, with areas with enclosures implemented having reached 720,000 km^2, among which ecological conditions have started to improve in areas of 450,000 km^2, in particular sources of three major rivers in Qinghai, inland river basin of Xinjiang and Tibet. Impacts from enclosures for soil erosion control are increasingly obvious with ecological functions of enclosed areas effectively protected.

(4) Aquatic environmental and ecological quality in some regions significantly improved as a result of aquatic ecosystem conservation and restoration. 14 cities such as Wuxi, Wuhan, Guilin and Harbin have started aquatic ecosystem conservation and restoration through taking measures such as connecting water bodies, diverting polluted water, dredging rivers and lakes, treatment and restoration of coastal lines and protection of water sources. These measures have achieved good results and improved the aquatic environment and ecology. Wuhan has

improved water quality of 16 lakes in downtown areas through connecting rivers and lakes. Guilin has ensured water supply for Li River in dry season through optimizing water supply for effective biodiversity conservation. The rate of water functions in Wuxi having met relevant standards increased from 11.8% in 2005 to 46.8% now. Lishui City reduced areas affected by soil erosion by 567 km^2 through control measures in small river basins like Oujiang River, and the water quality of main branches that has met relevant standards has increased up to 98.7%. Laizhou City reduced areas eroded by marine waters from 261 km^2 to 228.5 km^2, through cracking down overexploitation of underground water.

3.7 Agriculture

Agricultural biodiversity is an important component of biodiversity. The Government of China always attaches great importance to conservation and sustainable use of agricultural biodiversity and has been developing and implementing relevant regulations, plans and programmes.

(1) Strengthening leadership and organization. The Ministry of Agriculture (MOA) has strengthened the following bodies or institutions as well as their capacities for conservation and management of agricultural biodiversity: Leading Group on Protection of Agricultural Wild Plants, Expert Review Committee on Wild Plant Protection, National Committee on Livestock Genetic Resources, MOA Office for Aquatic Wild Flora and Fauna Conservation, Scientific Committee on Endangered Aquatic Wild Flora and Fauna, Fishery Resources Management Committees of the Yangtse River Basin, the Yellow River Basin and the Pearl River Basin, National Coordinating Group on Prevention and Control of Invasive Alien Species (IAS), Office of Management of IAS, and MOA Research Center for IAS Prevention and Control. MOA has also established National Committee on Agricultural Crops Germplasm to coordinate the management of agricultural crops germplasm including agricultural wild plants, to propose development strategies and policies in this regard and to guide the development of mid and long-term plans in this regard.

(2) Improving regulations and standards. On the basis of existing laws and regulations, the Ministry of Agriculture has issued a series of regulations to improve the legal system for protection of livestock genetic resources, such as Rules for Approval of Import and Export of Livestock Genetic Resources and Collaborative Research with Foreign Entities, Rules for Management of Livestock Genetic Resources Conservation Farms and Gene Banks, Rules for Determination of New Livestock Varieties and Identification of Livestock Genetic Resources, Rules for Licensing of Livestock Genetic Material Production and Provisional Technical Requirements for Importing Livestock Genetic Resources. In 2010, NDRC and MOF issued a notice on collecting fees for grassland vegetation recovery, requiring that those using grasslands for mineral prospecting, mining and project construction should pay fees for grassland vegetation recovery. In 2012, China's Supreme Court issued an

interpretation of several legal issues concerning the trial of criminal cases against grassland resources, which set criteria for conviction and sentencing of such crimes. The Ministry of Agriculture developed four sectoral standards for protection of wild plants such as technical specifications for monitoring and early warning of protected sites of wild flora and technical guidelines for *ex-situ* storage of wild flora. MOA also issued Provisional Rules for Management of Protected Areas of Aquatic Germplasm Resources, Rules on Management of Restocking of Aquatic Species, Regulations on Impact Assessment of Construction Projects on National-Level Protected Areas for Aquatic Species, and a Notice on Management of Marine Summer Fishing Moratorium. MOA launched a programme for emergency response to invasion of alien species and major pests, the first list of IAS under national management as well as 17 sectoral standards for preventing and controlling IAS, such as technical specifications for controlling mile-a-minute weed and apple snails, as well as over 40 technical guidelines for emergency responses to IAS. All these have further improved the legal system for conservation of agricultural biodiversity.

(3) Integrating biodiversity into relevant plans and programmes. National Programme for Modern Agriculture Development (2011-2015) issued by the State Council set a number of goals for strengthening conservation of agricultural resources and ecology, grassland, aquatic resources, aquatic ecological restoration, livestock genetic resources and agricultural wild plant resources. For grassland biodiversity, MOA issued National Master Plan for Grassland Conservation and Use and National Twelfth Five-year Plan for Husbandry Development as well as a joint notice (together with MOF) on implementing rewards or subsidies for grassland ecological conservation and rules for assessing effectiveness of such mechanism. A number of grassland conservation projects were initiated such as returning grazing land to grassland, grassland conservation to control sandstorms affecting Beijing and Tianjin, permanent settlement for nomadic herdsmen and grassland fire prevention. The Twelfth Five-year Plan for Husbandry Development proposed to continue implementing livestock breeding projects, support infrastructure construction for conservation farms, protected areas and gene banks for livestock genetic resources, and to improve the national system of conservation of livestock genetic resources. The National Twelfth Five-year Plan for Fishery Development issued by MOA contains goals and measures for developing environmentally friendly fishery, improving aquatic environment, strengthening fishery moratoriums, restocking of rare species, strengthening protected areas of aquatic species and protecting aquatic biodiversity. The National Twelfth Five-year Plan for Agricultural Science and Technology Development required further strengthening collection, protection and identification of agricultural germplasm resources and agricultural genetic resources as well as development and improvement of breeding materials. The National Twelfth Five-year Plan for Plantation Industry also proposed to improve the national system for storing and using germplasm resources. The issuance and implementation of all these plans and programmes have strongly promoted the conservation and sustainable use of agricultural biodiversity.

(4) Strengthening protection of agricultural wild plant resources. One measure is to undertake surveys and monitoring of wild plant resources. China has obtained information concerning the distribution of 172 wild plant species across the country, and based on that, established a national information system of wild plant resources. Another measure is to promote establishment and monitoring of protected sites for wild plants. 42 endangered wild species are protected and 15 protected sites for wild rice, soybeans and wheat in Guangxi, Hainan, Yunnan, Henan, Jilin, Heilongjiang, Xinjiang and Ningxia are being monitored. The third measure is to strengthen *ex-situ* conservation of wild plant resources. Wild major crops have been collected and rescued and a group of new germplasm nurseries have been established, with more than 30,000 accessions of major crops wild relatives having been collected and stored. The system of *ex-situ* conservation of agricultural crops germplasm composed of germplasm nurseries, long-term banks, copy banks, mid-term banks and plantlets libraries has been further improved, providing reliable support for conservation and use of wild plant biodiversity.

(5) Strengthening protection and restoration of grassland ecosystems. MOA has undertaken a second remote-sensing rapid survey of grasslands. MOA has also improved bodies for grassland supervision and management. By the end of 2012, there are 844 such bodies at the county and above levels, one at national level, 23 at provincial level, 126 at municipal level and 694 at county level. During 2003-2009 more than 90,000 illegal cases of various kinds of damaging grasslands have been penalized. During 2010-2012 more than 20,000 such cases have been convicted annually. China has established a network of grassland conservation with reasonable layout, relatively complete types, wide distribution and coverage and high representativeness. To protect grassland ecosystems, China has been implementing many projects such as returning grazing land to grassland, control of origin of sandstorms affecting Beijing and Tianjin, ecological conservation of sources of three major rivers in Qinghai, grassland conservation in rocky areas of southwest China and prevention and reduction of grassland disasters. According to the monitoring results by MOA in 2012, grassland conservation projects have achieved significant results. Compared with areas without such projects implemented, vegetation coverage of grasslands in project areas increased by 11%, grass height increased by 43.1%, fresh grass output increased by 50.7%. The situation of grassland use is considerably improving, with the rate of overcapacity use of grasslands in 268 counties in 2012 down by 34.5%-36.2% compared with the situation in 2011. However overall most of grasslands are being used beyond their capacities and degradation, desertification and salinization of grasslands have not been effectively controlled. Challenges for grassland ecological conservation remain to be huge.

(6) Preventing and controlling invasive alien species. One measure is to survey and monitor invasive alien species. In recent years, MOA has undertaken consensus on invasive alien species across the country through combination of point and off-point

surveys, focusing on 22 agricultural invasive species such as *Ageratina adenophora*, *Mikania micrantha*, *Parthenium hysterophorus*, *Amaranthus palmeri* and *Xanthium spinosum*. Another measure is to eliminate agricultural IAS. In the past five years, MOA has organized more than 10 activities eliminating IAS like *Pomacea canaliculata*, *Mikania micrantha*, *Ageratina adenophora*, *Alternanthera philoxeroides* and *solanum rostratum* in Yunnan, Hunan, Hubei, Sichuan, Guizhou, Jiangxi and Jilin Provinces, having effectively controlled the expansion of major IASs. The third measure is to undertake researches on technologies for IAS prevention and control. High-efficiency spraying technologies such as low-volume sprayers and static electricity ultralow volume sprayers have been developed, and ecological regulation technologies using grass, bushes and crops as alternatives to invasive species have been developed. Natural enemies to *Brontispa longissima* namely *Tetrastichus brontispae* and *Asecodes hispinarum* have been selected with control effects exceeding 85%. Four natural enemy factories were established in Hainan with daily production scale of parasitoids reaching 2 million, and areas controlled reaching 1,000 km^2. Breakthroughs were made in developing technologies for using IAS for other purposes.

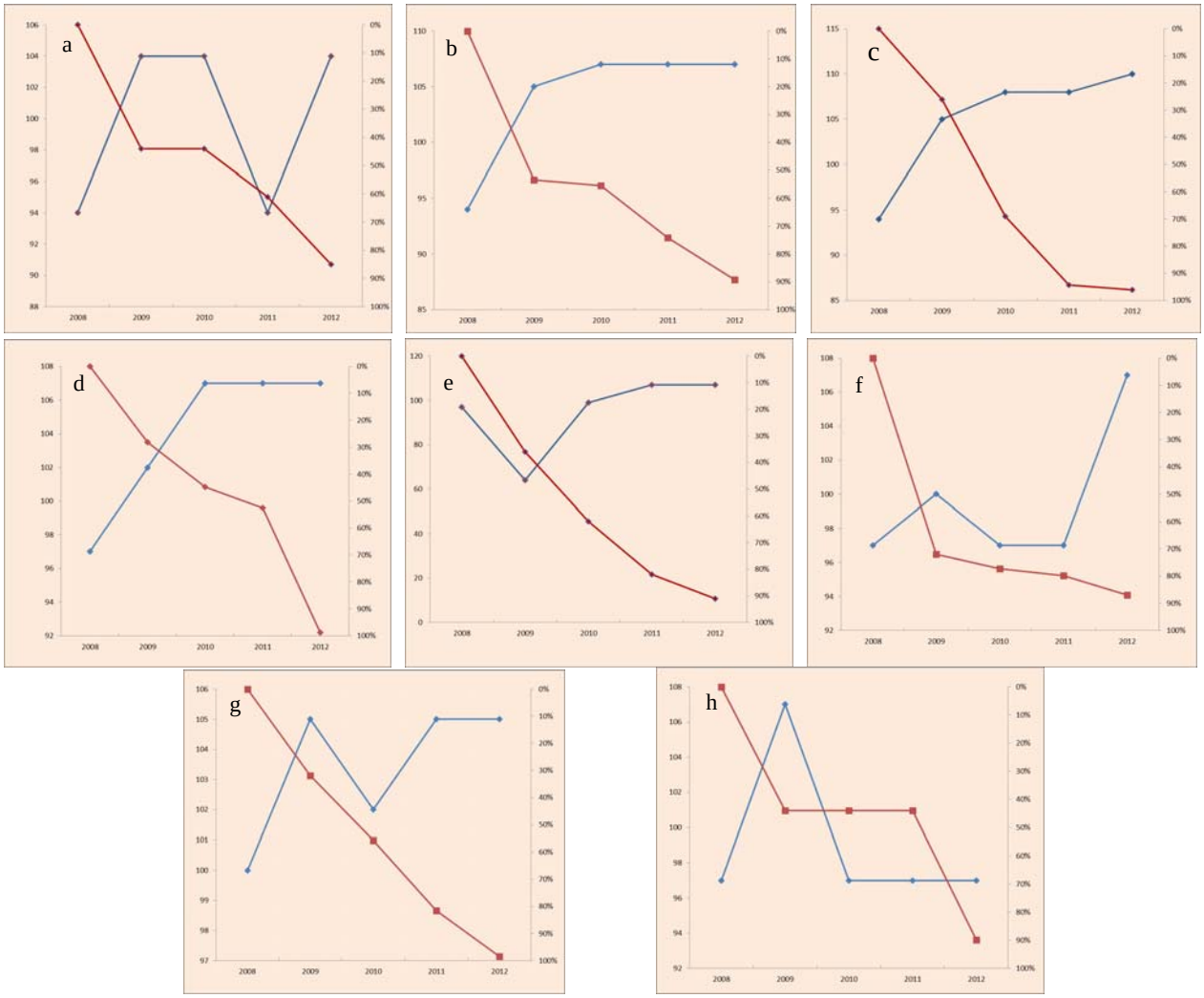
(7) Protecting aquatic resources in accordance with relevant laws. One measure is establishment of protected areas of aquatic species. China has established more than 200 protected areas for various kinds of aquatic wild plants and animals and aquatic ecosystems, forming a network of conservation of aquatic species with reasonable layout and various types. The second measure is strengthening establishment of protected areas for aquatic germplasm. By the end of 2013, China has identified 428 national-level protected areas for aquatic germplasm, which will play an important role in protecting key aquatic plants and animals of economic value and endemic, rare local aquatic species as well as their habitats and reproduction sites. The third measure is increasing restocking of aquatic species. Restocking is undertaken in suitable water areas, and the varieties, number and scope of restocking gradually increased. As a result the population of important fish species is recovering to some extent. For example in Bo Sea and parts of northern Yellow Sea some species that used to disappear such as Chinese shrimp, jellyfish and blue crab are now coming back in the fall fishing season. The fourth measure is strengthening marine ranching. Various places in China undertake marine ranching using artificial fish reefs as carriers for bottom sowing proliferation and sea-grass plantation and complemented by restocking. In connection with ship capacity reduction, abandoned fishing boats are used to reduce costs of artificial fish reefs or nests. The cumulative artificial fish reefs of various kinds installed across the country reach nearly 2 million m^3, providing habitats and reproduction sites for marine species in important regions.

(8) Promoting biosafety assessment and management of agricultural GMOs. Please see details contained in section 2.3.9 of Part II.

Case 3.1 Protection of Crop Wild Relatives

From 2007 to 2013, with the support of the GEF, the Ministry of Agriculture and UNDP jointly implemented a project on conservation and sustainable use of crop wild relatives. Eight sites in eight provinces with different social and economic conditions were selected, for protection of wild rice, wild soybeans and wild relatives of wheat. The strategies for the project were: first, to regulate human behaviour through policy guidance and legislation to minimize damage to crop wild relatives and their habitats; second, to develop alternative livelihood for local farmers and herdsmen to reduce their dependence on crop wild relatives and their habitats; third, to provide financial support to guide local farmers and herdsmen to develop biodiversity-friendly household economy; and fourth, to increase their awareness and encourage local farmers and herdsmen to participate in activities of protecting crop wild relatives.

The result of project implementation indicates that compared with the baseline data of 2008, the status index of resources in all project sites has increased to some extent, with the overall trend going up and the expected results achieved. The threat reduction index of all project sites is above 80%, indicating that threats to crop wild relatives are being reduced and protection activities have good sustainability (see figures below). More importantly, income per capita of residents in all project sites has gradually increased, with the growth rate higher than that of neighboring villages with similar conditions, so local sustainable economic development has been promoted while protecting crop wild relatives.



Note: blue curves reflect status of change in resources, red curves reflect changes in threat reduction index. (a) wild relatives of wheat in Xinjiang; (b) wild relatives of wheat in Yanchi, Ningxia; (c) wild soybean in Bayan, Heilongjiang; (d) wild soybean in Longjin, Jilin; (e) wild soybean in Tongbai, Henan; (f) wild rice in Jinghong, Yunnan; (g) wild rice in Zhaoping, Guangxi; (h) wild rice in Wenchang, Hainan.

3.8 Commerce

(1) Enhancing synergies of CBD with multilateral trade system. China has been actively promoting discussions in the WTO Council on Intellectual Property Rights about the relationship between the Trade-related Intellectual Property Rights Agreement (TRIPS) and the Convention on Biological Diversity. Together with other developing country members, China proposed that the TRIPS should be revised to be consistent with the CBD. Article 19 in the Doha Declaration required the WTO Council on Intellectual Property Rights to review the relationship between the TRIPS and the CBD and examine the protection of traditional knowledge and folklore. Based on that, developing country members proposed that the TRIPS should be consistent with the CBD by following the three principles of national sovereignty, prior informed consent and benefit-sharing. Developing country members also proposed that it would be mandatory to disclose the origin of genetic resources in patent applications for those inventions relying on genetic resources to ensure that the right to know of those providers of genetic resources and their right to benefit from use of genetic resources. China, Brazil, India, the EU, Switzerland and other members that supported the mandatory disclosure of the origin of genetic resources submitted in May 2008 a joint proposal (W52), which requested for enhancing the multilateral system of registration of geographical indicators, expanding the scope of protection of geographical indicators and disclosure of origin of genetic resources in patent applications. In April 2011, China, Brazil, India and other members that had submitted the W52 proposal submitted to WTO a draft decision concerning supporting the mutual supportiveness of the TRIPS and the CBD (TN/C/W/59), which suggested that in Article 29 of the TRIPS one more provision be added requiring the disclosure of origin of genetic resources and/or associated traditional knowledge, making the disclosure of origin of genetic resources and associated traditional knowledge an essential element in patent applications.

(2) Incorporating biodiversity into policies, regulations and guidance issued by the Ministry of Commerce. Since March 2009, the Ministry of Commerce (MOC) together with other ministries and commissions has issued a number of guidelines or guidance concerning biodiversity conservation, requiring Chinese companies or enterprises to protect biodiversity in their domestic and international operations, and encouraging them to take into account biodiversity in the international trade and investment. In March 2009, the Ministry of Commerce and the State Forestry Administration jointly issued ‘Guidelines for Chinese Enterprises for Sustainable Forest Business and Use in Foreign Countries’. The guidelines required using scientific and reasonable logging methods and operational measures to minimize logging impacts on biodiversity. In February 2013, the Ministry of Commerce and the Ministry of Environmental Protection jointly issued ‘Environmental Guidelines for International Investment and Cooperation’, which requires enterprises involved to give priority to *in-situ* conservation and to minimize negative impacts on local biodiversity.

(3) Taking biodiversity into consideration in international trade negotiations. Article 145 concerning genetic resources, traditional knowledge and folklore in China-Peru Free Trade Agreement signed in April 2009 clearly provides that 'both Parties recognize and re-emphasize the principles and provisions established in the Convention on Biological Diversity adopted on 5 June 1992, and encourage the efforts to establish the mutually supportive relationship between the TRIPS and the CBD.'

(4) Undertaking international cooperation in the field of biodiversity. Through bilateral and multilateral channels, the Ministry of Commerce has organized and implemented a number of biodiversity conservation projects, such as China-Norway project on biodiversity and climate change. In November 2012, MOC, UNDP, UNIDO, UNCTAD and UNEP jointly organized a photo exhibition on strengthening South-South cooperation and promoting green development, with more than 120 pictures on display covering energy conservation, environmental protection, responses to climate change, biodiversity conservation and capacity building. The Ministry of Commerce also organized a number of workshops on international research and management of biodiversity, and invited officers and experts from developing countries to introduce transboundary mechanisms, achievements and experiences for biodiversity conservation.

(5) Increasing media coverage and communication of biodiversity. Since 2009, the Ministry of Commerce and its offices overseas and local departments of commerce have collected and reported on news and developments concerning biodiversity conservation, introduced international biodiversity policies and regulations as well as biodiversity aid projects by developed countries. Their work has provided basis for Chinese enterprises and products to go abroad and helped China benefit from the experiences and approaches employed in other countries to improve the public understanding and awareness of biodiversity.

3.9 Customs

The customs, as national authority to manage and supervise imports and exports, have always attached great importance to management of imports and exports of biological resources.

(1) Strengthening supervision of import and export of biological resources. The customs seriously implement the Convention on Biological Convention and the National Programme for Conservation and Use of Biological Resources approved and issued by the State Council. According to relevant laws and requirements, the customs exercise the management of the import and export of biological resources by carefully examining documents required for import and export, such as the certificate of import /export of endangered species, the certificate of proof of species not in the list of wild flora and fauna not allowed for trade, the certificate of approval of blood import and export, the certificate of import and export of human genetic materials and the

certificate for export of legally harvested products. Meanwhile the customs also support other relevant departments by assisting with the import of biological resources used for research and conservation purposes.

(2) Participating in development of biosafety regulatory systems. For years, the customs have been devoted to promoting the development of the legal and regulatory system for biodiversity. The customs, together with relevant departments, have adjusted and issued lists of species for import and export in accordance with the Regulation Concerning Import and Export of Endangered Wild Animals and Plants, including List of Wild Animals and Plants Permitted for Import and Export and Their Products and List of Dual-use Items and Technology for Import and Export. The customs provided specific suggestions to the development of regulations such as Implementation Rules for Regulation Concerning Protection of Fossils, Regulation on Management of Genetic Resources and Rules for Environmental Management and Supervision of Invasive Alien Species.

(3) Constantly strengthening training of on-site customs officers. The customs administration has been providing law enforcement capacity building training to on-site customs officers to improve their law-enforcement capacities. The training content mainly included list of genetic resources for import and export, regulations concerning conservation of genetic resources and professional knowledge needed by customs officers for examination and verification of biological resources.

(4) Investigating relevant cases in import and export. From January 2009 to December 2012, the anti-smuggling department of the customs investigated 406 cases of smuggling of rare animals and plants and their products, and seized 381 tons of smuggled rare animals and plants and their products, whose value was 5.83 billion yuan RMB. They also investigated 3,573 cases of administrative violations in this regard and seized products worth 130 million yuan RMB. In particular in 2012, the General Customs Administration investigated a number of major cases in smuggling of endangered species, through a nationwide anti-smuggling campaign called ‘National Gate Shield’. In May 2012, the CITES Secretariat awarded certificates of excellent performance to the General Customs Administration and the State Forestry Administration. In 2013, China took the initiative called ‘Cobra Action’ to crack down smuggling of endangered species involving 22 countries from Asia and Africa. The customs investigated a total of 71 cases of smuggling of endangered species and 85 suspects involved in relevant crimes and activities. The cases handled by the Chinese customs were one third of the total cases handled during the initiative.

3.10 Industry and Commerce Administration

The industry and commerce administration seriously implements relevant regulations such as Wild Animal Protection Law, and reinforces market supervision

and law enforcement to crack down illegal activities such as illegal purchasing of and business in national key protected animals and plants and their products.

(1) Strengthening leadership and making thorough arrangements. The State Administration for Industry and Commerce (SAIC), while undertaking various market supervision activities, incorporates biodiversity conservation as one of its key work and its various regulations. In holiday market supervisions all the year around, SAIC issued specialized notices many times requiring its local administrations to crack down illegal selling of wild plants and animals and their products. In December 2012, SAIC issued an urgent notice on strengthening protection of wild animals requiring its local administrations to concentrate law enforcement on cracking down those illegal selling and purchasing of national key protected animals and their products. In response local administrations of industry and commerce rapidly organized one-month campaigns against such illegal activities. During the campaign, Jiangsu Province Administration of Industry and Commerce examined 6,458 markets (times), 78,000 business operators (times). 58 business operators without licenses were banned and 9 illegal cases were investigated with fines worth 18,000 yuan RMB given.

(2) Strengthening routine supervision and law enforcement and maintaining market order. One measure is to manage market access and regulate business qualifications. In accordance with the Wild Animals Protection Law, all the groups that do business in purchasing, selling, transporting, domesticating and raising national key protected animals are required to obtain approval documents or licenses from the competent authorities or institutions authorized to issue such documents before they apply for business certificates. Another measure is to regulate business behaviours and to reinforce law enforcement at local levels. Local administrations strictly implement routine patrolling and territorial supervision while enforcing laws related to wild animals and plants and ensure that specific tasks and responsibilities are assigned to persons in relevant positions. Since March 2009, Yunnan Province AIC has inspected 3,068 markets of wild animals and their products, 32,000 restaurants selling wild animals and their products, and 284 companies that reproduce and domesticate wild animals. 120 companies doing business in wild animals and their products without licenses have been banned and 3,300 animals of various kinds have been confiscated.

(3) Strengthening investigations into relevant cases and cracking down illegal activities and violations. Local administrations strictly implement relevant laws such as Wild Animal Protection Law and crack down illegal activities and crimes against wild animals and plants. Since March 2009, Guangdong Province AIC, while undertaking special inspections for protection of wild flora and fauna, has inspected 35,000 markets of various kinds and 155,000 business operators, investigated 154 cases of violating relevant laws (with value worth 120,000 yuan RMB) with fines of 150,000 yuan RMB given. Guizhou Province AIC examined 2,094 markets of various kinds and 22,000 business operators of various kinds, having seized 857 kg of products of wild animals and confiscated 5,455 animals. Heilongjiang Province AIC

investigated more than 100 cases, having confiscated more than 30,000 animals of various kinds, which are worth more than 3 million yuan RMB. Qinghai Province AIC organized a campaign against illegal sales of Huang fish, by having signed more than 3,000 copies of agreements with business operators about accountability for sales of Huang fish and their products, investigated more than 200 illegal cases and given fines of more than 200,000 yuan RMB.

(4) Providing training on law enforcement and strengthening communication and education. First, local administrations increased training of law enforcement personnel through organizing training workshops and disseminating training materials. AICs in Xinjiang, Jilin and Heilongjiang invited experts many times to provide training to law enforcement personnel and reinforce their capacities to fulfill their duties by law. Second, local administrations make efforts in communicating by various effective ways laws and regulations concerning protection of wild animals and plants, popularizing scientific knowledge of biodiversity and increasing public awareness of ecological conservation, on the occasions of the International Day of Biodiversity, the World Environment Day, National Day for Legal Communication and the International Day for Protection of Consumers' Rights. For example, Liaoning AIC and Forest Department held a joint press conference on actions for protection of wild birds, organized spring actions to love and protect birds and disseminated more than 40,000 copies of education materials.

3.11 Quality Supervision, Inspection and Quarantine

(1) Importance attached to macro-level planning. The quality supervision, inspection and quarantine sector incorporates biodiversity and conservation of biological resources into its sectoral development strategy and plan. In 2011, the State Administration on Quality Supervision, Inspection and Quarantine (SAQSIQ) issued its Twelfth Five-year Plan which addressed biodiversity conservation and inspection and quarantine of imported and exported biological resources from legal, institutional and technical aspects. The plan clearly proposed to establish a system of inspection and quarantine of species and a system of assessment of intercepted species. To implement fully China's updated NBSAP (2011-2030), SAQSIQ developed an action plan for inspection and quarantine of import and export of biological resources.

(2) Strengthening leadership and organization. To strengthen leadership over conservation of biodiversity and biological resources in this sector, SAQSIQ established a division for supervision and management of biological resources and a division for inspection of tourists and mails. A center for identification and verification of species and biological resources was established in the Chinese Research Academy of Inspection and Quarantine Sciences. In 2012, a leading group on conservation of biodiversity and biological resources was also established to provide guidance on relevant work in this sector.

(3) Providing scientific guidance. To provide guidance for inspection and quarantine of import and export of biological resources, SAQSIQ issued recommendations on strengthening work in this regard. The recommendations required all staff working in the sector to know the situation and huge challenges they face as well as tasks ahead for biodiversity conservation. They should attach strategic importance to strengthening inspection and quarantine of import and export of biological resources including endangered wild flora and fauna. It was also recommended that the whole sector should increase investments, strengthen and upgrade capacities, strengthen coordination and synergies. The sector should give priority to communication and education so as to create a favorable atmosphere. Meanwhile specific responsibilities should be assigned to specific positions and performance evaluation should be strengthened in efforts to upgrade the level and capacity of inspection and quarantine of biological resources.

(4) Undertaking surveys seriously. To know in-depth the import and export of biological resources, since 2008, SAQSIQ has organized surveys in this regard and basically obtained information concerning the varieties and destinations of species imported and exported. It was found that the frequency and varieties of species exported were twice as many as those imported, indicating that the loss of biological resources from China is rather serious.

(5) Undertaking pilot work actively. To get more experience in inspecting biological resources at customs and ports and make preparations for relevant work at broader scale, SAQSIQ, together with relevant departments, undertook some pilot work on inspection of biological resources in sea-, land- and air-ports in Yantai, Shandong and Xinjiang and got rich results, laying a good foundation for establishing a system of inspection of biological resources in different ports.

(6) Keeping invasive alien species out of border. SAQSIQ and its local administrations strengthened inspection and monitoring of invasive alien species. From 2008 to 2012, the varieties and the frequency of harmful pests constantly increased significantly. The varieties of pests intercepted increased from 2,856 in 2008 to 4,331 in 2012, with annual increase by over 10%. The number of interceptions increased from 229,000 in 2008 to 579,000 in 2012, with annual increase by over 30%. SAQSIQ issued recommendations for strengthening inspection of travellers and mails. By the end of 2012, 31 out of 61 international mail exchange stations have established units for inspection of mails. Since 2007, SAQSIQ has undertaken a lot of research on prevention and control of IAS and developed many standards in this regard. For example, in the field of plant inspection and quarantine, since 2006, 352 sectoral standards, 104 national standards and 2 international standards have been developed and issued, forming China's system of standards for inspection and quarantine of imported and exported plants.

(7) Monitoring GMOs. SAQSIQ implements a system of declaration of imported

genetically modified plants, animals and micro-organisms and their products and food. During 2008-2013, SAQSIQ established a technical center for detecting and monitoring imported and exported GMOs and key labs for GMOs. The capacities of more than 30 labs within the sector to detect and monitor GMOs have been fully upgraded and a relatively complete system of techniques and standards has been established. In recent years, GMO detection has been undertaken of more than 300 million tons of soybeans, maize, canola and cotton seed and 6 million tons of rice products and other agricultural products. Relevant inspection and quarantine bodies have detected maize and their products imported from USA and identified MIR162, which was not approved by China for import. GMOs were also found from horse feed imported from Ireland and non-GM soybeans from Taiwan Province. All these imports have been returned to the exporters.

3.12 Forestry

(1) Continuing implementation of key forestry and ecological projects. In the past decade, China has completed reforestation covering an area of 83,000 km^2 through the natural forest resources protection project. Currently the forest area of 1.049 million km^2 has been effectively protected, with net increase in the forest area by 100,000 km^2, and the forest coverage rate increased by 3.8% and the forest reserves by 730 million m^3. China has also completed reforestation covering an area of 218,000 km^2 through implementing the project of returning cultivated land to forests, with the forest coverage rate in the project implemented area increased by 3%. Reforestation of additional area of 83,000 km^2 completed through forest belt building in north, northeast and northwest China as well as in the Yangtse River Basin, with the forest coverage rate in the project areas increased to 12.4% and ecological conditions in these areas obviously improving. During the decade when the sandstorm control project was implemented, additional area of 89,000 km^2 was reforested and the forest coverage rate in the project area increased by 4.1%, with sound evolutionary changes occurred in the flora of the area. An area of 30,000 km^2 of the rocky regions has been controlled cumulatively with the vegetation coverage rate being 15% higher than that before the project was implemented. During 2006-2010 altogether 205 demonstration projects of wetland conservation and restoration were completed, with 800 km^2 of wetlands restored.

(2) Improving the management of nature reserves. To implement a notice issued by the State Council on improving the management of nature reserves, the State Forestry Administration issued in 2011 a notice on strengthening management of nature reserves within the forestry sector, which contained requirements for master planning, land ownership, management bodies and personnel, funding and institutional arrangements for nature reserves. A number of provinces and municipalities also put in place specific measures to implement this notice. "One law for one area" system is being further implemented. Gansu and Fujian Provinces have approved rules of

management for two national-level nature reserves. A legislation is being considered for Hanma national-level nature reserves in Inner Mongolia. Standardized management of nature reserves is being promoted. Ningxia Autonomous Region has issued a notice on further strengthening forestland management for forestry nature reserves, with a view to strengthening land management for nature reserves. Guangxi Autonomous Region is moving forward border determination for 12 local nature reserves and present it for approval by higher authorities. A target has been set that within the next three years master plans will be developed for all local nature reserves. Guizhou Province has undertaken a comprehensive survey on and verification of nature reserves managed by the forestry sector at all levels and developed a directory and an information database of such nature reserves in the province.

(3) Developing and implementing plans for wild flora and fauna protection and development of nature reserves. In 2012, the State Forestry Administration (SFA) issued the National Twelfth Five-year Plan for Wild Flora and Fauna Protection and Nature Reserves. The plan proposed that during 2011-2015, China will give priority to protection of more than 60 wild animals, 120 wild plants and establishment of 51 national-level nature reserves. In 2012, SFA and NDRC jointly issued a national plan for rescuing and protecting wild plants with very small populations (2011-2015). Through implementation of this plan and strengthening rescuing and protection of species with very small populations, wild plant protection will be enhanced. In addition, SFA has developed a draft plan for rescuing and protecting wild animals with very small populations.

(4) Exploring nature reserves management mechanisms and ecological compensation mechanisms. Governments of different levels have explored nature reserve management mechanisms. Guangdong Province has classified national-level and province-level nature reserves within the forestry sector as Level A institutions for public benefits. Hainan Province consolidated nature reserve management by putting those province-level nature reserves originally managed by cities and counties directly under management of the province's forest department. In 2011, Hubei Province included the budget and personnel of 5 national-level nature reserves in the province's government budget and personnel quota. In September 2011 Guangxi Autonomous Region listed 9 national-level nature reserves as institutions as part of its civil service system, providing strong support for long-term development of these nature reserves. Zhejiang Province Forest and Finance Departments jointly issued a notice on renting of collective forests in forest nature reserves at province and above level. In accordance with this notice, core zones and buffer zones in nature reserves at province and above level will be rented, with the price being 50,000 yuan/year /km^2， further safeguarding the legal rights of the forest owners. Since 2008, pilot work has started in compensating for property and human life losses caused by wild animals in poor areas. Anhui and Gansu Provinces have developed rules for such compensation. In 2012 the central government inspected the pilot work in this regard in those pilot provinces and drafted provisional criteria for the central government to compensate for losses caused

by national key protected animals.

(5) Strengthening prevention and control of forest pests. China has established 1,000 central monitoring and warning sites at national level and more than 1,200 sites at provincial level. There are altogether 28,000 sites with those at city and county level counted. This forms a national network of monitoring and early warning of forest pests. China has also established 3,117 institutions and 858 stations of preventing, controlling and quarantine of forest pests. The personnel working in this field is stable and infrastructure for prevention and control has been obviously strengthened, therefore a system of prevention and control is in place with monitoring and early warning, prevention through quarantine, disaster prevention and reduction and technical support at its core.

(6) Strengthening reintroduction of artificially bred populations and restoration of wild animal species. SFA has strengthening rescuing and breeding of endangered wild animals. As a result the number of Giant Pandas raised in captivity has reached 312, the population of artificially bred Crested Ibises has exceeded 600 and the populations of more than 50 artificially bred wild animals are constantly expanding, such as the Chinese Alligator (*Alligator sinensis*), tigers, golden monkeys and Tibetan Antelopes (*Pantholops hodgsoni*). 8 endangered wild animals have been successfully reintroduced to nature such as Crested Ibis, Asian Wild Horse (*Equus przewalskii*), Pere David's Deer (*Elaphurus davidianus*), Chinese xenosaurs (*Shinisaurus crocodilurus*), Chinese Alligator, Bactrian Red Deer (*Cervus elaphus yarkandensis*) and Yellow-bellied Tragopan (*Tragopan caboti*), with reproduction in nature achieved and new, wild populations established gradually. More than 1,000 rare or endangered or endemic plants from northeast, northwest and southwest China have been conserved *ex-situ*. More than 400 sites for breeding of wild plant germplasm have been established, with protected centers or bases established for protection of germplasms of cycads, Orchids, Magnoliaes and palms. Research has been undertaken on artificial breeding techniques and seedling for those rare wild plants for which market demands are relatively big, such as Matsutake (*Tricholoma matsutake*), Snow Lotus (*Saussurea involucrata*), Dove Tree (*Davidia involucrata*), Desertliving Cistanche (*Cistanche deserticola*), yews and rare orchids. 280 breeding bases have been established for rare wild plants, stabilizing artificial populations of more than 1,000 wild plants. Reintroduction has been undertaken for endangered endemic orchids in China such as *Doritis pulcherrima* and *Paphiopedilum armeniacum* and some critically endangered species such as *Cycas debaoensis*, *Pachylarnax sinica* and *Cyclobalanopsis sichourensis*.

(7) Promoting conservation, research, development and use of genetic diversity of cultivated plants, domesticated animals and their wild relatives. Forest departments at all levels have made shifts from use of wild resources to use of artificially bred resources. Farming and cultivation of plants and animals are promoted for use of traditional sectors that had consumed tremendous wild animal and plant

resources such as Chinese medicine and musical instrumentation using animal leather. Development of technologies for artificial breeding of wild plants and animals is promoted and guided, and those companies engaging in artificial breeding of wild animals and their products are exempted from corporate income taxation and those artificially domesticating and reproducing wild animals and their products are exempted from administrative fees for animal protection. Meanwhile, tools such as specialized labelling and standards are promoted to reinforce supervision and management and to crack down the smuggling of and illegal business in wild flora and fauna and their products. This has not only effectively reduced pressures on wild resources, but also enhanced development of local unique industries and increased farmers' income.

(8) Undertaking surveys and monitoring of biodiversity. SFA has been gradually surveying and monitoring forest, wetland and desert ecosystems and biodiversity. During 2009-2013 the eighth national survey of forest resources was undertaken, capturing the latest status of forest coverage rate, forest growing stock and diversity of forest types. The fourth national survey on desertification and land degradation completed in 2009 indicates that by the end of 2009, the area of desertification in China is 2.624 million km^2, an annual reduction by 2,491 km^2 compared with the situation five years ago. The current situation is that the overall trend of desertification has been contained while deserts in some regions are still expanding. The average vegetation coverage rate in deserts increased from 17% in 2004 to 17.6% in 2009, with obvious increases in plant species and stability of plant communities in key controlled areas.

(9) Identifying and enclosing desertified land as protected areas and protecting biodiversity in deserts. For those contiguous desertified land whose conditions do not allow for any control measures or are not suitable for development or use as required by ecological conservation, they have been enclosed and identified as protected areas, where activities such as land use, grazing, mining and water use will be strictly prohibited. Development activities are strictly controlled as well to protect desert vegetation and promote regeneration of natural desert ecosystems.

(10) Promoting management of forest GMOs and forest genetic resources. In accordance with the SFA regulation on approval of genetic modification of forests and technical specifications for safety assessment of genetically modified forests and their products, SFA undertakes strict risk assessments of the experiment, environmental release and experimental production of genetically modified trees. SFA also monitors the risks of those GM trees allowed for plantation. SFA has been strengthening the management of forest genetic resources, by surveying and cataloguing unique forest genetic resources in China and undertaking pilot work in access to forest genetic resources and associated traditional knowledge and benefit-sharing from their use.

Case 3.2 Artificial Breeding and Commercialization of Yews

Yews are listed as national level I key protected plant and vulnerable species by IUCN as well as included in Annex II of the CITES. Wild yews are very rare and have important medicinal values. Jiangsu Yew Biotech Company Ltd. began in 1997 to research on seed development and artificial breeding and plantation of yews and made remarkable achievements in technologies for yew cultivation. They have made breakthroughs in rapid reproduction of yews and solved problems of serious shortage of yew seeds. SFA approved in 2008 a high-tech industrial park for yews created by this company as the first demonstration zone for yew-related science and technology development in China. The company's sale income from commercialization of yews in 2010 exceeded 2 billion yuan RMB, with a huge industry chain composed of yew cultivation, bonsai and trees and manufacturing medicines, health and nutrition products from yews.

Zhejiang Haizheng Pharmaceuticals Company Ltd, with the support of Northeast China University of Forestry, established a large base to commercialize plantation and extracting of yews, following the cooperation model with the private sector, university, production base and farmers all involved. By 2010, this company's sale income has reached 1 billion yuan RMB, turning itself into another platform for scientific and technological innovation of the forest sector in China.

3.13 Intellectual Property Office

The State Intellectual Property Office (SIPO) always attaches great importance to intellectual property right (IPR) protection related to genetic resources, traditional knowledge and folklore.

(1) Actively participating and promoting international consultations concerning a system of protection of genetic resources and traditional knowledge. SIPO has been leading and representing China in the international negotiations in the Intergovernmental Committee on Genetic Resources, Traditional Knowledge and Folklore under the World Intellectual Property Organization (WIPO), as well as international consultations related to genetic resources and traditional knowledge in the WTO TRIPS Council and other relevant multilateral forums. China together with other developing countries jointly proposed that disclosure of the origin of use of genetic resources should be mandatory in patent applications.

SIPO also actively participated in the negotiations of free-trade agreements between China and New Zealand, Peru, Costa Rica and Switzerland. In all these bilateral free-trade agreements that went into effect respectively in 2008, 2009, 2010 and 2013, all of them contain provisions related to protection of genetic resources and traditional knowledge.

SIPO strengthened cooperation and exchanges with its counterparts in other countries in the field of genetic resources and protection of traditional knowledge. In recent years SIPO organized many training workshops on IPRs for countries from Asia, Africa, Latin America and ASEAN member states. During these workshops introductions were made on the status of conservation of genetic resources, traditional knowledge and folklore as well as developments in relevant international negotiations.

Through these workshops mutual understanding and exchanges were strengthened so as to create good conditions for international cooperation in relevant fields.

(2) Actively participating biodiversity-related legislation, law enforcement, communication and training. SIPO has been actively promoting studies on biodiversity-related IPR legislation and policy development. In 2011, SIPO together with Chinese Medicine Administration and other departments, jointly issued recommendations on strengthening IPR protection related to Chinese medicine in an effort to promote establishment of a system of protection of genetic resources and traditional knowledge in the field of Chinese medicine industry. While implementing China Patent Law and its implementation rules related to the origin of genetic resources, SIPO required patent applicants to disclose the origin of genetic resources in their patent applications. SIPO also assessed the effectiveness of implementation of relevant laws and policies through relevant research projects.

SIPO organized seminars or training workshops on IPR protection related to genetic resources and traditional knowledge respectively in Hubei, Sichuan and Gansu in 2011, 2012 and 2013. Relevant experts were invited to introduce relevant international and national systems and developments. SIPO strengthened exchanges with the departments of the environment, culture, agriculture, forestry and Chinese medicine, as well as promoted communication and education and relevant research taking into consideration local needs for industry development and the experiences and lessons learned at local levels.

3.14 Tourism

Tourism has become a strategically important industry of national economy, and is also one of human activities with big impacts on biodiversity, so tourism plays an important role in biodiversity conservation.

(1) Incorporating biodiversity conservation into tourism development strategies and plans. In December 2009, Recommendations on Accelerating Tourism Development issued by the State Council clearly proposed enhancing environmental protection and energy conservation while developing tourism. In the Twelfth Five-year Plan for Tourism Development issued in 2010 there is one chapter particularly on protecting the environment and resources and achieving sustainable development. In recent year in developing trans-region tourism strategies and plans, such as Plan for Tourism Development in Northeast China, ecological and biodiversity conservation has been included as important element.

(2) Taking into account CBD requirements while developing sector standards and regulations. Biodiversity is one key indicator for classification of

tourism spots in the national standard for classifying tourism spots and assessing their quality. In 2012 the State Tourism Administration (STA) and the Ministry of Environmental Protection (MEP) jointly developed the national standard for establishing demonstration areas for eco-tourism and operation. Meanwhile guidelines for management of demonstration areas for eco-tourism and detailed rules for evaluating management and operation of such areas (GB-T26362-2010) have been developed. All this provided a basis for eco-tourism development. In 2013, STA and MEP jointly identified 38 national demonstration areas for eco-tourism.

(3) Undertaking thematic activities of Eco-tourism Year to promote the effective implementation of the CBD. STA adopted 2009 as "China's Year of Eco-tourism" and selected its theme as ‘experiencing green tourism and feeling ecological civilization’. The Year of Eco-tourism provided eco-tourism areas an opportunity for environmental education and increasing public awareness of ecological conservation. Eco-tourism promotes local economic development through involving local communities and providing local residents job opportunities, making them willing to support and practice eco-tourism.

(4) Integrating conservation into development of individual geological ecological space, in connection with biodiversity priority areas. In connection with 35 biodiversity priority areas identified, in 2012 STA developed tourism development plans for Qinling Mountains, Wuling Mountains and Dabieshan Mountains for 2013-2020, with a view to breaking administrative borders and promoting integrated tourism development using ‘mountains’ and ‘water systems’ as units of geological and ecological space so that ecological conservation and environmental protection can be integrated into tourism development.

(5) Encouraging innovation and exploring models of coordinated development between tourism and biodiversity conservation. Many famous ecological tourism spots, such as Huangshan Mountain of Anhui Province, Wuyi Mountain of Fujian Province, Jiuzhaigou of Sichuan Province, and Pudacuo of Yunnan Province, have explored and developed a good model of coordination between tourism development and biodiversity conservation, with due consideration to their own circumstances.

3.15 Oceanic Administration

China's oceanic administrations at various levels have incorporated conservation of marine biodiversity into relevant strategies and plans, taken various conservation measures and achieved obvious results.

(1) Improving laws and regulations for conservation of marine biodiversity. China has preliminarily established a legal system for the marine environment consisting primarily of the Marine Environment Protection Law and complemented by

relevant regulations and local administrative rules for the marine environmental protection. In recent years China has promulgated Island Conservation Law and Rules for Management of Marine Special Protected Areas. Tianjin, Hebei, Zhejiang, Guangdong and Hainan and other provinces have issued their local regulations on the marine environment protection. These laws and regulations have further improved the marine environmental legal system.

(2) Incorporating conservation of marine biodiversity into sectoral strategies and plans. In 2012 the State Council approved the National 12th Five-year Plan for Marine Development. This plan proposed that by 2020 land-based pollution will be effectively controlled; the environmental degradation of near-shore marine areas will be fundamentally reversed and the trend of marine biodiversity decline will be basically contained. The plan also identified some important actions such as strengthening conservation of marine biodiversity, enhancing restoration of marine ecosystems and strengthening marine ecological monitoring and management of ecological disasters. The National Twelfth Five-year Plan for Marine Economy Development, the National Plan for Marine Zoning 2011-2020 and the National Programme for Island Conservation 2011-2020, all of which have been approved and issued by the State Council, have put marine biodiversity into a very prominent position and identified specific targets and requirements for conservation of marine biodiversity. Local governments in coastal areas also give high importance to marine ecological conservation. Their marine development plans also give high priority to biodiversity conservation and identify protecting and restoring biodiversity as important targets and tasks. They have also implemented a number of projects in preventing and controlling land-based marine pollutants and protecting and restoring marine biodiversity.

(3) Undertaking surveys and monitoring of marine biodiversity. During 2006-2008, China surveyed marine biological resources in coastal and near-shore areas and obtained the baseline information concerning marine biodiversity in China. ‘China's Marine Species and Atlas’ published as a result of this survey comprehensively and systematically described the varieties of marine species and their distribution in China. To know dynamic changes in China's marine biodiversity, since 2004, China has established 18 marine ecological monitoring zones in some ecologically vulnerable and sensitive near-shore and coastal areas, with the total area covered reaching 52,000 km^2 and covering typical marine ecosystems such as bays, estuaries, coastal wetlands, coral reefs, mangroves and sea-grass bed. Since 2008, China has been monitoring regularly national-level marine protected areas and marine special PAs every year and has basically known dynamism of biodiversity in marine PAs.

Case 3.3 Coastal Wetland Restoration Project in Wuyuanwan, Xiamen, Fujian

During 2005-2007, the wetland restoration project undertaken in Wuyuanwan, Xiamen, Fujian Province covered opening of coastal dam, dredging of inner bay, coastal conservation and strengthening dams at lower water level and construction of a wetland park. Following ecological recovery and giving ponds back to sea, the hydrological conditions, landscape and environmental quality of Wuyaunwan have significantly improved and biodiversity has gradually recovered. Now Wuyuanwan has become not only a scenic and leisure spot of Xiamen, but also a good educational base for nature and ecology, providing a platform for Xiamen International Ocean Week and the activities of the Earth Day and bird watching. This has strongly enhanced the public awareness of marine biodiversity conservation.

Impacts of coastal wetland restoration in Wuyuanwan, Xiamen
(left is the situation before and right is the situation after)

(4) Strengthening establishment of network of marine protected areas. The State Oceanic Administration (SOA) has issued rules on management of marine special protected areas, established a committee to examine and review marine special PAs and revised technical guidelines for function zoning of marine special PAs and development of master plans. In the past two years, SOA has implemented capacity building projects for 10 protected areas with funds from the central government budget

appropriated for different marine areas. The cumulative investments exceed 100 million yuan RMB. By now most marine PAs have established their management bodies, with a certain number of staff members and funds for management and operation in place so that law enforcement capacities in PAs are strengthened. The number of marine PAs in particular national-level ones has increased substantially since 2008. China has established many new national-level marine PAs and marine special PAs. By the end of 2012, China has a total of 240 marine PAs of various types at different levels, with total area covered reaching 87,000 km^2, accounting for nearly 3% of the marine areas under China's jurisdiction.

(5) Undertaking marine ecological conservation and restoration. In 2012, SOA issued provisional rules for management of demonstration areas of marine ecological civilization and a provisional set of indicators for establishment of such demonstration areas. By now the first group of provinces such as Shandong, Zhejiang, Fujian and Guangdong have applied for establishment of such demonstration areas. SOA is exploring the establishment of marine ecological red line, focusing on important marine biodiversity areas such as important estuaries, coastal wetlands, marine PAs and fishery areas. Shandong Province has established such a red line in Bo Sea, with strict protection provided to over 40% of Bo Sea's marine areas. Since 2010 SOA has supported 180 projects using funds appropriated from the central government budget for different marine areas totalling about 4.43 billion yuan RMB. The projects included coastal restoration, island conservation and restoration, marine ecological restoration, mangrove and tidal flats restoration, covering an area of more than 2,800 km^2.

(6) Responding to climate change impacts on biodiversity. SOA has established a leading group on addressing climate change and developed a plan for adaptation to climate change. SOA has been monitoring regularly climate-change-related phenomenon such as sea water temperature, sea level, sea water erosion and soil salinization. SOA has also strengthened research on how oceans and seas could adapt to climate change, developed methods of calculation of carbon-sequestration and carbon-fixing capacities of coastal wetlands, developed and integrated technologies in this regard.

3.16 Chinese Medicine Management

Chinese medicinal resources are core material foundations for Chinese medicine development, so the Chinese medicine management sector attaches great importance to sustainable use of Chinese medical resources.

(1) Taking biodiversity factor into account when developing sector plans and relevant national laws and regulations. The Code of Medicine of China contains the following provisions concerning the Chinese medicinal resources: for rare and expensive medicinal resources, standards for medical use of wild species need to be

phased out; for medicinal resources that are in short supply, if possible, medicine will use only parts above the ground, rather than the whole to allow for continued growth of the underground part; farmed or artificially bred species can be used for some Chinese medicine in order to reduce harvesting of wild species. In the Twelfth Five-year Plan for Chinese Medicine Development issued by the State Administration on Chinese Medicine, goals or targets were set for cultivating wild species and resources, enhancing capacities for research and development and sustainable use. The plan contains tasks such as undertaking consensus on wild species for Chinese medicinal use, accelerating establishment of germplasm banks, strengthening establishment of breeding bases for wild herbal resources and reinforcing macro-adjustment of important and limited wild Chinese medicinal raw materials. The Programme for Innovation and Development of Chinese Medicine (2006-2020) called for protection of rare and endangered species for Chinese medicinal use, studies on alternatives and breeding techniques, establishment of germplasm banks for Chinese herbal medicines and improving key technologies for conservation and sustainable use of Chinese medicinal herbs. The State Council Recommendations on Supporting and Promoting Chinese Medicine Development proposed to strengthen protection, research and development and reasonable use of Chinese medicinal resources, to protect wild flora and fauna for Chinese medicinal use, to accelerate establishment of germplasm banks, to establish PAs in areas where wild flora and fauna for Chinese medicinal use concentrate, to establish a group of breeding bases and to strengthen protection, breeding and alternative studies of those rare and endangered species to allow medicinal resources to replenish and grow.

(2) Undertaking pilot work in consensus of Chinese medicinal resources. China has initiated pilot work in consensus on Chinese medicinal resources. Such pilot work has begun since 2011 in 698 counties of 25 provinces (autonomous regions, province-level municipalities). The consensus mainly covered: (i) the varieties and distribution of Chinese medicinal resources and reserves of 563 important Chinese herbs; (ii) traditional knowledge associated with Chinese medicine focusing on knowledge and experiences of medicinal use at local level and by ethnic minorities; (iii) establishing 16 breeding bases for Chinese medicinal seedlings and 2 germplasm banks, undertaking studies on artificial breeding of those Chinese medicinal resources with difficulty in reproduction and setting up relevant germplasm banks; (iv) establishing a national system of dynamic monitoring and information service for Chinese medicinal resources.

(3) Collecting and conserving Chinese medicinal resources. China has established a technological system for *in-vitro* protection of medicinal plant germplasm resources, with nearly 30,000 accessions of *in-vitro* germplasm of 3,599 species of medicinal plants collected. China has successfully established the first national germplasm bank of medicinal plants and created a system of technologies for *ex-situ* conservation of medicinal plant germplasm, with 5,282 species protected *ex-situ* and the total number of species for medicinal use conserved ranking top in the world.

(4) Undertaking plantation of Chinese medicinal materials to reduce pressures on wild resources. With the joint promotion and support of many ministries, a preliminary progress has been made in developing new technologies for planting Chinese medicinal materials, exploring models of scale plantation and regulating such plantation. Both outputs and harvests have increased so as to reduce pressures on wild resources. For example areas of plantation of commonly used Chinese medicinal herbs such as *Angelica sinensis*, *Glycyrrhiza uralensis*, *Lonicera japonica* and *Rheum officinale* have exceeded 66.7 km^2.

3.17 Poverty Reduction and Development

Biodiversity-rich areas in China are more often those poor areas. So China attaches great importance to biodiversity conservation while reducing poverty.

(1) Full consideration given to biodiversity conservation when planning for poverty reduction. In 2011 the Government of China launched National Programme for Rural Poverty Alleviation and Development for 2011-2020, which clearly proposed that poverty reduction should be integrated with environmental protection and ecological conservation, and natural resources in poor areas should be fully used for developing environmentally friendly industries and promoting healthy lifestyles and harmony between socio-economic development, the environment and human population. In planning for regional development and poverty reduction in contiguous, extremely poor regions, priority consideration is given to biodiversity and ecological conservation.

(2) Implementing key ecological projects in poor areas, such as returning cultivated land to forests, returning grazing land to grassland, soil conservation, natural forests protection, building of forest belts and control of desertification and rockiness of land. Ecological compensation system has been gradually established and improved to increase investments into key ecological function zones. Efforts were made in grassland conservation, strengthening establishment and management of protected areas, implementing projects such as returning grazing land to grasslands, including banning, alternating and stopping grazing to restore natural grassland vegetation and ecological functions.

(3) Developing clean energy based on local conditions. Efforts were made to accelerate development of renewable energy in poor areas. Energy projects were implemented in poor areas based on local conditions such as development of small-scale hydropower, solar power, wind power and biomass power, and promoting use of biogas, energy-saving stoves, solid fuels and gas from straw (including central gas supply stations). These projects will bring about changes in water use, improvements in toilets, kitchens and (pig or cow) pens and comprehensive reuse of straws.

(4) Giving more attention to human resources development in poor areas to alleviate conflicts between human beings and natural resources. Core efforts were made in enabling the poor population to get jobs, by providing job training to those middle and high school graduates who cannot continue higher education. Special subsidies such as living expenses and transportation costs were provided to the new labor force from poor rural families who are receiving vocational training. Labor forces in poor rural areas were provided training on practical skills. In recent years as a result of training provided, the labor force from poor areas shifting to other jobs exceeds 1 million annually, lifting more than 4 million people out of poverty and effectively relieving conflicts between human beings and natural resources in poor areas, thus promoting biodiversity conservation in these areas.

(5) Relocating poor people living in extremely hard conditions on a voluntary basis. This helps reduce ecological pressures of those ecologically extremely vulnerable areas. Meanwhile other migration and relocation projects are guided for implementation in those poor areas that meet migration conditions. Coordination with relocating people to other areas for poverty reduction is strengthened in common efforts to improve the living and production environment of the poor people. Efforts in this regard are well coordinated to address the problems and difficulties of those poor people relocated to ensure that they will stay where they are relocated with job opportunities and livelihood provided. Currently China is developing a plan for relocating poor people for poverty reduction with a view to reducing population carrying capacity of those regions and improving external conditions for biodiversity conservation.

Case 3.4 Poverty Reduction and Biodiversity Conservation in Bijie City, Guizhou Province

Since 1988 Guizhou Province established an experimental zone in Bijie City for poverty reduction, ecological conservation and population control to alleviate conflicts between survival, development, human population and natural resources. For more than two decades, as the only one experimental zone on poverty reduction and ecological conservation in China, faced with the reality of backward socio-economic development, extreme poverty and poor environmental conditions, Bijie has been giving equal importance to development and poverty reduction, ecological restoration and conservation, population control and improvements in human quality, and has successfully found a new path with both poverty reduction and ecological conservation by jumping out of a vicious cycle of ‘the more people given birth to, the more land used; the poorer the more land used; and the poorer the more people given birth to’. From 1988 to 2011, the annual average income of local farmers increased from 182 yuan to 4,300 yuan and the forest coverage rate up from 15% to 41.5%.

3.18 Implementation of Other Related Conventions

3.18.1 The UN Convention to Combat Desertification (UNCCD)

(1) Full consideration given to biodiversity factors when planning desertification prevention and control. National Plan for Desertification Prevention and Control (2011-2020) proposed the principle of 'prevention as priority and control in an integrated way'. The plan set a target that by 2020, more than a half of controllable desertified land will be controlled, further improving ecological conditions in deserts. Within the plan period, 200,000 km^2 of desertified land will be controlled, with one half to be completed during 2011-2015 and another half during 2016-2020.

(2) Improving policies to support desertification prevention and control. China has developed a series of policy measures to support ecological conservation and industry development in deserts, such as reform in collective forest ownership, compensation for forest ecological benefits, subsidized loans for forestry, subsidies for reforestation, and subsidies for grassland conservation. Preferential policies for desertification prevention and control such as investment, taxation and financing are improved based on local circumstances, significantly mobilizing the enthusiasm of enterprises and individuals of participating in desertification prevention and control and creating the new situation in which all the society participate in and various channels of investment flow to desertification prevention and control.

(3) Promoting implementation of key projects for desertification prevention and control. Since 2007, China has been implementing a series of key ecological projects such as controlling areas of origin of sandstorms affecting Beijing and Tianjin, building forest belts in north, northeast and northwest China, returning cultivated land to forests and grazing land to grasslands, grassland conservation and soil erosion control in small river basins. China has also initiated a number of regional desertification prevention and sand control projects such as those in Talimu Basin and Shiyanghe River Basin (ecological restoration as well) of Xinjiang and building ecological barriers in Tibet. These projects are intended to control key desertified areas and enhance ecological improvements in degraded or desertified lands across the country. The monitoring results show that during the eleventh five-year plan period, the average area of desertification is reduced by 1,717 km^2 annually. The total reduction within five years in areas of severely, medium and extremely severely desertified land is 36,000 km^2, an indication of decreasing desertification level. Soil erosion in some areas has been effectively controlled. The soil erosion modulus is significantly reduced, with annual erosion of yellow sand cut by more than 300 million tons every year.

(4) Enhanced support to capacities for desertification prevention and control. One measure is to enhance scientific and technical capacities. SFA has

established a research institute on desertification to strengthen scientific and technical support in this regard. Some research results such as ‘research on evolution of desertification and models of comprehensive control’, and ‘studies on desertification processes in north China and prevention’ have won national awards for scientific and technological progress. Some research results and applicable techniques are being promoted in wider areas. Another measure is to develop and improve relevant technical standards. A number of technical standards for desertification prevention and control have been developed and issued, such as Technical Guidelines for Desertification Prevention and Control, Technical Guidelines for Monitoring Land Degradation and Desertification and technical standards for controlling areas of origin of sandstorms affecting Beijing and Tianjin. The third measure is to strengthen the monitoring of land degradation and desertification and emergency responses to sandstorms. The fourth national monitoring of land degradation has been completed and a system of emergency responses to major sandstorms has been established. A monitoring system of sandstorms is also in place, with main support from remote-sensing and on-the-ground monitoring, complemented by informers on the ground.

(5) Strengthened inter-sectoral coordination mechanisms for desertification prevention and control. From the central government to local governments, China has established specialized coordination and leading bodies for desertification prevention and control to strengthen the organization, leadership and coordination of desertification prevention and control. Since 2007 various departments have fulfilled their respective responsibilities, creating a mechanism where all relevant departments work together closely and increase synergies while taking care of their own responsibilities.

(6) Implemented a responsibility system for achieving targets for desertification prevention and control. In accordance with requirements contained in the Desertification Prevention and Control Law, during the eleventh five-year plan period, SFA on behalf of the State Council has signed agreements of accountability for achieving the targets for desertification prevention and control with 12 provincial governments of north China and Xinjiang Production Corp. The establishment and implementation of such responsibility system for the first time makes provincial governments accountable for achieving targets for desertification prevention and control, and helps local governments of different levels increase their sense of responsibility for desertification prevention and control, and promote work in this regard across the country. Now agreements of accountability for desertification prevention and control have been signed for the period of 2011-2015.

(7) Encouraging industry development unique to desert areas. To promote industry development unique to desert areas, SFA has developed recommendations for further developing industry in desert areas, which identified the guiding ideology, principles and goals as well as overall layout and priority areas for industry

development in deserts. The recommendations require governments of levels to promote industry development in accordance with local circumstances, to guide various entities to use unique resources in deserts to develop unique industries on the basis of effective protection and control, with a view to improving local farmers' income and promoting economic development in desert areas.

Case 3.5 Soil Conservation Project in Anding District, Dingxi City, Gansu

Anding District, Dingxi City, Gansu Province is located at the Loess Plateau, with the total population of 430,000 and covering an area of 3,638 km^2. The area of soil erosion accounted for more than 90% of its total land area. Relevant departments undertook comprehensive control of soil erosion in this region using a small river basin as a unit and following the ecosystem approach.

(1) Building contiguous terraces in cultivated lands on gentle slopes while abandoning land on steep slopes and planting perennial grass for grazing instead. Grass and trees are planted in those bare mountains and slopes. Water is blocked and soil accumulated by building dams in grooves. Water ponds are built behind houses and beside the fields and barns built in support rills. This kind of system has been called by local farmers as "green caps on top of mountain, belts in the middle of mountains and shoes at the foot of mountains".

(2) Soil erosion in more than 90 small river basins covering an area of more than 1,620 km^2 in this district has been effectively controlled. Those fields with three leaks (of water, soil and fertilizers) have now become fields holding water, soil and fertilizers, with the forest and grass coverage rate increased from the original 8% to 43% currently.

(3) In controlling soil erosion attention was given to using biodiversity to maintain the structure and functions of ecosystems. For example, after slope land has been turned into terraces, potatoes are planted in large areas and agricultural commercialization promoted. The project of collecting rainfall water was implemented, the sites for water accumulation were built covering an area of 3.49 million m^2 and more than 50,000 cellars were dug, providing drinking water for more than 200,000 people and more than 300,000 domesticated animals. The district also developed husbandry with its output values increased significantly from 8.78 million yuan RMB in 1982 to 98.64 million yuan RMB. As a result of the measures above, conditions for agricultural production have substantially improved. In the past decade, the food production of this district has maintained at more than 100,000 tons for years and the people's life has improved and poverty in this district reduced.

Impacts of comprehensive soil conservation in Anding District, Dingxi City, Gansu Province

3.18.2 The United Nations Framework Convention on Climate Change (UNFCCC)

In implementing the UNFCCC, China has fully taken into consideration the interrelationship between climate change, ecosystems and biodiversity, and taken a series of measures to mitigate and adapt to climate change. For mitigation the Government of China has committed to a goal that by 2020 the emission of green-house gases (GHGs) per unit of GDP will be reduced by 40% to 50% over the level of 2005, and a binding target that by 2015 CO_2 emission per unit of GDP will decrease by 17%. To this end, China has undertaken the following main actions:

(1) Adjusting industrial structure and increasing energy efficiency. In 2011 the National Development and Reform Commission revised and issued a guidance list of industrial structure adjustment (2011) to eliminate those projects with high investments, high energy consumption, high pollution and low efficiency, and to encourage those ecological restoration, technological development and infrastructure projects that are environmentally friendly and reuse natural resources comprehensively.

(2) Developing low-carbon energy and improving energy structure. Through policy guidance and investment, efforts are made to enhance coal cleaning, to develop clean energy resources such as coal-bed methane and shale gas, and to support development of renewable energy such as wind, solar, geothermal and biomass power.

(3) Increasing carbon sinks and strengthening ecological conservation. Key ecological projects continue to be implemented, construction of farmland water conservancy facilities and conservation-oriented cultivation strengthened, wetland conservation strengthened, carbons sinks such as forests, grasslands and wetlands increased to further increase their carbon sequestration capacities while conserving biodiversity.

(4) Undertaking pilot and experimental work in low-carbon development. Active efforts are made in pilot work of various forms in developing low-carbon provinces and cities and emission trading to allow for full synergies among climate change adaptation, energy conservation, environmental protection, new energy development and ecological conservation.

In addition to effective control of GHG emissions, the National Twelfth Five-year Plan for Economic and Social Development also required that capacities to adapt to climate change should be strengthened, including adaptation of agriculture, forestry, water resources and other key sectors, and of coastal and ecologically vulnerable areas to climate change. Main actions to this end include:

- Monitoring and assessing responses of ecosystems to climate change, in

particular monitoring and assessing sea level change, sea water invasion, soil salinization and coastal erosion in key regions; promoting development of a system of monitoring and calculation of forest sinks ; undertaking research on forestry adaptation to climate change and undertaking surveys of status of biodiversity and climate change in key regions including the Yellow River Basin, the Pearl River Basin and the Liaohe River Basin.

- Further improving the system of early warning of extreme weather and climatic events, developing a plan for responses to climate disasters and enhancing capacities to respond to extreme climate events in very bad weather conditions.

3.18.3 The Ramsar Convention on Wetland of International Importance Especially as Habitats of Waterfowls

As one of the countries with richest wetland resources in the world, China has established a specialized wetland conservation management body and improved the system of wetland management. As a result areas of wetlands conserved have increased significantly; many important natural wetlands have been rescued and conserved and wetland ecosystems in many regions effectively restored. Main actions include:

(1) Promoting legislation and planning for wetland conservation. China has issued a series of laws and regulations concerning wetland biodiversity conservation, including Forest Law, Wild Animal Protection Law, Water Law, Environmental Protection Law, Marine Environment Protection Law and Fishery Law, all of which are important for conservation and use of wetlands. 17 provinces or autonomous regions have issued provincial regulations on wetland conservation. The State Council has issued the National Plan for Wetland Conservation Projects (2002-2030) and its Project Implementation Plan (2011-2015).

(2) Improving policies for wetland conservation. China has taken various measures to protect wetlands more effectively. The cumulative investment from the central government budget during the 11^{th} five-year plan period was 1.4 billion yuan RMB, with matching investments from local governments exceeding 1.7 billion yuan RMB. A total of 205 demonstration projects for wetland conservation and restoration have been completed, with nearly 800 km^2 of wetlands restored. So far, China has established 577 wetland nature reserves, 468 wetland parks and 46 wetlands of international importance, effectively protecting about 43.5% of wetlands. The conservation system plays a crucial role in maintaining the health of wetland ecosystems.

(3) Laying a solid foundation for wetland conservation. In 2009 a second national survey on wetland resources was undertaken. Using 3S technologies and

following the criteria set by the Ramsar Convention, all the wetlands with area above 8 hectares have been surveyed. The survey covered wetland types, areas, wild flora and fauna in wetlands, wetland management and threats to wetlands. The survey result was launched in January 2014.

(4) Establishing long-term effective mechanisms for ecological compensation and ecological water supply. In 2009 the central government required that pilot work be initiated for ecological compensation for wetlands. Also in 2009 the National Forestry Conference proposed to establish mechanisms of ecological compensation for wetlands. Meanwhile it was required that ecological water use for wetlands be incorporated into water use planning to ensure water supply for wetlands and to allow wetlands to play their ecological functions in underground water replenishment, flood regulation and drought control. This would help wetland ecosystems run into sound cycles. Priority was given to water supply to wetlands of national importance which are threatened with serious water shortages.

Though China has achieved considerably in wetland conservation, with obvious improvements in some wetlands in some regions, overall wetlands across the country are still facing serious threats, such as aridity, water shortage, land reclamation, sand and soil sedimentation, water body pollution and overexploitation of natural resources. The trend of ecological function degradation of wetlands has not been yet contained, and wetlands are still the most vulnerable ecosystem easily subject to encroachment and damage.

3.18.4 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

China strictly implements the decisions of the CITES and its unique mechanism of NDF to ensure that the export of relevant endangered species will not threaten the survival of their wild populations. Meanwhile China cracks down illegal trade in wild flora and fauna. The CITES Office of China together with relevant departments developed a programme of action to implement the decisions of COP 15 of the CITES in which 10 key issues and 6 general issues were identified, with the priorities and direction of implementation identified. These ten key issues include trade in tigers, sharks, ivory, *Saiga tatarica*, rhinoceros, snakes, tropical timber and *Napoleon Wrasse*, import by sea and NDF, and six general issues include labeling of products using crocodiles, sea cucumbers, law enforcement, individual carry-ons and family property, e-trade and coding of sources and uses. In 2011 China established a coordinating group on law enforcement composed of representatives from forestry, agriculture, customs, public security, industry and commerce administration, inspection and quarantine administration to improve the effectiveness of law enforcement and deter crimes. With regard to major timber species and marine species for commercial use, the CITES Office has conveyed to relevant departments the concerns of the CITES and control measures likely to be taken, requesting them to give attention to the conservation of

natural resources for commercial use. In routine work of implementing the CITES, as the CITES Office has established a licensing system for import and export, so the CITES Office together with the customs identified the scope of control by using the list of commodities from endangered wild species for import and export. Besides the mandatory licensing system, administrative licenses and technical measures are also employed for control such as use of a certificate of proof of species, which has proven effective. However due to the fact that the scope of the CITES does not overlap with the CBD requirements, and some unique species have not been included in the scope of the CITES, so control measures for some species are yet to be implemented, in particular those new species or insects not identified and amphibians whose population is small and area of distribution is very limited.

The CITES Office also strengthened cooperation with the CITES Secretariat. In September 2010 the CITES Office and the CITES and CMS Secretariats jointly organized a workshop on conservation and sustainable use of Saiga gazelles in Uyghur, Xinjiang. The workshop invited conservation and management bodies from Kazakhstan, Russia, Uzbekistan and Mongolia. Relevant stakeholders in China such as Chinese Medicine Association were also invited to discuss with these country representatives to increase synergies in implementation of MEAs and involve key stakeholders in conservation and urge them to follow sectoral sustainable development strategies. In April and May 2011 the CITES Office and the CITES Secretariat organized workshops in Guangzhou respectively on snake management in Asia and development of e-licenses for endangered species, discussing about emerging issues for the implementation of the CITES.

China has also undertaken cooperation and exchanges with relevant Parties. China and USA have streamlined management of trade in turtles and developed policies for zero trade in wild species, promoting monitoring and replenishment of wild turtles, and promoting farming to nurture wild populations, based on the current situation of critical endangerment of wild species. These policies have been recognized by COP 16 of the CITES. In September 2012 the Government of China organized a training workshop for African countries, with very good results achieved. China has also strengthened cooperation with African countries. China has further strengthened cooperation with Russia, India, Mongolia, Vietnam, Lao DPR, Indonesia and Thailand in law enforcement and the implementation of the CITES.

Part IV. Progress in Implementation of 2020 Biodiversity Targets and Contributions to Millennium Development Goals

4.1 Indicators for Assessing Progress Towards 2020 Biodiversity Targets

The indicator system for assessing the 2020 biodiversity targets was developed by using the pressure-state-benefit-response framework. In developing these indicators, the principles below were followed:

- Representing various aspects of biodiversity;
- Reflecting truly and timely changes in the status of biodiversity;
- Easily understood by decision makers, the public and managers, and recognized widely;
- Providing accurate measurement, while minimizing costs of data collection and using existing data as much as possible;
- Reflecting changes resulting from policy implementation.

The indicator system contains 17 Class A indicators and 42 Class B indicators (see details in Table 4.1).

Table 4.1 Indicators for Assessing China's Progress towards 2020 Biodiversity Targets

Class A Indicators	Class B Indicators and annotations
Biodiversity Status	
1. Macro-structure of ecosystems	(1)This refers to changes in the area and percentage of ecosystems such as forests, grasslands, wetlands and deserts. Remote-sensing data can be used for calculation. Separate analysis undertaken of areas of natural forests. Natural forests refer to forests naturally formed and naturally regenerated or grown through artificial enhancements.
2. Health condition of ecosystems	(2) Living wood growing stock: refers to the totality of stock volume of all living wood grown on land in a certain region. Natural forest growing stock can be also used. It can be calculated using forest consensus data. (3)Annual net primary productivity of forest ecosystems: refers to the remaining part after autotrophic respiration is deducted from the total amount of organic materials generated by photosynthesis of green plants within a unit of time and land area. As a key variable of characterization of vegetation activity, it can play an important role in global carbon balance. It can be calculated using data from remote sensing. (4) Total output of fresh grass from natural grasslands. Data from grassland monitoring provided by the Ministry of Agriculture can be used. (5) Marine trophic index: refers to the average nutrition level of marine catches, reflecting the length of marine food chain, and also integrity and resistance to disturbances of marine ecosystems. FAO data can be used.
3. Species diversity	(6) Red List Index: refers to changes in level of endangerment and populations of endangered species, and also indicates overall change in endangerment level of certain species. Relevant species can be assessed

	separately. (7) Population of endemic fish species in inland waters, which can reflect changes in inland water fish diversity. Data from the Institute of Aquatic Biology of CAS can be used for calculation.
4. Genetic resources	(8) Local varieties and breeds, which can reflect the situation of protection of traditional genetic resources.
Ecosystem services	
5. Services provided by ecosystems	(9)Supply of goods: goods or services provided by ecosystems that human beings can exchange in markets, mainly including foods, husbandry products, wood and fresh water resources. Data from remote sensing can be used for calculation. (10) Regulating function: regulating water sources, fixing sand, and conserving soil. Remote sensing data can be used for calculation. (11)Supporting function: ecosystems should provide habitats for wild animals and plants, and ensure their reproduction and survival. Remote-sensing data can be used for calculation.
6. Changes in community health and well-being that depends directly on goods and services provided by local ecosystems	(12) Net income per capita of rural households (13) Number of people in poverty Data from the State Statistics Bureau and the monitoring of key ecological projects by the State Forestry Administration can be used.
Pressures	
7. Environmental pollution	(14)Annual emissions of COD from industrial waste water, SO_2 and soot from effluent gas, and industrial solid wastes etc., which can indicate level of threat to biodiversity from environmental pollution. Data from environmental statistics can be used. (15)Intensity of pollutant discharging per unit of GDP: amount of pollutant discharging per unit of GDP. Data from environmental statistics can be used. (16)Intensity of CO_2 emission per unit of GDP: amount of CO_2 emission per unit of GDP. Data from relevant statistics can be used. (17)Amount of use of agricultural chemicals: indicating impacts of agricultural activities on biodiversity. High nitrogen input and nitrogen imbalance will pose serious threat to biodiversity. Data from agricultural statistics can be used. (18)Amount of use of agricultural chemicals per unit of value added from agriculture. Data from agricultural statistics can be used.
8. Climate change impacts on biodiversity	(19)Refers to impacts of climate change on the structure and function of ecosystems, and on distribution and growth of species and genetic resources.
9. Level of damage caused by invasive alien species	(20)Number of invasive alien species newly found in every two decades. Data from relevant surveys can be used. (21)Number and frequency of harmful species intercepted by customs and port authorities. Data from customs and port authorities can be used.
Responses	

10. System of *in-situ* conservation	(22)Number and area covered by nature reserves: coverage rate refers to percentage of nature reserves out of total land area of the country, that can reflect the *in-situ* biodiversity conservation status. Data from environmental statistics can be used. (23)Number and area of community-based conservation areas. Data from SFA can be used. (24)Number and area of scenic spots. Data from the Ministry of Housing, Urban and Rural Construction can be used. (25)Number and area of forest parks. Data from SFA can be used. (26) Number and area of wetland parks. Statistics from SFA can be used. (27) Number and area of national-level germplasm conservation areas. Statistics from MOA can be used. (28) Number and area of special marine protected areas. Data from SOA can be used.
11. Implementation of policies and programmes	(29)Implementation of national key ecological projects, number of provincial BSAPs launched.
12. Conservation and restoration of habitats	(30)Forest growing stock in key ecological project regions. (31)Timber output from key ecological project regions, indicating adjustments in timber outputs. (32) Soil erosion in key ecological project regions. Data from monitoring of key ecological projects provided by SFA can be used for the indicators above.
13. Pollution control	(33)Capacity of flue-gas desulfurization (FGD) units installed and their percentage out of total thermal power facilities. (34)Municipal wastewater treatment capacities. (35)Solid waste disposal. Data from environmental statistics can be used for the indicators above.
14. Comprehensive reuse of resources	(36)Amount of use of renewable resources: number of solar water heaters, solar stoves. (37) Annual output of projects disposing of agricultural wastes. (38) Total capacities of ponds disposing of agricultural wastes. (39)Total capacities of biogas ponds disposing of wastewater at village level. Data from agricultural statistics can be used for the above indicators.
15. Public awareness	(40) Items about China's biodiversity that can be searched through Google or Baidu in different years.
16. Knowledge of conservation and sustainable use of biodiversity	(41) Number of academic papers on biodiversity conservation. Data from relevant literature can be used for calculation.
17. Biodiversity investment	(42) Investments into projects such as those on natural forest resources protection, conservation of wild animals and plants, establishment of nature reserves and wetland conservation. Data from SFA statistics can be used.

Note: Class B indicators underlined are new indicators used in this report compared with those used in the fourth national report. Relevance of these indicators to the 2020 targets is provided in the table contained in Annex 2.

4.2 Data Analysis of Indicators for Assessing the 2020 Biodiversity Targets

4.2.1 Biodiversity status

(1) Marco-structure of ecosystems

According to the result from the Project of Remote-sensing Survey and Assessment of National Ecological Changes in the Decade from 2000 to 2010, during the decade from 2000 to 2010, the areas of forests, wetlands and urban ecosystems have increased slightly while those of shrubs, grasslands, deserts and agricultural ecosystems have decreased. The area of forests increased by 20,000 km^2, that of wetlands by 2,500 km^2, and that of urban ecosystems by 56,000 km^2. The areas of shrubs and grasslands dropped respectively by about 12,000 km^2 and 17,000 km^2, and those of deserts and agricultural ecosystems respectively by 4,500 km^2 and 42,000 km^2 (Figure 4.1). Drastic changes have occurred in the layout of ecosystems in some regions where urbanization, agricultural expansion and the concentrated areas of returning cultivated land to forests took place. Since the 1980's, the area of natural forests in China has constantly increased (Figure 4.2).

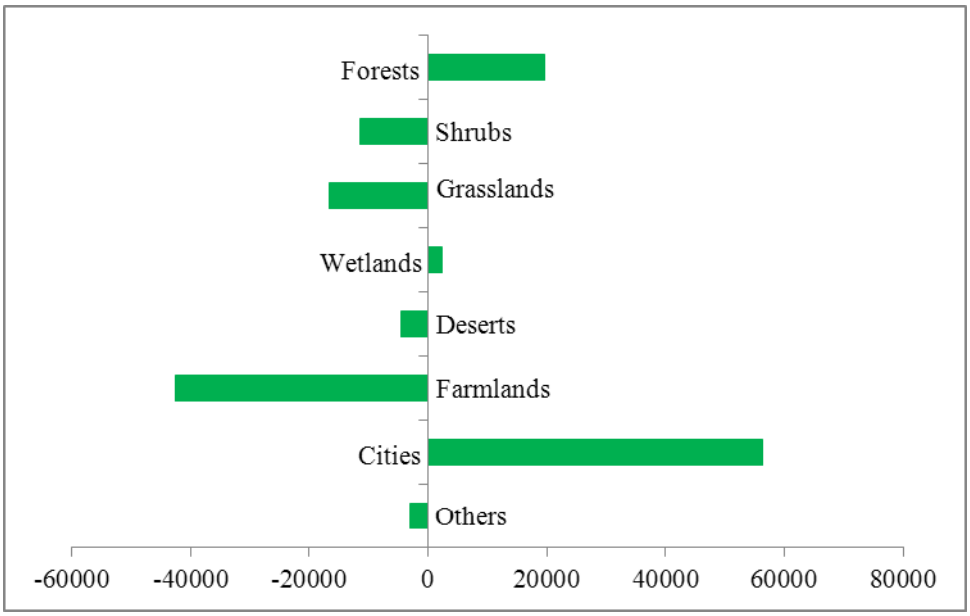


Figure 4.1 Net changes in areas of terrestrial ecosystems in China during 2000-2010 (km^2)

Source: the Project of Remote-sensing Survey and Assessment of National Ecological Changes in the Decade from 2000 to 2010, Courtesy of Ouyang et al.

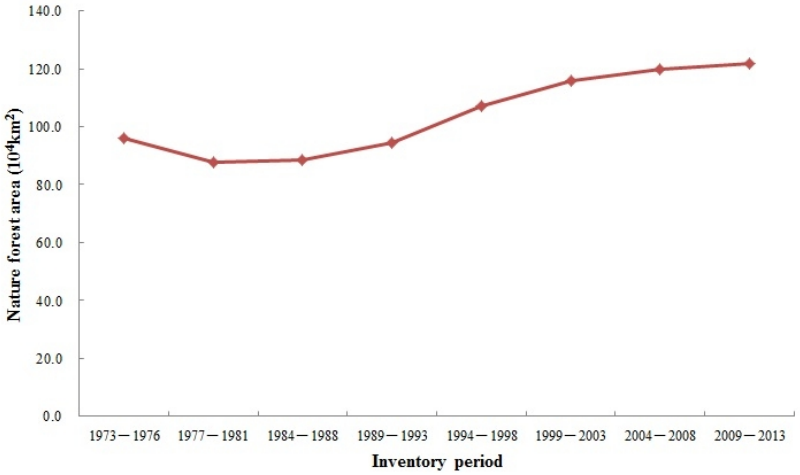


Figure 4.2 Changes in Areas of Natural Forests in China in Different Periods of Time
Source: China's Yearbook of Forestry Statistics

(2) Ecosystem health conditions

China's forest growing stock has been increasing constantly since the 1980's. If compared with the result of the sixth consensus, the seventh consensus shows that China's total living wood growing stock has a net increase of 1.13 billion m^3, and forest growing stock has a net increase of 1.12 billion m^3, and natural forest growing stock has a net increase of 680 million m^3 (Figure 4.3). During 2000-2010, overall China's annual net primary productivity of forests has been going up (Figure 4.4). Despite the constant increase in the total amount of forest reserves and the recovery of some functions of forest ecosystems, there is still an issue of the inadequate total amount, low quality and imbalanced distribution of forest resources.

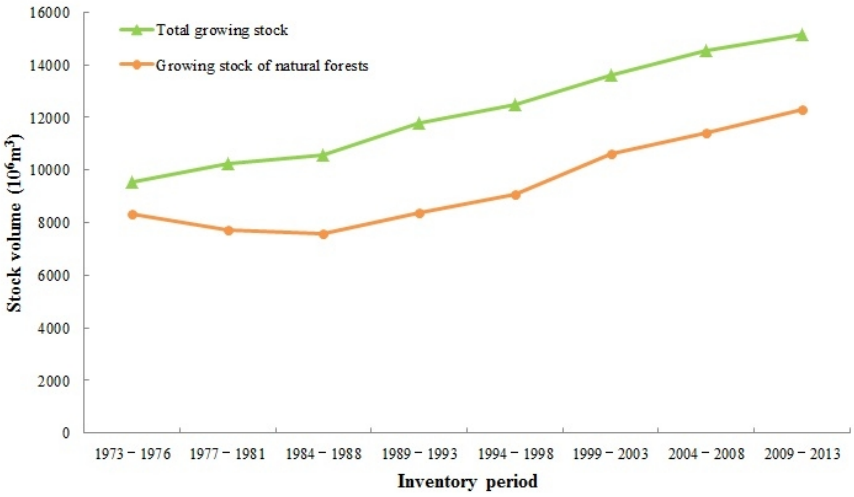


Figure 4.3 Changes in Forest Growing Stock in China in Different Periods of Time
Source: China's Yearbook of Forestry Statistics

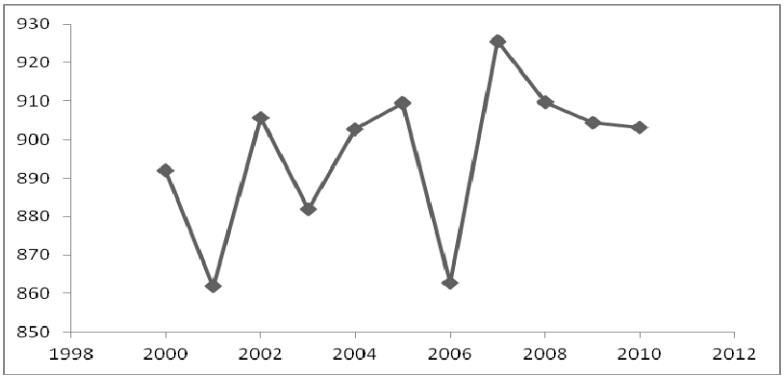


Figure 4.4 China's Annual Net Primary Productivity of Forest Ecosystems（NPP, gC/m^2） Source: Project of Remote-sensing Survey and Assessment of National Ecological Changes in the Decade from 2000 to 2010, Courtesy of Ouyang et al.

Positive changes have taken place in grassland ecosystem as a result of constant efforts in conservation and restoration of grassland ecosystems. From 2005 to 2102, the total national output of fresh grass from natural grasslands across the country has been going up (see Figure 4.5). This indicates that part of the grassland ecosystem is improving. However most parts of the grassland are still being grazed beyond their capacities. Degradation, desertification, salinization and rockiness of grasslands are still very severe and overall ecological conditions of grasslands are serious.

China's marine trophic index (MTI) has been declining due to overfishing from the early 1980's to the middle 1990's, lower than the world's average of the same period. This revealed serious degradation of marine ecosystems. From 1997 to now China's MTI has started to climb up (see Figure 4.6), probably due to a positive impact from implementation of summer fishing bans for replenishment of marine fishery resources. However China's MTI is still at a relatively low level, with low ecological functions, and challenges remain high for marine biodiversity conservation.

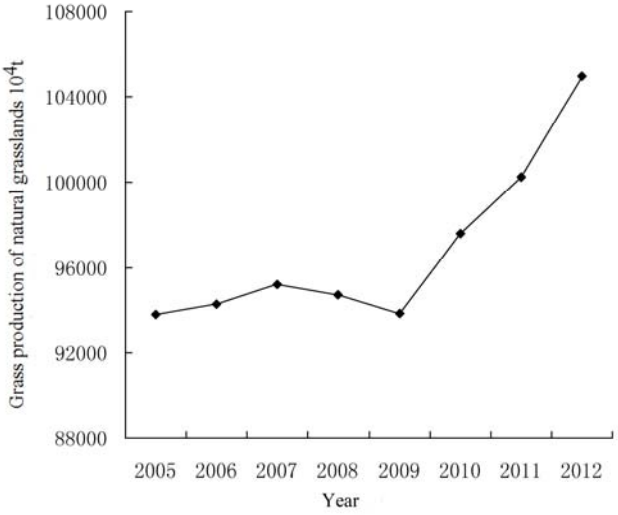


Figure 4.5 Total National Output of Fresh Grass from Natural Grasslands
Source: National Report on Grassland Monitoring

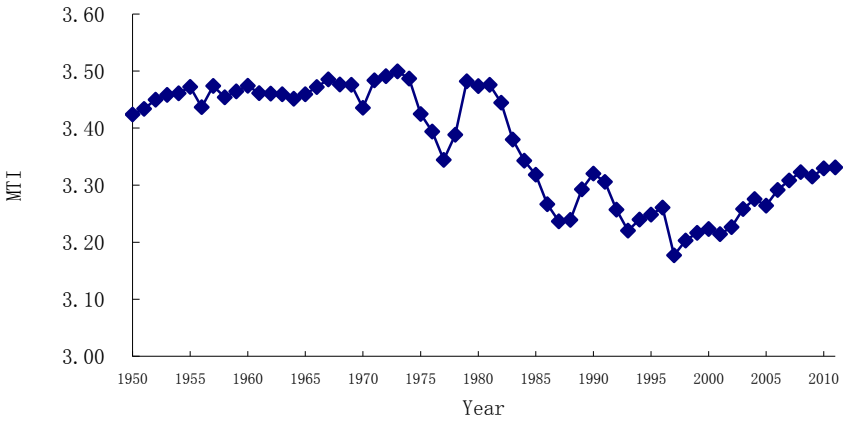


Figure 4.6 Changes in Marine Trophic Index in Marine Waters of China

(3) Species diversity

Red List Index (RLI) refers to total changes in Red List Categories of certain taxa. When RLI is zero it means that all species are extinct; and when RLI is ONE it means that none of the species are threatened and no need to protect them. From 1998 to 2004, the RLI of China's fresh water fishes was declining. From 1996 to 2008, the RLI of China's mammals was going down. From 1988 to 2012, the RLI of birds went down slightly according to the Equal-steps calculation method, however it went up slightly initially and then turned downward again according to the Extinction-risk calculation method (Figure 4.7). Due to habitat degradation and loss, the threatened status of mammals and fishes has been increasing. Overall, the threatened status of birds as whole is increasing though there are some improvements to some extent in the status of critically endangered species.

China has been monitoring some inland water fishes. From 1997 to 2009 the populations of endemic fishes in the upper reaches of the Yangtse River went down (Liu and Gao，2012) (Figure 4.8), indicating that biodiversity in the Yangtse River Basin is still declining.

(4) Genetic Resources

It is estimated that loss of China's genetic resources is very serious. However, due to availability of limited data, individual cases can be used to illustrate this. For example, China's main agricultural crops are rice, wheat and maize. In the 1950's the varieties of rice grown in different parts of China were more than 46,000, however by 2006 this number went down to slightly over 1,000, with most of them being cultivated varieties. The local varieties of maize grown in the 1950's exceeded 10,000 however the varieties being grown now are no longer local varieties. Similarly, the wheat varieties grown in the early 1950's came up to 4,000 or so however in 2000 this number dropped under 400 or so, most of which are cultivated varieties. According to the result of a second national survey on livestock genetic resources, 15 local breeds of livestock cannot be found any more and the populations of more than a half of local breeds are going down (National Committee on Livestock Genetic Resources, 2011).

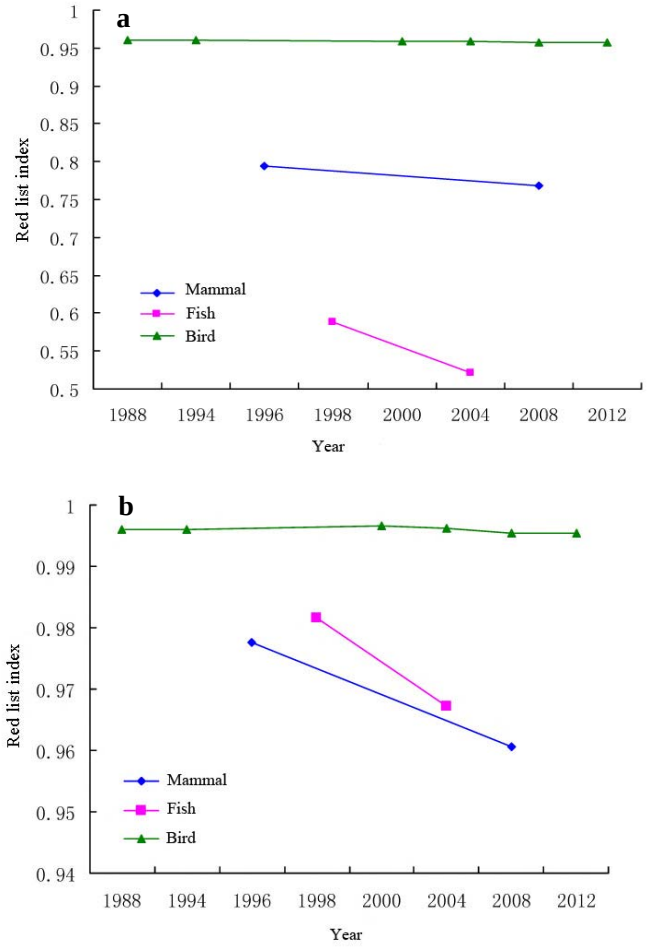


Figure 4.7 Red List Index of China's Vertebrate Species

(a) Equal-steps method; **(b)** Extinction-risk method.

Source: Birds from Birdlife International, http://www.birdlife.org/, n=1208; mammals from IUCN Red List Database: http://www.iucnredlist.org/, n=99; fishes from China's Red Data Book on Endangered Animals and China's Species Red List, n=81.

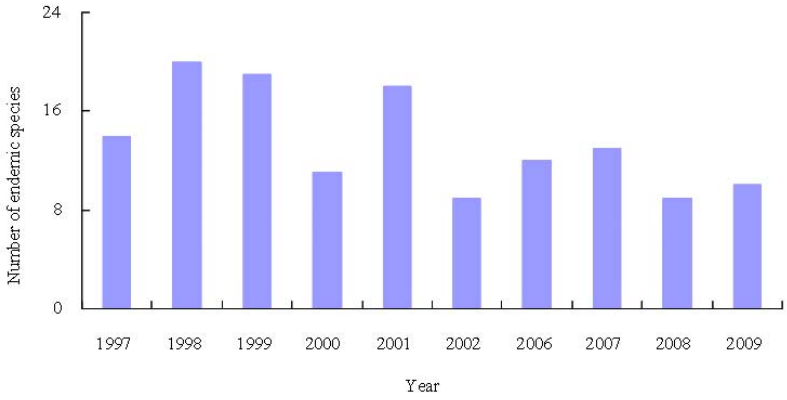


Figure 4.8 Population of Endemic Fishes of the Upper Reaches of the Yangtse River (Mutong River Section). Source: Liu and Gao, 2012.

4.2.2 Ecosystem services

(1) Services provided by ecosystems

In accordance with the result of the Project of Remote-sensing Survey and Assessment of Ecological Changes in the Decade from 2000 to 2010, the provision of products from China's terrestrial ecosystems during this decade such as food, husbandry products, timber and fresh water resources has been constantly increasing, from 2,018.4 trillion kcal to 2,805.2 trillion kcal, an increase by 39% within a decade.

In terms of the regulating function of ecosystems, the water regulating functions of China's terrestrial ecosystems increased from 351.3×10^{10} m^3 in 2000 to 352.9×10^{10} m^3, an increase of 0.5% within a decade. The functions of windbreak and sand control increased from 171.5×10^8 t in 2000 to 182.5×10^8 t in 2010, an increase by 6.4% within a decade. Soil holdings increased from 2495.1×10^8 t to 2509.1×10^8 t in 2010, an increase of 0.6% within a decade.

With regard to the supporting functions of ecosystems, the habitat quality index is used to assess changes within a decade in the supporting functions of biodiversity. From 2000 to 2010, the area of ecosystems with low-quality habitats took a bigger percentage, while the area of ecosystems with high or relatively high quality habitats went down constantly (Figure 4.9). This indicates that despite key ecological projects implemented in China, the supporting functions of biodiversity are still going down as the improvement of habitat quality is a gradual and long process.

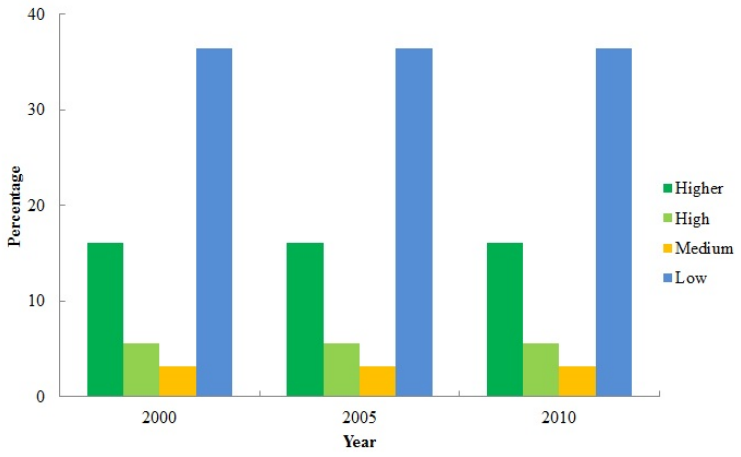


Figure 4.9 Supporting Functions of Biodiversity of China's Terrestrial Ecosystems
Source: Project of Remote-sensing Survey and Assessment of Ecological Changes in the Decade 2000-2010, courtesy of Ouyang et al.

(2) Changes in health and well-being of communities that directly depend on products and services provided by local ecosystems

The net income per capita of rural households in China rose quickly, an increase by 40.8% in 2011 over that of 2000. This in part benefited from an increase in the provision of ecosystem goods and services (Figure 4.10). For poverty reduction, using the data from the projects on natural forest resources protection and returning cultivated lands to forests as an example, the number of poor people in those sample counties where these projects have been implemented is going down. The number of poor people in those counties where natural forest resources protection projects were implemented has dropped from 3.95 million in 1997 to 1.18 million in 2011, and the number of poor people in those counties where projects on returning farmlands to forests were implemented down from 8.3 million in 1998 to 5.7 million in 2008 (Figure 4.11). While conserving and restoring forest ecosystems, these projects also result in improvement of well-beings of local communities that directly depend on local ecosystem goods and services.

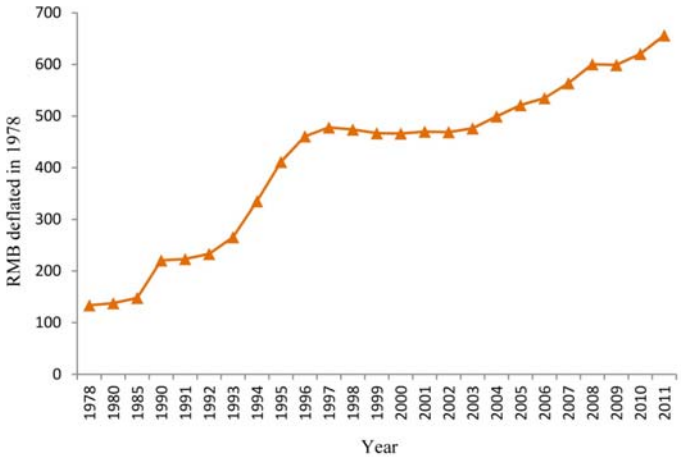


Figure 4.10 Per Capita Annual Net Income of China's Rural Households (RMB Deflated in 1978)**.** Source: China Statistics Yearbook

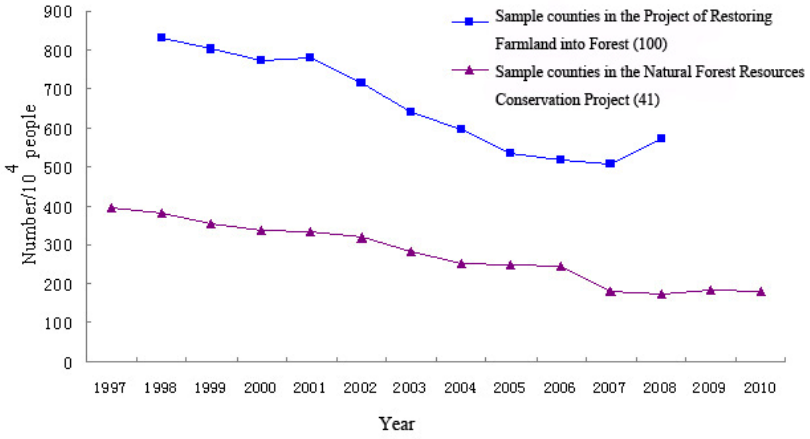


Figure 4.11 Poor Population in Sample Counties where Natural Forest Resources Protection and Returning-farmlands-to-forests Projects were implemented. Source: National Report on Monitoring of Social and Economic Benefits from Key Forestry Projects

4.2.3 Pressures

(1) Environmental pollution

Since 2006, the emissions of COD in industrial waste water, SO_2 in effluent gas, soot, industrial dust and solid wastes have been going down (Figure 4.12). Despite high-rate economic growth in the past decade, the amount of pollutant discharged per unit of GDP decreased by more than 55% (Figure 4.13). Since 2004, the CO_2 emission amount per unit of GDP dropped by 15.2% (Figure 4.14). From 1991 to 2011, the amount of use of agricultural chemicals more than doubled (Figure 4.15), however after 2003, the amount of use of agricultural chemicals per unit of agricultural added value decreased constantly (Figure 4.16), indicating that the efficiency of use of agricultural chemicals is increasing.

The discharging of waste water is still increasing, and the amount of discharge of pollutants per unit of GDP remains to be at high level. The surface water is lightly contaminated overall. The percentage of river sections with water quality lower than Grade V in the Yangtse River, the Yellow River, the Pearl River, some rivers in Fujian and Zhejiang Provinces and rivers in southwest China is still up to 10.2%. Among 60 lakes (reservoirs) being monitored, 25% of them are in the state of eutrophication. The overall state of the environment of the marine areas under China's jurisdiction is good, however the water pollution of coastal and near-shore marine areas is still very serious. In a word, environmental pollution is posing severe threats to biodiversity.

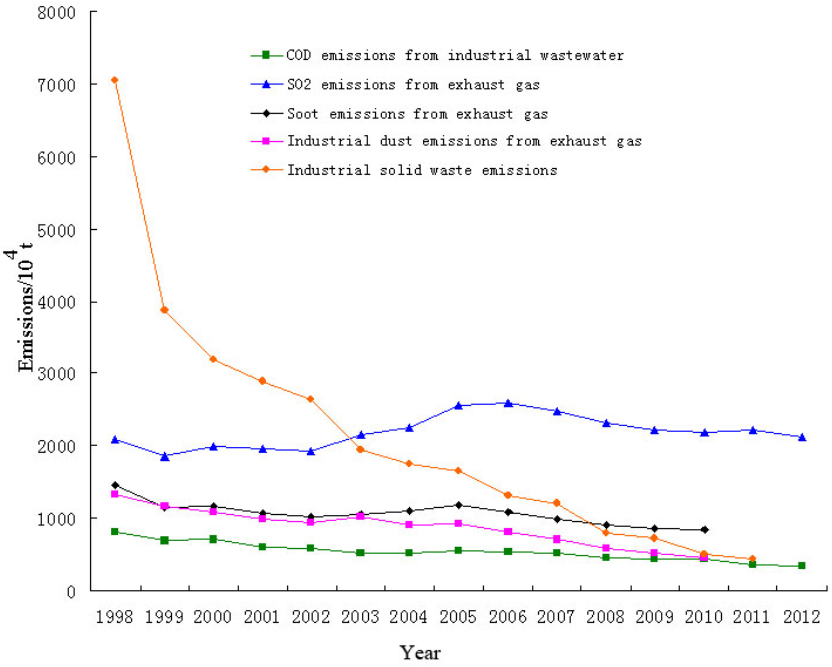


Figure 4.12 Annual amount of emission of COD from industrial wastewater, SO_2, soot and dust from effluent gases and industrial solid wastes. Source: National Environmental Statistics Gazette and China Environmental Statistics Yearbook

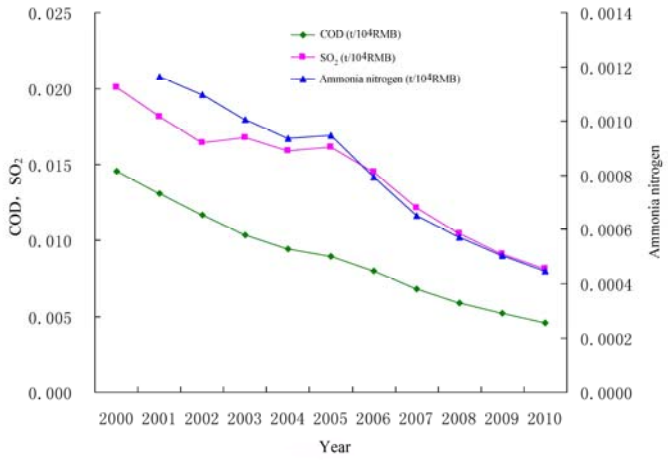


Figure 4.13 Changes in Amount of Emission of Pollutants per unit of GDP. Source: China Environmental Statistics Yearbook and China Statistics Yearbook

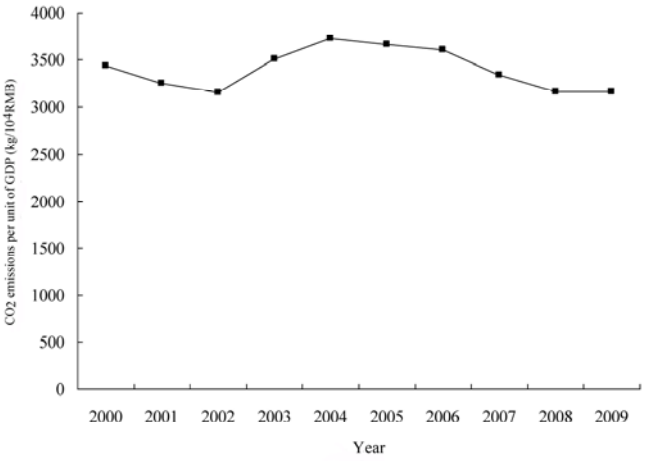


Figure 4.14 Changes in CO_2 Emission per unit of GDP
Source: China Environmental Statistics Yearbook and China Statistics Yearbook

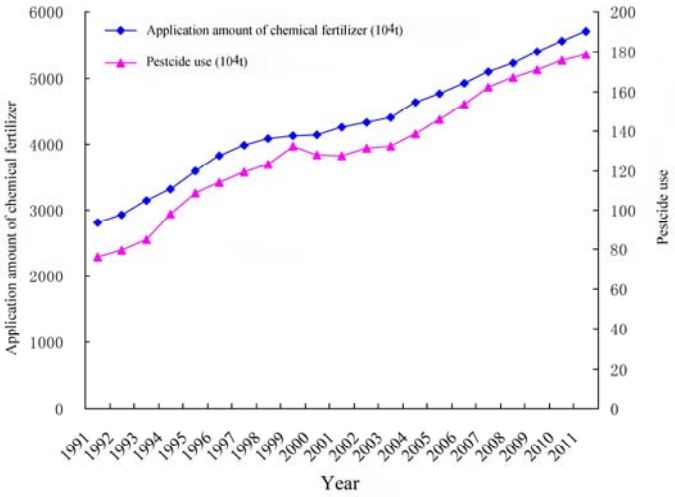


Figure 4.15 Amount of Use of Agricultural Chemicals. Source: China Agricultural Statistics Material

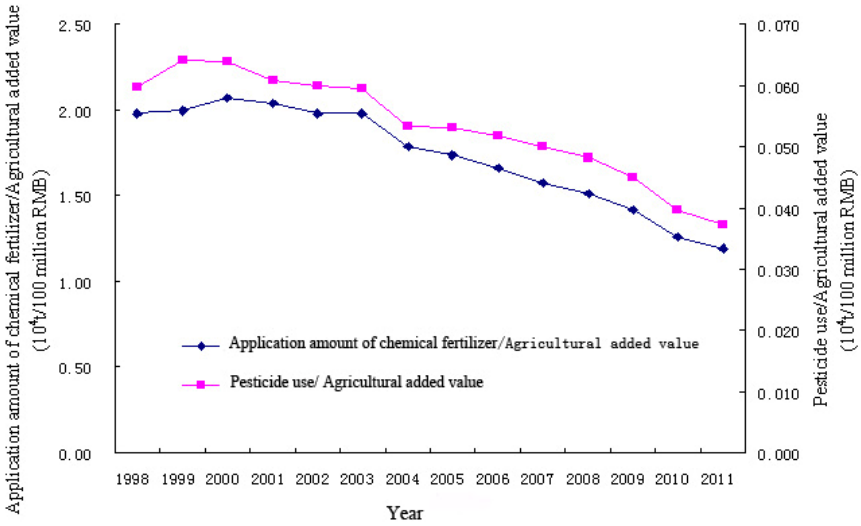


Figure 4.16 Amount of Use of Agricultural Chemicals per unit of agricultural value added. Agricultural value added is adjusted by using CI, with baseline year being 1978. Source: China Statistics Yearbook 2012.

(2) Climate change

From 1951 to 2009, the average temperature of land surface in China rose by 1.38 ^{0}C, with the warming rate being 0.23/10a. Climate change has had recognizable impacts on China's ecosystems and species. Climate change has aggravated grassland degradation and decreased functions of inland wetlands (Second National Report of Assessment of Climate Change, 2011). In the past several decades, climate warming and drying trend in Hulun Lake region is obvious, with lake area shrinking, grasslands around the lake degraded, land desertified and vegetation coverage decreasing, posing major threats to species living in these habitats (Zhao et al, 2008).

Climate change has also modified the phenology, distribution and migration of species. The spring phenology (initial flowering and leafing periods) of woody plants in northeast and north China and the lower reaches of the Yangtse River has advanced, while the phenology of woody plants in the regions south of Qinling Mountain including the eastern part of southwest China and the middle reaches of the Yangtse River has been postponed (Zheng et al, 2003). Since 1980, the natural phenology of some birds such as *Cuculus canorus* in Qinghai (Qi et al, 2008) and *Cuculus micropterus* in southwest Shandong (Zhang et al, 2011) has advanced, with initial bird singing advanced and final bird singing delayed. Climate change also caused elevation of timberline latitude in some regions. Due to climate warming, the areas of distribution of 120 birds have shifted northward or westward. Climate change has made the original habitats of some species disappear. The warming climate trend in Qinghai Lake region plus impacts from human activities in this region have led to changes in the composition of species in this region, in particular major changes in the composition of bird species. Compared with the 1950's, 26 bird species such as bean goose, gray-headed thrush, Marsh Harrier and quail have disappeared from the lake

region (Ma & Jiang, 2006).

Climate change expands the scope of distribution of pests and aggravates their damages. For example climate warming has expanded the scope of distribution of *Solidago canadensis* (Wu and Liu, 2008) and *Dendrolinus punctatus* (Forest Pest Prevention and Control Station, SFA, 2013).

(3) Invasive alien species

The distribution of invasive alien species in China is generally divided into three levels, mostly in coastal provinces and gradually less in inland provinces. Most of IASs are found in coastal provinces and Yunnan Province, followed by central China regions and neighboring provinces in eastern and western China (Figure 4.17). Analysis of invasive alien species with records of time of invasion has indicated that the number of new IAS is gradually going up. Sixty years after the 1950's, 212 new IASs entered China, accounting for 53.5% of the total IASs (Figure 4.18).

With the deepening of opening to the outside and high-rate growth of international trade, plant pests intercepted by customs and port authorities have increased substantially. The varieties of pests intercepted in 2012 were 18.9 times as many as those in 1999, and the frequency was even 230.2 times higher (Figure 4.19). This posed serious threats to agriculture, forestry and ecological security.

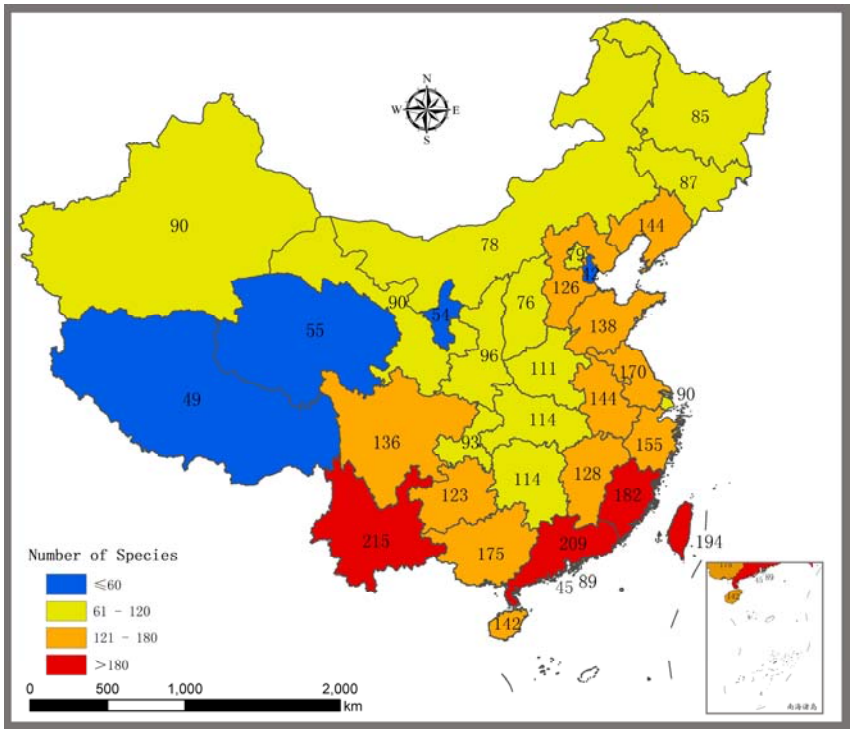


Figure 4.17 Distribution and Number of IASs. (Xu & Qiang, 2011)

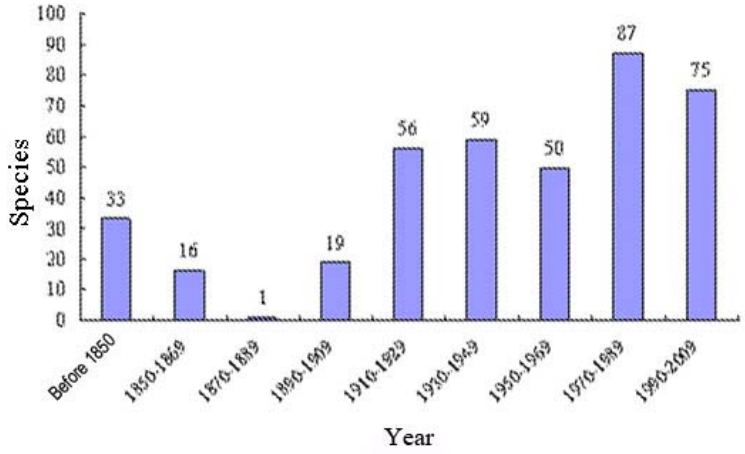


Figure 4.18 Number of Newly-Identified IASs Every Two Decades. (Xu & Qiang, 2011)

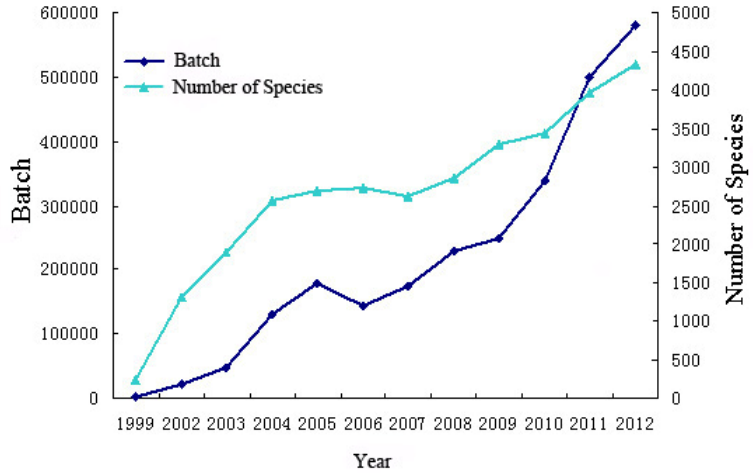


Figure 4.19 Frequency and Varieties of Pests Intercepted by Customs and Port Authorities. Source: website of State Administration of Quality Supervision, Inspection and Quarantine **(**www.aqsiq.gov.cn)

4.2.4 Responses

(1) *In-situ* conservation system

In recent years, the number and area of nature reserves in China has been maintained stable (Figure 4.20), with the total areas of nature reserves accounting for 14.8% of the total land area of the country. A network of nature reserves with different types, reasonable layout and relatively sound functions has been basically established. However, their ecological representativeness and management effectiveness need to be improved and more work is needed to improve research and ecological compensation. The number and area of national scenic spots have also increased (Figure 4.21), and shifts are being made from more attention given to protection of scenic landscapes to more integrated protection of scenic landscapes, cultural heritages and biodiversity. However destruction of scenic spots can be still seen in

some regions. The number and area of forest parks have also increased quickly (Figure 4.22), with a system in place for conservation and use of forest scenic resources. However a lot of rare forest scenic resources have not been effectively protected, and some such resources have been even destroyed in some regions. The number of community-based forestry conservation areas across the country is maintained, however the area is going down constantly (Figure 4.23). The number and area of national-level aquatic germplasm conservation areas and special marine protected areas have been constantly increasing (Figures 4.24 and 4.25).

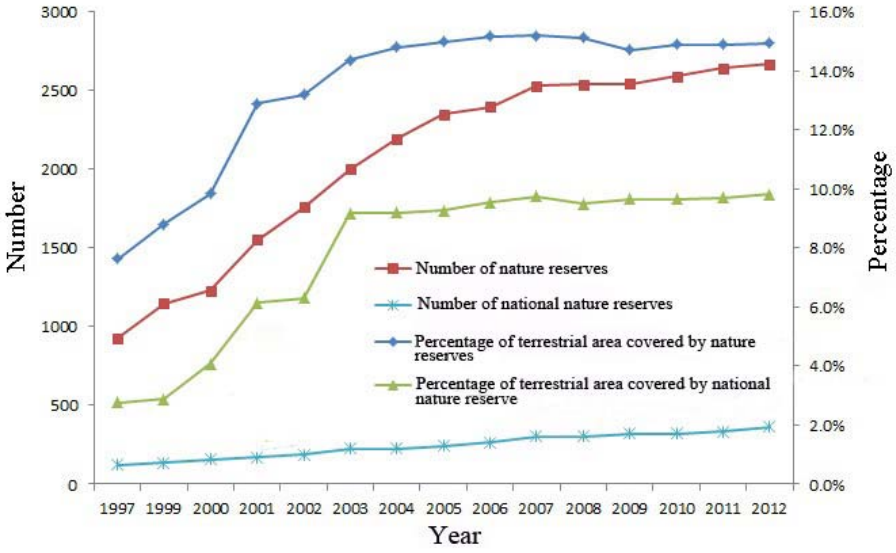


Figure 4.20 Number of Nature Reserves and Percentage of Areas. Source: China Report on the State of the Environment, China Environmental Statistics Yearbook

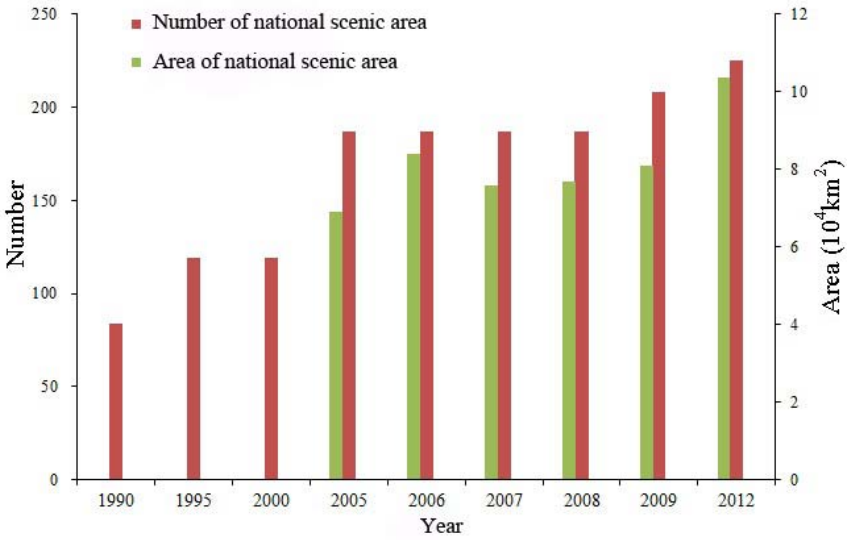


Figure 4.21 Number and Area of National Scenic Areas. Source: China Communiqué on Development of Scenic Areas

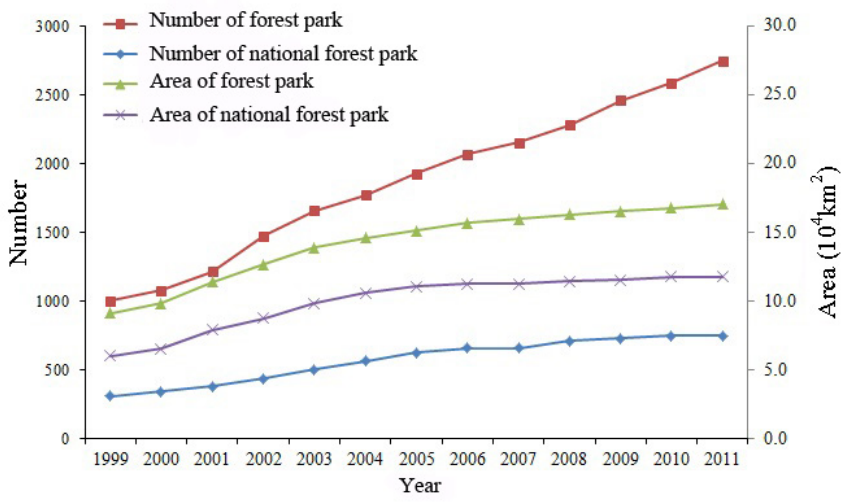


Figure 4.22 Number and Area of Forest Parks. Source: China Forestry Statistics Yearbook

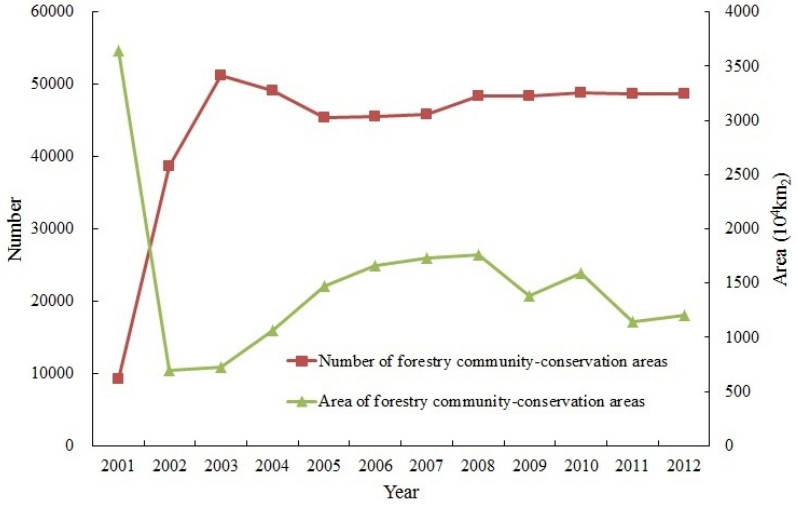


Figure 4.23 Number and Area of Forestry Community-Conservation Areas. Source: China Forestry Statistics Yearbook

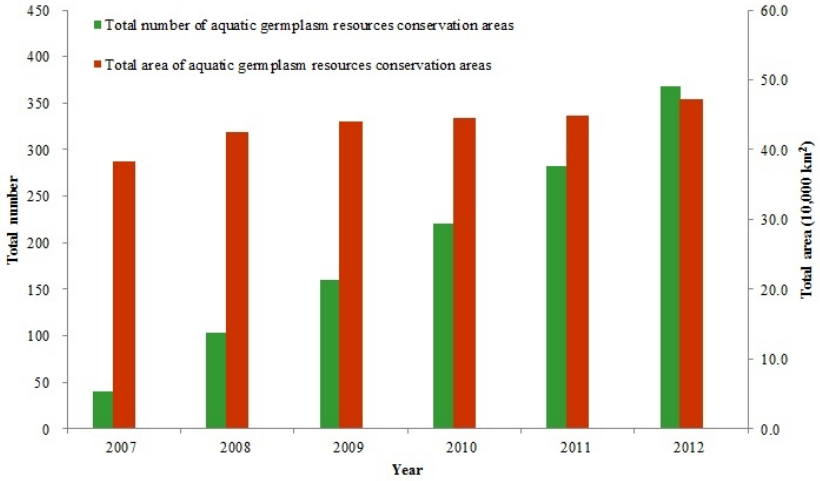


Figure 4.24 Number and area of national aquatic germplasm conservation areas. Source: Ministry of Agriculture

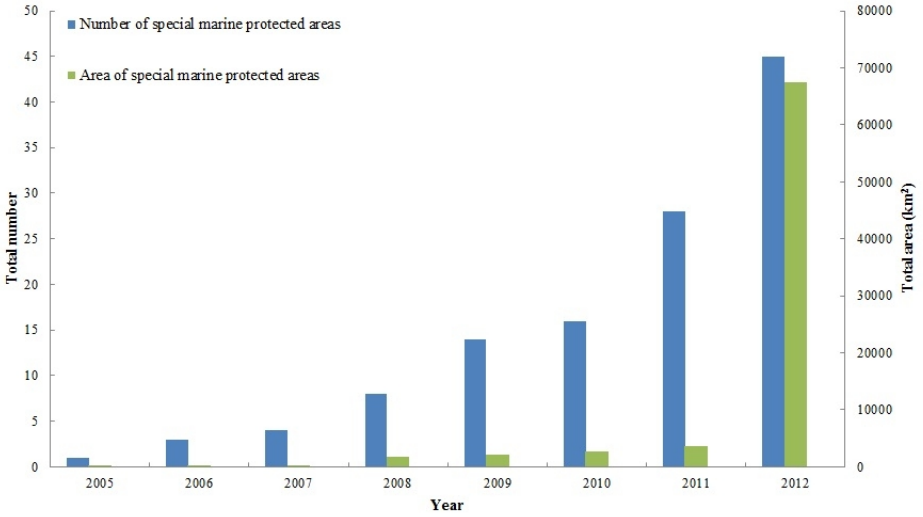


Figure 4.25 Number and area of special marine protected areas. Source: State Oceanic Administration

(2) Implementation of policies, plans and programmes

China has implemented a series of policies, plans and programmes favorable for biodiversity. China has been implementing a number of major ecological projects such as natural forest resources protection, returning farmlands to forests, returning grazing lands to grasslands, construction of forest belts in north, northeast and northwest China, wetland protection and restoration and soil conservation. The implementation of these projects has enhanced the restoration of degraded ecosystems and habitats for wild species and effectively protected biodiversity. All the provinces (autonomous regions, province-level municipalities) are developing their biodiversity strategies and action plans. So far 7 provinces have launched their BSAPs.

(3) Habitat protection and restoration

Since 2001, China has made great achievements in key forestry projects, with good results achieved for forest conservation and restoration. Forest reserves in sample counties and enterprises where major ecological projects have been implemented have been going up since 1999 (Figures 4.26 & 4.27). Timber outputs from sample enterprises where natural forest resources projects were implemented have been declining constantly, from 6.243 million m^3 in 1997 to 1.795 million m^3 (Figure 4.28), indicating that adjustments in timber outputs had remarkable achievements. The areas affected by soil erosion in these sample counties are going down overall (Figure 4.29). In sum, these key forestry projects have played a critical role in ecological conservation.

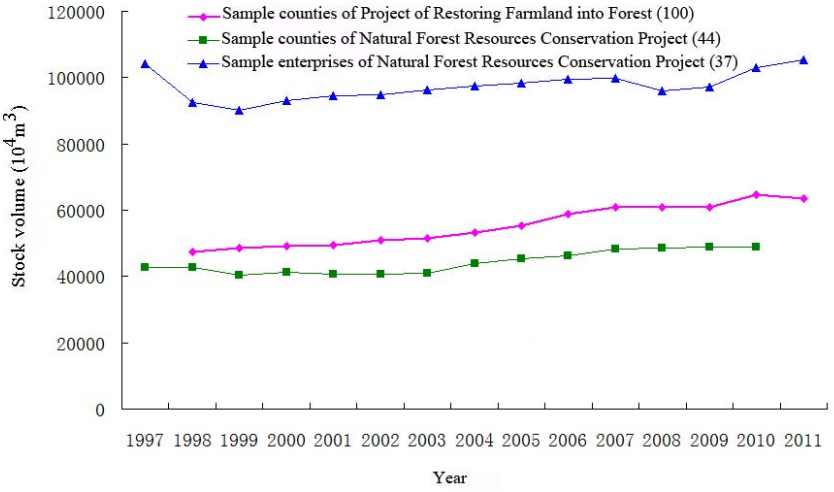


Figure 4.26 Forest reserves of sample counties and enterprises where natural forest resources protection projects and returning-farmlands-to-forest projects were implemented. Data in the figure are sample data. Source: National Report on Monitoring of Social and Economic Benefits from Key Forestry Projects

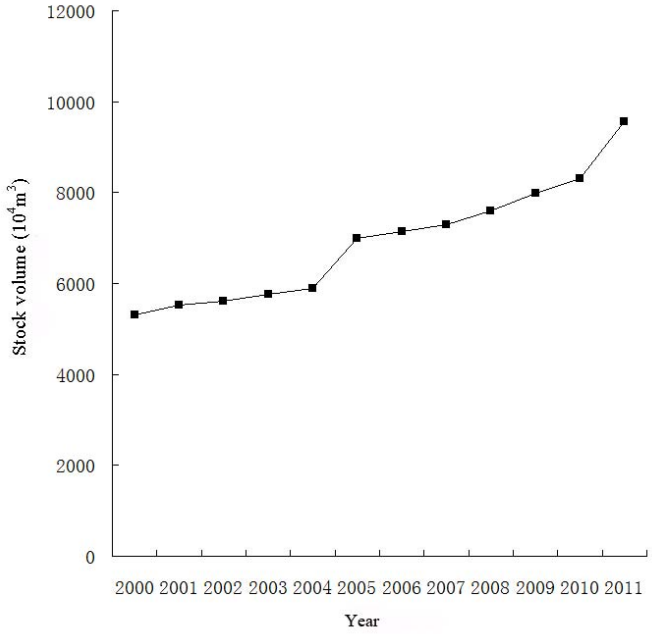


Figure 4.27 Forest reserves of sample counties where projects to control origins of sandstorms affecting Beijing and Tianjin were implemented. Source: National Report on Monitoring of Social and Economic Benefits from Key Forestry Projects

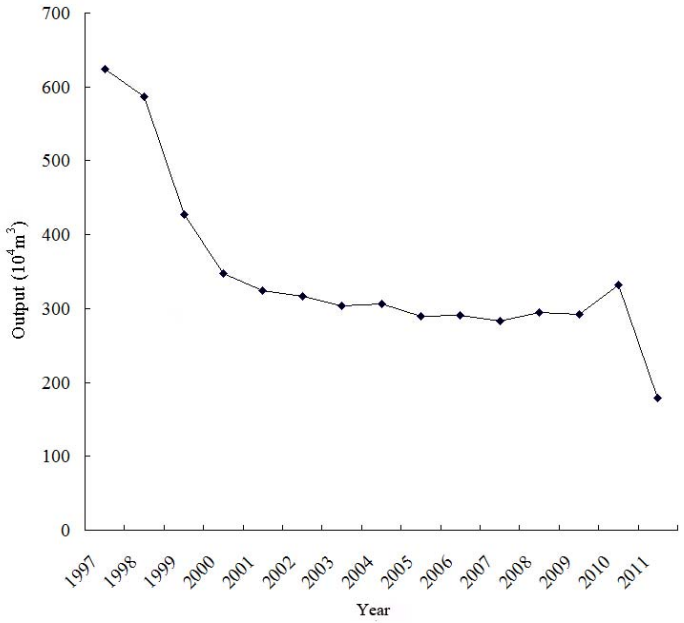


Figure 4.28 Timber outputs of sample enterprises where natural forest resources protection projects were implemented. Source: National Report on Monitoring of Social and Economic Benefits from Key Forestry Projects

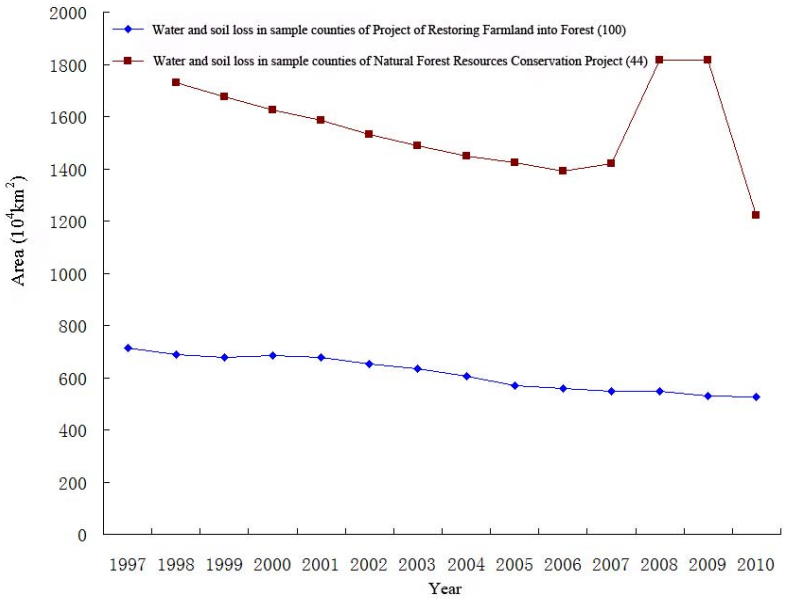


Figure 4.29 Soil erosion in sample counties where natural forest resources protection projects and returning-farmlands-to-forests projects were implemented. Data in the figure are sample data. Source: National Report on Monitoring of Social and Economic Benefits from Key Forestry Projects

(4) Pollution control

Remarkable achievements have been accomplished in reducing pollutant emissions. Substantial growth is witnessed in the percentage of flue-gas desulfurization (FDG) units installed out of the total thermal power facilities (Figure

4.30), the rate of municipal waste water treatment (Figure 4.31) and the amount of recycling of industrial solid wastes (Figure 4.32). However the rate of reuse of industrial solid wastes in the past two years dropped slightly.

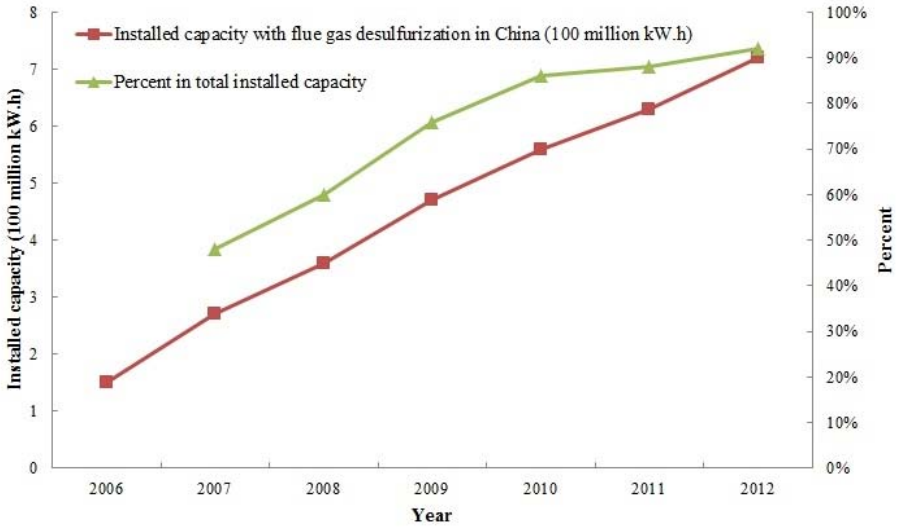


Figure 4.30 P**ercentage of FDG units installed out of total thermal power facilities.**
Source: China Report on the State of the Environment and Environmental Statistics Yearbook

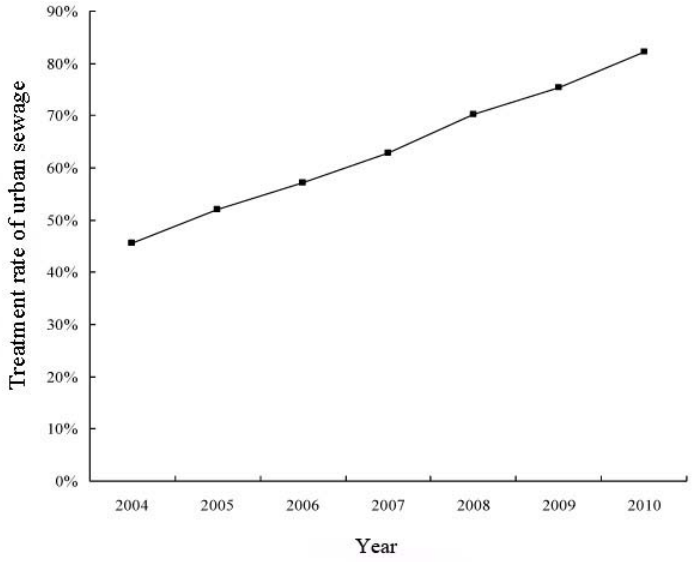


Figure 4.31 Rate of municipal wastewater treatment across China. Source: National Environmental Statistics Gazette

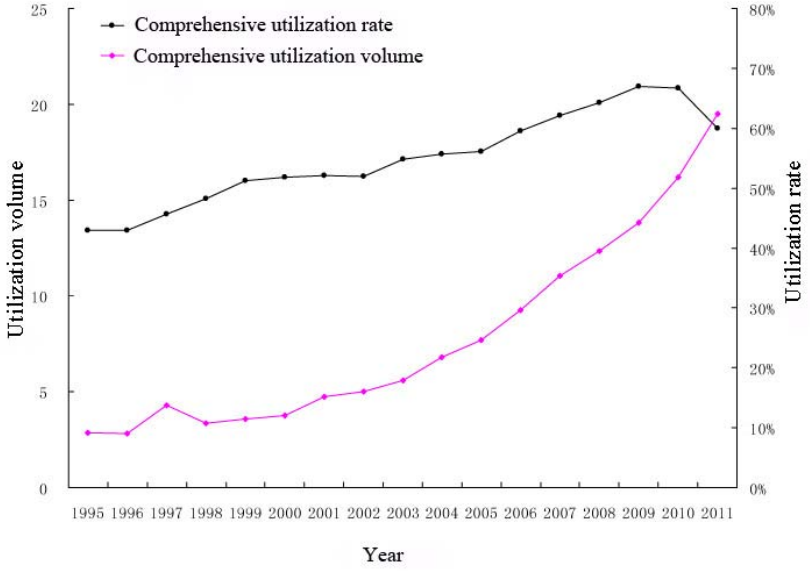


Figure 4.32 Reuse of solid wastes. Source: National Environmental Statistics Gazette

(5) Comprehensive use of resources

The number of solar water heaters and solar stoves used across the country is increasing year by year (Figure 4.33), with the number of solar water heaters in 2011 reaching 62.32 million, a nearly-10-time increase over that in 1997. The annual amount of gas generated from disposal of agricultural wastes and the total pond capacities for disposing agricultural wastes are also climbing up year by year (Figure 4.34), with the two indicators in 2011 being 60 times and 77 times higher than those in 1997 respectively.

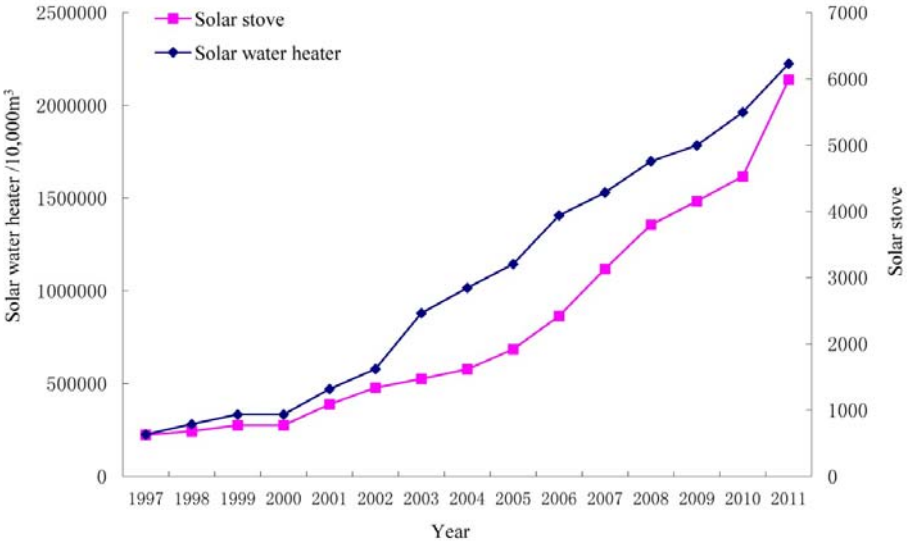


Figure 4.33 Number of solar water heaters and stoves used in China
Source: China Agricultural Statistics Material

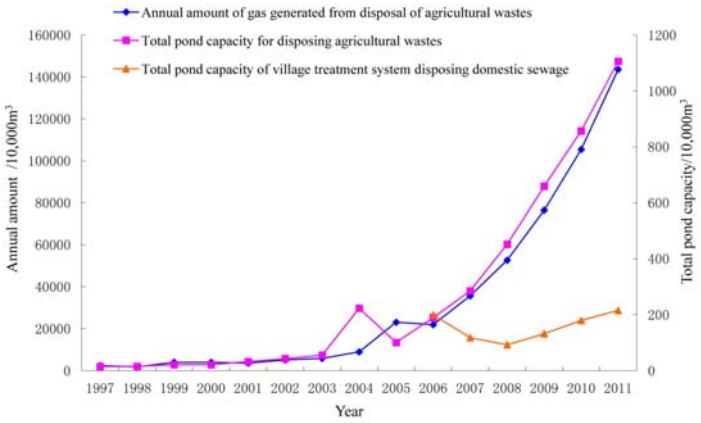


Figure 4.34 Use of agricultural wastes in China. Source: China Agricultural Statistics Material

(6) Public awareness

By using Google or Baidu advanced search engines to search key words 'biodiversity' and 'China' , the results show that such items are increasing (Figures 4.35 and Figure 4.36), indicating that biodiversity is increasingly attracting public attention.

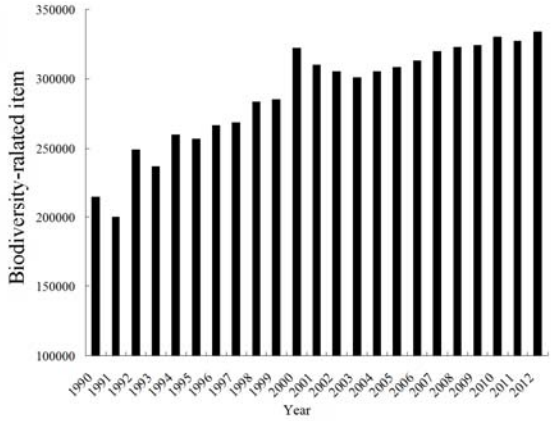


Figure 4.35 China biodiversity items searched through Google in different years

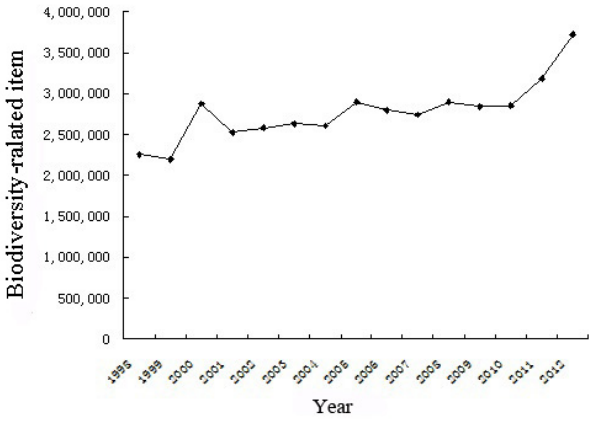


Figure 4.36 China biodiversity items searched through Baidu in different years

(7) Knowledge of conservation and sustainable use of biodiversity

By searching academic papers on biodiversity published annually during 1990-2012, through Chinese VIP database, as well as those on biodiversity in China published every year during the same period through ENSCO & ISI WEB OF SCIENCE, the results show that publications on biodiversity are increasing year by year (Figure 4.37).

(8) Investments into biodiversity conservation

In recent years, China has increased substantially its investments into biodiversity conservation. The investments into projects, such as natural forest resources protection, wild animal and plant conservation, establishment of nature reserves and wetland conservation, have increased from 9.7 billion yuan RMB in 2001 to 21.77 billion yuan RMB in 2011, with the average annual increase of 13.7%, providing financial support to biodiversity conservation (Figure 4.38).

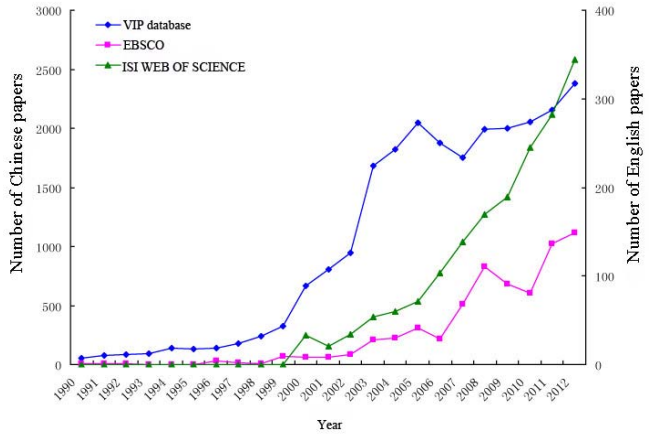


Figure 4.37 Number of academic papers on biodiversity

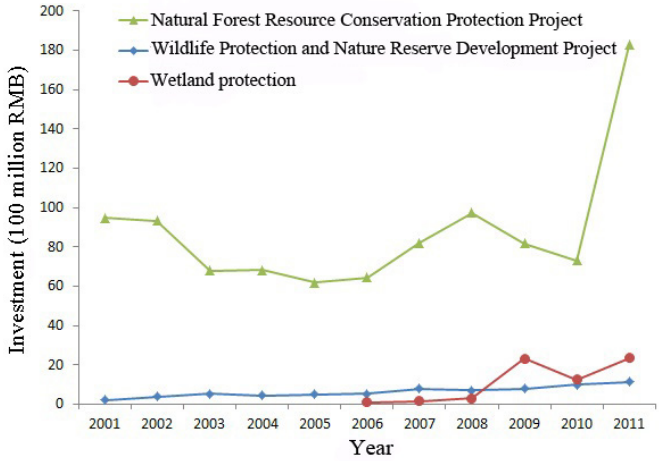


Figure 4.38 Investments into biodiversity conservation
Source: China Forestry Statistics Yearbook

To sum up, in recent years the Government of China has reinforced its efforts in biodiversity conservation, through measures such as strengthening conservation policies, expanding networks of conservation, restoring degraded ecosystems, controlling environmental pollution, strengthening science and technology development, promoting public participation and increasing investments. Positive achievements have been made in biodiversity conservation; the ecological damage has been reduced; ecosystem functions in some regions have been restored and the populations of some key protected species increased to some extent. However the biodiversity decline trend in China has not been yet contained and there are many challenges for biodiversity conservation due to shrinking areas and degrading functions of habitats for wild species, serious pollution of some key river basins and marine areas, growing number and expansion of invasive alien species in some regions, large-scale plantations of single tree species and negative impacts of climate change on biodiversity.

4.3 Overall Assessment of China's Progress in Implementing the Strategic Plan for Biodiversity and Achieving the 2020 Biodiversity Targets

Assessments were made of progress in the implementation of the 2020 Biodiversity Targets by using the biodiversity indicators (see detailed assessments in annex 2). For targets 2, 16 and 18, no assessments were made due to lack of relevant national indicators. Various levels of improvements were noted in indicators for targets 1,3,4,5,7,8,10,11,14,15,17,19 and 20, indicating that implementation of these targets is on the right track. In particular, considerable progress has been made in implementing target 3 (incentive measures), target 5 (habitat degradation and loss reduced), target 8 (environmental pollution controlled), target 11 (protected areas and management effectiveness strengthened), target 14 (important ecosystem services restored and ensured), and target 15 (resilience and carbon sequestration of ecosystems reinforced). However the worsening trends are noted in the majority of indicators for grassland ecosystem conservation in target 5, target 6 (sustainable fishery), target 12 (endangered species protected), and target 13 (genetic resources protected), indicating that more effective strategies and measures are needed to implement these targets, though tremendous work has been done. In conclusion, China is on the right track and making positive progress in implementing the Strategic Plan for Biodiversity and achieving the 2020 Biodiversity Targets, however China still needs to be more determined, take more effective measures and invest more resources to achieve the 2020 targets.

Meanwhile, more indicators need to be developed on biodiversity values, sustainable consumption, ecosystem degradation, impacts of agriculture, forestry and fishery on biodiversity, impacts of climate change on biodiversity, representativeness and management effectiveness of protected areas, and access to genetic resources and benefit-sharing from their use. More attention should be given to conservation of

ecosystems as a whole in particular grassland ecosystems and marine ecosystems, conservation of endangered species and genetic resources, and prevention and control of invasive alien species.

4.4 Contributions to Achievement of Millennium Development Goals

In September 2010, the Government of China issued Progress Report on China's Implementation of the Millennium Development Goals (MDGs) (2010 edition). The report pointed out that China had made positive progress in achieving MDGs. China has achieved ahead of the time three targets, namely 'halving the poor and hungry population', 'primary education' and 'decreasing the child mortality rate', and one sub-target on 'safe drinking water' under the target on environmental sustainability. Other targets are expected to be achieved in time. As said in Part I of this report, biodiversity provides conditions for human survival and material foundations for social and economic sustainable development. The efforts made by the Government of China towards biodiversity conservation contribute significantly to the achievement of MDGs. Certainly China is still facing challenges in fully achieving MDGs, in particular sustainability, including in addressing in imbalance between urban and rural developments and among regions, environmental pressures, and biodiversity loss. To this end, China will continue to implement the "scientific development" approach, deepen various reforms and speed up economic restructuring and transition in growth patterns in efforts to build an ecological civilization and Beautiful China and achieve MDGs.

4.5 China's Experiences in the Implementation of the Convention

Through long-term explorations and practices, China has embarked on a path of biodiversity conservation that suits China's national circumstances, which enriches the global experiences in biodiversity conservation.

(1) Governments taking leading roles, combined with public participation. Biodiversity conservation as one cause benefiting the public requires investments by governments. Governments of all levels in China have integrated biodiversity conservation into their planning for social and economic development and been increasing investments into biodiversity conservation. Meanwhile, through adjusting relevant policies and measures, they are trying to fully mobilize the civil society participation in biodiversity conservation by increasing their public awareness and their level of participation so that all members of the society care about biodiversity and support biodiversity conservation. For example, a Union of Conservers has been established in Shennongjia Nature Reserve, composed of governments, management bodies, civil society and all other key stakeholders, in common efforts to promote biodiversity conservation in that area.

(2) Inter-departmental interaction and coordination with mechanisms in place for the environment department to coordinate while relevant departments make joint efforts. To further improve the existing mechanisms such as China Coordinating Group on Implementation of the Convention on Biological Diversity and the Inter-ministerial Joint Conference on Conservation of Biological Resources, China has recently established National Committee on Biodiversity Conservation headed by the Ministry of Environmental Protection and involving 25 departments. These three mechanisms have played an important role in biodiversity conservation in China. Practice has proven that mechanisms with the environment department to coordinate while other relevant departments make joint efforts and implement their respective responsibilities are suitable for China's national circumstances.

(3) Priority given to conservation while combining both conservation and rational use. Priority is given to biodiversity conservation while pursuing social and economic development goals. By following the rule of nature and the principle of "conservation while pursuing development goals, and development in the midst of conservation", important ecosystems, species and genetic resources are effectively protected. With the prerequisite of effective protection, biological resources should be rationally developed and used to increase incomes of local communities and improve their well-beings.

(4) Implementation driven by projects, with breakthroughs made in key regions while promoting implementation at broader areas. While implementing key ecological projects, biodiversity demonstration projects are implemented in important ecosystems such as forests, grasslands and wetlands and ecologically vulnerable regions. Meanwhile, relevant policies and regulations are improved and updated NBSAP was developed and all of them are being implemented to promote biodiversity conservation across the country.

(5) Implementation enhanced by innovations in both science and technology and management. Professional education and training in the field of biodiversity is strengthened in order to create innovative capacities for conservation and use of biodiversity. A system is in place for development of knowledge and technologies related to biodiversity, with independent intellectual property rights. Meanwhile relevant policy and regulatory systems, standards and monitoring and early warning systems are improved to promote science-based and rule-based management of biodiversity conservation and to upgrade biodiversity management level.

(6) International cooperation for implementation at both national and global level. China has been fulfilling its international obligations and actively participating in relevant international negotiations and building of multilateral systems in this field. China has been also undertaking international cooperation and exchanges in this field including introducing advanced techniques and concepts of

management from other countries and implementing biodiversity projects supported by international donors. Meanwhile China has been upgrading biodiversity conservation and management, including through allowing governments of all levels to play key roles in biodiversity conservation and integrating biodiversity goals and tasks into the planning processes of various levels of governments and relevant departments.

Part V. Main Issues and Priority Actions for Biodiversity Conservation in China

Under the leadership of the Government of China and with the support of the whole society, China has achieved tremendously in biodiversity conservation. However we should be clear that China is still facing a serious situation in biodiversity conservation. Implementing nearly a half of actions proposed in updated NBSAP is still very challenging, and the biodiversity decline trend has not been fundamentally contained, and therefore there is a long way to go for biodiversity conservation in China.

5.1 Main Issues

(1) Relevant regulations and mechanisms need to be further improved. China's existing laws on biodiversity conservation are yet to be improved, with some laws and regulations not adequate to address current social and economic realities. For example, some laws and regulations such as the Environmental Protection Law, Wild Animal Protection Law, Wild Plant Protection Regulation and Regulation on Nature Reserves urgently need to be revised or improved. There are no specialized laws or regulations to address issues such as access to genetic resources and benefit-sharing, wetland conservation and prevention and control of invasive alien species. Penalties for violating some laws and regulations are still inadequate, and for this reason some laws and regulations cannot deter relevant crimes or violations.

(2) Awareness of conservation is yet to be further enhanced. The public awareness of biodiversity conservation and of risks of inaction is yet to be further enhanced. Many people have not recognized the importance of biodiversity conservation, therefore their awareness of and participation in conservation is low. Some local governments one-sidedly pursue economic development goals. They promote economic development at the cost of biodiversity where economic development and biodiversity conservation conflict. The private sector is not enthusiastic about getting involved in biodiversity conservation. Decision makers and managers do not have adequate knowledge of biodiversity. Supervisory forces and capacities of civil society are not adequate.

(3) Conflicts between conservation and development and use. With the acceleration of urbanization and industrialization processes in China, biodiversity conservation is facing serious threats. For example, the population in pastoral areas has grown several times and the population density in arid grassland areas of north China has reached 11.2 persons/km^2, 2.2 times as many as 5 persons/km^2, the internationally recognized ecological capacity in arid grassland areas. Demands for wild medicinal herbs are increasing rapidly. As a result the number of some wild species is declining due to overexploitation for a long time. Fishing and harvesting

methods are still coarse and predatory, in particular use of electricity for fishing that has caused serious damage to fishery resources and the aquatic environment and ecology. Most of the biodiversity hotspots of China are located in those remote, economically underdeveloped regions, so conflicts between conservation and economic development will be there for long, thus adding further pressures on biodiversity conservation.

(4) Inadequate investments and expenditures. Though the Government of China has made tremendous investments into biodiversity conservation, gaps in funds are still big as China has huge land areas, rich biodiversity and daunting challenges for biodiversity conservation. Capacities for surveying and monitoring biodiversity, establishment and management of nature reserves and restoration of biodiversity are still very weak and funds are seriously inadequate. Due to inadequate law enforcement conditions and lack of adequate infrastructure or equipment in some sites, relevant laws cannot be enforced.

(5) Technological research lacking behind. Due to inadequate investment for long and lack of professional researchers and techniques, researches in some areas such as biodiversity baseline survey and practical technologies and models for conservation are very weak. Some new issues and technologies are yet to be explored, in particular surveying and monitoring of biodiversity, *in-situ* conservation and biodiversity restoration should be given due attention.

5.2 Priority actions

(1) To improve laws and regulations for biodiversity conservation and reinforce law enforcement.

- To revise the Environmental Protection Law, Wild Animal Protection Law, Wild Plants Protection Regulation and Nature Reserves Regulation;
- To develop new laws or regulations such as Wetland Conservation Regulation, Regulation on Invasive Alien Species and Regulation on Access to Genetic Resources and Benefit-sharing;
- To improve rules of ownership of natural resources and rules for their use control, and to establish a system of strictest source protection as well as a system of damage compensation and life-time accountability for ecological damage;
- To establish as early as possible mechanisms of ecological compensation, and integrate biodiversity into ecological compensation policies, in particular compensation mechanisms in biodiversity priority areas, so that policy and financial support will be provided to these areas;
- To strengthen law enforcement capacities and reinforce crackdown on illegal activities destroying biodiversity and examination of the import

and export of species.

(2) To promote public participation and enhance public awareness of conservation.

- To undertake various forms of biodiversity communication and education activities and to increase public awareness of conservation including through fully playing roles of civil society organizations and the private sector;
- To explore mechanisms and policies for establishing social supervision over biodiversity conservation;
- To develop citizen sciences and promote public participation in biodiversity conservation activities so that the whole society will make joint efforts to promote conservation and sustainable use of biodiversity.

(3) To implement updated NBSAP and National Plan for Major Function Zones.

- To implement National Plan for Major Function Zones, establish a system of land development protection, improve spatial layout of land development and propose policies and measures for biodiversity conservation in major function zones;
- To identify red lines for ecological conservation and ensure ecological security of national land;
- To strengthen supervision over biodiversity priority areas and integrate biodiversity into relevant national, sectoral and local planning processes;
- To strengthen environment management of development activities and integrate biodiversity into environmental impact assessments (EIAs) of major projects, regional planning and strategic planning as well as to implement responsibilities for ecological restoration;
- To establish review and supervision mechanisms to promote effective implementation of relevant plans and programmes.

(4) To further improve *in-situ* conservation networks and strengthen conservation efforts.

- To improve spatial structure of nature reserves and to establish networks of biodiversity conservation and a system of national parks;
- To strengthen capacities of management of nature reserves, scenic spots, forest parks, wetland parks and aquatic germplasm conservation areas ;
- To continue implementing key ecological projects such as natural forest resources protection, returning cultivated land to forests, returning grazing land to grasslands, construction of forest belts in north, northeast and northwest China and the Yangtse River Basin, control of origins of sandstorms affecting Tianjin and Beijing, control of rockiness in Karst areas, wetland protection and restoration, establishment of protected areas and control of soil erosion;
- To initiate major projects on biodiversity conservation and to establish a

mechanism for integrating biodiversity conservation with poverty reduction.

(5) To enhance capacities to meet emerging threats and challenges.

- To establish as early as possible a monitoring and early warning system of invasive alien species;
- To take precautionary measures, to undertake risk assessments of alien species intentionally introduced, to implement risk management measures and organize elimination of alien species that have caused major damage;
- To undertake risk assessments of GMOs and fundamental researches on detecting their impacts on the environment;
- To develop technologies for environmental monitoring and detection of GMOs and improve relevant technical standards and specifications.

(6) To strengthen mechanisms and institutional capacities and to upgrade management level.

- To strengthen the coordination of China National Committee on Biodiversity Conservation;
- To continue roles of China Coordinating Group on the Implementation of the Convention on Biological Diversity and the Inter-ministerial Joint Conference on Conservation of Biological Resources;
- To further strengthen capacities of all relevant departments involved in biodiversity conservation in particular capacities of and support to local governments and communities, and to upgrade their management level constantly.

（7） To increase investment.

- To broaden channels of investment and increase investments from central and local governments;
- To guide private and international investments and loans to biodiversity conservation so as to create mechanisms of various channels of investment;
- To consolidate scattered funds for biodiversity conservation and increase their efficiency of use;
- To increase investments into biodiversity from government budgets, in particular support to capacity building, fundamental science and research and ecological compensation.

（8）To establish mechanisms for surveying and monitoring of biodiversity and launching of results.

- To undertake biodiversity surveys on a regular basis;
- To establish biodiversity monitoring and early warning system to know in time dynamic changes in biodiversity;
- To launch Biodiversity Red Lists in a timely manner;
- To monitor effectively important ecosystems and species.

（9）To strengthen professional education and research.

- To strengthen professional education in biodiversity and to further improve research focusing on technical issues such as biodiversity formation mechanics, causes of loss, models of conservation and restoration, evaluation and ecological compensation;
- To strengthen collection, storage and development of genetic resources;
- To provide scientific and technical support to biodiversity conservation and management.

（10）To strengthen international cooperation and exchanges.

- To implement the obligations under the Convention;
- To participate actively in building of multilateral systems;
- To undertake extensively international exchanges and cooperation and to introduce advanced technologies and experiences from other countries to upgrade China's capacities and levels of biodiversity conservation.

Appendix I. Information Concerning Party and Process of Preparing National Report

A. Party

Party	China
NATIONAL FOCAL POINT	
Full name of institution	Department of International Cooperation, Ministry of Environmental Protection
Name and title of contact person	Zhang Jieqing, Director
Mailing address	No. 115 Xizhimennei nanxiaojie, Beijing, China
Telephone	+86-10-66556520
Fax	
Email	zhang.jieqing@mep.gov.cn
CONTACT PERSON FOR NATIONAL REPORT(IF DIFFERENT FROM ABOVE)	
Full name of institution	Department of Nature and Ecology Conservation, Ministry of Environmental Protection (Office of Biodiversity Conservation)
Full name and title of contact person	Zhuang Guotai, Director General (Director of Office of Biodiversity Conservation)
Mailing address	No. 115 Xizhimennei nanxiaojie, Beijing, China
Telephone	
Fax	
Email	
SUBMISSION	
Officer responsible for signature for submission of national report	
Date of submission	

B. Process of National Report Preparation

1. Developing an outline of the report and establishing an expert group for drafting the report

During January and February 2013, the Ministry of Environmental Protection developed a work programme and an outline for the fifth national report, and invited members of China Coordinating Group on the Implementation of the Convention on Biological Diversity to recommend relevant experts. All members recommended experts as required and the Ministry of Environmental Protection selected experts after having reviewed their qualifications.

2. First expert group meeting held to initiate the project and identify specific tasks

On March 8, 2013, the expert group had its first meeting in Beijing to officially initiate the drafting of the report. At this meeting the outline of the report was further improved, and a work plan developed and specific tasks assigned to each expert.

3. Data collection, review and compilation and drafting of sector reports

In April 2013, the experts recommended by relevant departments collected materials and data from their respective departments following requirements specified in the outline. These experts submitted their sector reports during May-August 2013.

4. Expert workshop held to study indicators for assessing the 2020 targets

On 9 June 2013, the Ministry of Environmental Protection held in Beijing a workshop on indicators to assess the 2020 targets. The workshop discussed and improved indicators for assessing the 2020 targets proposed by the expert group. The workshop also requested experts from different sectors to provide data for assessing the 2020 targets.

5. Drafting the first draft of the fifth national report

The expert group prepared the first draft of the fifth national report following the review and integration of sector reports.

6. Three expert workshops held to discuss about the first draft

On 14 November 2013, the Ministry of Environmental Protection held a second meeting of the expert group to discuss about the first draft of the fifth national report. The meeting provided suggestions for revising the first draft. On 12 November and

24 December 2013 respectively, one expert workshop and a third meeting of the expert group on report preparation were held to discuss again about indicators for assessing the 2020 targets and the revised draft. A draft of the fifth national report for consultation was formed after having taken on board suggestions from various experts involved.

7. Consultations with members of China Coordinating Group

In early January 2014 the Ministry of Environmental Protection consulted with the member departments of China Coordinating Group on the Implementation of the Convention on Biological Diversity. All departments reviewed the national report and provided very good comments and suggestions. The expert group further revised the national report by incorporating suggestions from these departments and prepared the final report and submitted it to the Ministry of Environmental Protection for approval.

8. Approval, translation and submission of the fifth national report

In 7 March 2014, the fifth national report was approved by the Ministry of Environmental Protection. During January-March 2014 the Chinese version of the fifth national report was translated into English, and both versions were submitted to the Secretariat in March 2014.

The following ministries, departments and institutions were involved in the preparation of the fifth national report:

Ministry of Environmental Protection, National Development and Reform Commission, Ministry of Education, Ministry of Science and Technology, Ministry of Finance, Ministry of Land and Resources, Ministry of Housing, Urban and Rural Development, Ministry of Water Resources, Ministry of Agriculture, Ministry of Commerce, General Administration of Customs, State Administration for Industry and Commerce, State Administration of Quality Supervision, Inspection and Quarantine, State Administration of Press, Publication, Radio, Film and Television, State Forestry Administration, State Intellectual Property Office, State Tourism Administration, Chinese Academy of Sciences, State Oceanic Administration, State Administration of Chinese Medicine, the State Council Leading Group Office of Poverty Alleviation and Development, National Office of Management of Import and Export of Endangered Species, National Office of Implementation of the Ramsar Convention, Office of National Coordinating Group on Responses to Climate Change, Desertification Prevention and Control Center of SFA, Institute of Geography and Resources, Institute of Botany, Institute of Zoology, Research Institute of Micro-organisms of CAS, Institute of Crops of Chinese Academy of Agricultural Sciences, Institute of Agricultural Environment and Sustainable Development, Beijing Institute of Animal Husbandry and Veterinary, General Station

for Conservation of Agricultural Ecology and Resources of MOA, Chinese Research Institute of Fishery, Chinese Academy of Forestry Sciences, Chinese Institute of Inspection and Quarantine Sciences, Beijing University of Forestry, Central China University of Agriculture, National Marine Environment Monitoring Centre, Third Institute of Oceanography, Chinese Academy of Chinese Medicine, Foreign Economic Cooperation Center of MEP, Nanjing Institute of Environmental Sciences of MEP.

Support from the Global Environment Facility to the preparation of this report is acknowledged with thanks.

Appendix 2 List of Personnel Involved in the Preparation of China's Fifth National Report on the Implementation of the CBD

List of Expert Group on Report Preparation

	Recommended by	Name	Institution	Title
1	Ministry of Environmental Protection	Xu Haigen	Nanjing Institute of Environmental Sciences, MEP	Professor /Deputy Director General/Head of expert group
2	Ministry of Environmental Protection	Ouyang Zhiyun	Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences	Professor
3	Ministry of Environmental Protection	Zhu Liucai	Foreign Economic Cooperation Centre, MEP	Professor
4	Ministry of Environmental Protection	Wang Zhi	Nanjing Institute of Environmental Sciences, MEP	Deputy Director/Associate Professor
5	Ministry of Environmental Protection	Ding Hui	Nanjing Institute of Environmental Sciences, MEP	Associate Professor /Division Chief
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List of Participants of First Meeting of the Expert Group

(8 March, 2013, Beijing)

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(4 November, 2013, Beijing)

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(24 December, 2013, Beijing)

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Annex I. Assessment of Progress in Implementing Updated NBSAP

Note:  fully achieved;  significant progress;  considerable progress;  some progress;  no progress.

Strategic Goals	Priority Areas	Actions identified	Actions undertaken	Level of progress
1. By 2015, biodiversity decline in key regions will be effectively contained 2. By 2020, biodiversity loss will be basically controlled. 3. By 2030, biodiversity will be effectively protected.	1. Improving policy and regulatory systems for conservation and sustainable use of biodiversity	**Action 1.** To develop policies to promote conservation and sustainable use of biodiversity.	● Incentives measures favourable for biodiversity conservation have been developed and are being implemented (see details in section 2.3.10 of Part II). ● However pricing, taxation, loan, trade, land use and government procurement policies in this regard are yet to be improved.	
		Action 2. To improve the legal system for conservation and sustainable use of biodiversity.	● Legal and regulatory systems for biodiversity conservation have been basically established. (see details in section 2.3.1 of Part II). ● In recent years many studies have been undertaken on legislations related to protected areas, wetland conservation, management of genetic resources, prevention and control of invasive alien species and biosafety management of GMOs, however considerable difficulties exist for development and adoption of these laws or regulations.	
		Action 3. To establish and improve bodies for conservation and management of biodiversity, and to improve cross-sectoral coordination mechanisms.	● China Coordinating Group on the Implementation of the Convention on Biological Diversity and the Inter-ministerial Joint Conference on Conservation of Biological Resources were established respectively in 1993 and 2003. ● The Government of China established China National Committee on International Year of Biodiversity to coordinate the IYB-related activities in 2010. In 2011, the State Council approved changing this Committee to 'National Committee on Biodiversity Conservation'. ● These three coordination mechanisms headed by the Ministry of Environmental Protection and involving various departments play an important role in promoting biodiversity conservation in China. ● The people's governments of most of the provinces (autonomous regions, province-level municipalities) have strengthened departments responsible for the environment, agriculture, forestry and oceanic administration, and established inter-departmental coordination mechanisms.	
	2. Integrating biodiversity into sectoral and regional planning and promoting sustainable use	**Action 4.** To integrate biodiversity into sectoral and regional planning processes and plans.	● Requirements for biodiversity conservation have been taken into account in developing sectoral or cross-sectoral plans by the sectors of development and reform commission, education, science and technology, land and resources, agriculture, commerce, customs, industry and commerce, quality supervision, inspection and quarantine, forestry, tourism, oceanic administration, Chinese medicine and poverty reduction (see details in Part III). ● All provinces (autonomous regions, province-level municipalities) are developing their biodiversity strategies and action plans. Among them, 7 provinces have launched their BSAPs. Liaoning Province has issued a biodiversity strategy and action plan for Liaohe River Basin. ● However implementation of NBSAP and provincial BSAPs need to be further strengthened.	

		Action 5. To ensure that biodiversity will be sustainably used.	● Since 2000 creation of eco-provinces, eco-cities and eco-counties has been organized. Currently 15 provinces have initiated eco-province building and 13 provinces have issued plans or programmes for building eco-provinces. More than 1,000 counties or cities have started their eco-city or eco-county building. Since 2007, 38 counties or cities have been named as national-level eco-cities or eco-counties, 1,559 towns as national-level eco-towns and 238 villages as national-level eco-villages. ● However pilot work on biodiversity evaluation is yet to be expanded, and the experiences of various sectors in promoting production and consumption patterns favorable for biodiversity are yet to be summarized and disseminated.	
		Action 6. To reduce impacts of environmental pollution on biodiversity.	● The Government of China has identified significant reduction in the total amount of main pollutants as one of binding targets for social and economic development, in efforts to solve prominent environmental problems. From 2000 to 2010, the overall concentration of main pollutants went down. In the recent decade, the intensity of pollutant emission per unit of GDP has declined by more than 55%. Since 2004, CO_2 emission intensity has dropped by 15.2%. ● The plan for water pollution prevention and control in key river basins (2011-2015) has been issued and is being implemented to enhance pollution abatement in rivers and lakes. The percentage of seven major rivers with water quality better than that of Grade III increased from 41% in 2005 to 64% in 2012, and the percentage of those with water quality lower than that of Grade V decreased from 27% to 12.3%. Underground water pollution prevention and control has been also strengthened. A national plan in this regard is being implemented and a plan for preventing and controlling underground water contamination in north China plains has been developed. ● The Twelfth Five-year Plan for Air Pollution Prevention and Control in key regions has been launched and is being implemented, and a revised Standard for Air Quality has been issued. In 2012 the central government provided 1.09 billion yuan RMB to support the renovation of coal-fired boilers in 15 key cities listed in the Plan. As a result coal boilers with capacities of 28,997 tons have been renovated. Among them dust removal equipment with capacities of 15,406 tons has been renovated, and coal use for equipment with capacities of 13,591 tons has been replaced with clean energy. ● By the end of 2012, out of 57 facilities for integrated disposal of hazardous wastes identified by National Programme for Building Facilities for Disposal of Hazardous and Medical Wastes, 36 facilities have been built, with capacities of integrated disposal reaching 1.43 million tons/year; out of 271 facilities for integrated disposal of medical wastes planned, 231 facilities have been built with capacities of integrated disposal reaching 428,000 tons/year. ● By the end of 2013, the central government has allocated specialized funds for rural environment improvement totalling 19.5 billion yuan, and 46,000 villages and more than 87 million farmers benefited. In 2012 the central government invested 1.33 billion yuan into building 2.946 million clean toilets in rural areas. By the end of 2012, 3.346 million clean toilets have been built in rural areas across the country, exceeding the original target set for the year. ● About 6.7 million tons of chromium was left untreated, most of which were stored for over ten or twenty years and even fifty years. Disposal of chromium started from 2005. By the end of 2012, almost all chromium left from history have been disposed of, with 2.3 million tons disposed of in 2012 only, three times higher than the average amount disposed of in the past six years before that. ● However the density of emission of pollutants per unit of GDP is still very high, and the amount of	

			waste water discharged is still increasing.	
	3. Undertaking surveys, assessments and monitoring of biodiversity	**Action7.** To undertake baseline surveys of biological resources and ecosystems.	● Eight forest resources surveys, second national survey on wetlands, second national survey on livestock genetic resources, specialized survey on marine biodiversity, survey and cataloguing of biological resources in southwest China, survey on agricultural biological resources in Yunnan and neighboring areas, and a remote-sensing survey and assessment of ecological changes in the decade from 2000 to 2010 have been completed. ● Ongoing surveys include a second national survey on key wild animal resources, a second national survey on key wild plant resources, a fourth survey on giant pandas and a pilot consensus on Chinese medicinal resources. ● Based on the above surveys, national biodiversity information system and a network of sharing national specimens and information have been established, however the scope and depth of surveys are yet to be expanded and relevant systems need to be improved.	
		Action 8. To survey and catalogue genetic resources and associated traditional knowledge.	● By the end of 2012, the total agricultural crops collections have reached 423,000 accessions, an increase of 30,000 accessions over those in 2007. To better store collected genetic resources, China has strengthened the construction of storage facilities. On one hand China has expanded and renovated 1 existing long-term bank, 1 national copy banks, 10 mid-term storage banks and 3 national germplasm nurseries (including 2 plantlets libraries). On the other hand China has built 7 more national germplasm nurseries. ● China has established a network of conservation of livestock genetic resources primarily consisting of conservation farms and complemented by protected areas and gene banks. By 2011, this network has effectively protected more than 100 key resources. China's livestock fiber cell bank has become the world's biggest, with 58,000 cells of 95 local varieties stored in the cell bank. ● Surveys have been undertaken of traditional knowledge associated with genetic resources in areas inhabited by minorities, and relevant databases have been established based on these surveys.	
		Action 9. To undertake monitoring and early warning of biodiversity.	● China has developed technical guidelines for monitoring typical ecosystems and important species, however relevant standards have not been issued, so standardization and regulation of monitoring activities are yet to be strengthened. ● National biodiversity monitoring network has been designed, and national forest biodiversity monitoring network has been established. Also established a monitoring network of birds and amphibians and demonstration is ongoing, however national long-term biodiversity monitoring network with wide coverage and high level of representativeness is yet to be established. ● Studies have been undertaken on the models of biodiversity prediction and early warning, however the technical system of early warning and emergency response mechanisms are yet to be established.	
		Action 10. To promote and coordinate establishment of information systems on biological resources and genetic resources.	● For information sharing, three main databases and sharing platforms have been established for genetic resources: ● National Platform for Sharing Plant Germplasm Resources (http://icgr.caas.net.cn/pt/) covers agricultural crops, perennial and cloned crops and timbers (including bamboos, rattans and flowers), medicinal plants, tropical crops, important wild plant and grass germplasm resources. ● The platform for germplasm resources of domesticated animals (http://www.cdad-is.org.cn/) covers genetic resources of pigs, cows, sheep and other domesticated animals.	

			● The platform for microorganisms and fungi (http://www.cdcm.net/indexAction.action) covers information of 162,000 strains of bacteria, accounting for 40-45% of the total micro-organisms in China.	
		Action 11. To undertake comprehensive assessments of biodiversity.	● In 2012 China completed a national biodiversity assessment, with unit of assessment being at county level. For the first time China has collected data concerning distribution at county level of 34,039 wild vascular plant and 3,865 wild vertebrate species. Through this assessment China has almost known the current status, spatial distribution of and main pressures on biodiversity in land areas. The assessment has identified biodiversity hotspots across the country as well as major gaps of conservation. A report of assessment of China's baseline status of biodiversity has been published. ● In 2011 China initiated a Project on Remote-sensing Survey and Assessment of Ecological Changes in China during the Decade from 2000 to 2010. The overall objective of this project is to know fully changes and evolutions in the distribution, layout, quality and services of ecosystems across the country in the last decade. ● China has issued technical guidelines for assessing economic values of genetic resources. China is developing technical guidelines for evaluating ecosystem services and functions. China has undertaken tremendous pilot work in the economic evaluation of biodiversity. ● In September 2013, China issued China Biodiversity Red List-Higher Plants Volume. Work is on-going on Biodiversity Red List-Vertebrates Volume.	
	4. Strengthening *in-situ* conservation of biodiversity	**Action 12.** To improve and implement in a coordinated manner national planning for protected areas.	● In 1999 China issued National Programme for Nature Reserves for 1996-2010. In 2003 China approved National Programme for Wetland Conservation for 2002-2030. China is developing a national plan for development of nature reserves. ● China has strengthened establishment of protected areas in biodiversity priority areas, improved spatial layouts of PAs and enhanced overall capacities of conservation. ● Since 2006, China and Russia have established an intergovernmental working group on transboundary protected areas and biodiversity conservation, which meets on a regular basis every year. So far this working group has had six meetings. Both sides have signed cooperation agreements such as China-Russia strategy for development of networks of transboundary protected areas in Heilongjiang River Basin and China-Russia agreement on establishment of protected areas in Xingkai Lake. PAs in Sanjiang, Honghe and Bachadao in Heilongjiang Province, China have signed agreements with PAs in Basdak, Daherchel, Xinganski and Bolongski in Russia for cooperation. In 2013, China and Russia signed an agreement on protection of wild tigers. By this agreement both sides will accelerate construction of migratory corridors for tigers and establish transboundary protected areas for tigers. ● In 2009, China and Lao DPR established the first transboundary protected areas-Shangyong, Xishuangbanna-South Tananmuha. In early 2012 the two countries decided to establish another transboundary protected area-Menglamanzhuang, China-Fengshali, Lao DPR border areas.	
		Action 13. To strengthen conservation of biodiversity priority areas.	● In the updated NBSAP, China has identified 35 biodiversity priority areas. China has strengthened establishment of protected areas in biodiversity priority areas, improved spatial layouts of PAs and enhanced overall capacities of conservation. ● China is studying plans, policies, rules and relevant measures for conservation in priority areas.	

		Action 14. To regulate establishment and management of protected areas and to improve management effectiveness of protected areas.	● China has issued a programme for master planning of national-level nature reserves, technical specifications for master planning of nature reserves and for eco-tourism planning in nature reserves, and guidelines for national-level nature reserves management. Based on these guidelines and standards, China has undertaken assessments of management of national-level nature reserves since 2008. By 2012, China has completed assessments of all national-level nature reserves. ● China has strengthened standardized construction of national-level nature reserves, improved management facilities and reinforced supervision measures. By the end of 2013, China has established a total of 407 national-level nature reserves, with areas covering about 940,000 km^2, accounting for 64.3% of the total PAs and 9.8% of the country's total land area. ● Departments responsible for nature reserves from the Ministries of Environmental Protection and Agriculture and SFA have organized many training workshops, providing training on PA-related policies, regulations, standardized management, plan development, capacity building project design, supervision of development activities, information system development and status survey. ● From 2007 to 2012, the Ministry of Environmental Protection together with relevant departments organized many inspections on law enforcement in nature reserves, with a view to preventing damage from irrational development activities to nature reserves.	
		Action 15. To strengthen biodiversity conservation outside protected areas.	● Key ecological projects continue to be implemented, such as natural forest resources protection, returning cultivated land to forests and grazing land to grasslands, construction of forest belts, conservation of wild fauna and flora and wetland conservation and restoration (see details in section 2.3.6 of Part II). Grassland ecosystem conservation and restoration has been strengthened (see details in section 3.7 of Part III). Conservation of marine biodiversity has also been strengthened and obvious results achieved (see details in section 3.14 of Part III). ● In 2012, China initiated a project to rescue wild plants with very small populations. The project lasts five years targeting at 120 wild plants with extremely small populations. The implementation of this project will effectively improve the status of critically endangered, rare plants.	
		Action 16. To strengthen establishment of livestock genetic resources conservation farms and protected areas.	● China has established a network of conservation of livestock genetic resources primarily consisting of conservation farms and complemented by protected areas and gene banks. By August 2012, China has identified 150 national-level conservation farms, protected areas and gene banks. China has rescued a number of livestock species close to extinction, such as Wuzhishan pig, bantam and Jinjiang horse. This network has effectively protected more than 100 key resources. ● China has issued a national list of livestock genetic resources for protection, which includes 138 rare and endangered livestock varieties.	
	5. Undertaking *ex-situ* conservation of biodiversity on a scientific basis	**Action 17.** To establish *ex-situ* conservation system on a scientific and reasonable basis.	● China has established nearly 200 botanical gardens of various kinds at different levels, which collect and store 20,000 species, accounting for two-thirds of China's flora. China has established more than 400 bases for conservation of wild plant germplasms, as well as centers of protection of cycads and orchid germplasms, which have collected and stored over 240 varieties of cycads and over 540 varieties of orchids respectively. ● A germplasm bank of wild biological resources in southwest China has been established in Kunming, Yunnan Province. By April 2013, this bank has collected and stored 76,864 accessions of plant seeds of 10,096 species. ● According to incomplete statistics, China has established more than 240 zoos including animal	

			demonstration areas, and 250 bases of reproduction and rescuing of wild animals. Various places in China have also established unique farms for conserving local varieties of domesticated animals and national-level key breeding farms, storing 138 varieties of domesticated animals.	
		Action 18. To establish and improve system of storage of genetic resources.	See details in Actions 8,10 and 17.	
		Action 19. To strengthen re-introduction of artificially bred species and restoration of wild species.	● In March 2012, China issued a national project plan for protection and rescuing wild plants with extremely small population (2011-2015), targeting at 120 plant species with extremely small population in the first phase of the project. Among them there are 36 national Class A protected plants, 26 national Class B protected plants, and 58 provincial protected plants. A similar plan is being developed for protection and rescuing wild animals with extremely small populations. ● Research has been undertaken on artificial breeding techniques and seedling for those rare wild plants for which market demands are relatively big, such as Matsutake (*Tricholoma matsutake*), Snow Lotus (*Saussurea involucrata*), Dove Tree (*Davidia involucrata*), Desertliving Cistanche (*Cistanche deserticola*), yews and rare orchidaceae. Studies were also undertaken on techniques of reproduction and conservation of endangered animals, and as a result the artificially bred populations of over 50 wild animals are constantly expanding, such as Giant Panda (*Ailuropoda melanoleuca*), Crested Ibis（*Nipponia nippon*）, Chinese Alligator (*Alligator sinensis*), tigers, golden monkeys and Tibetan Antelopes (*Pantholops hodgsoni*). ● Preparations and experiments have been made for reintroduction of extremely endangered orchidaceae in China such as *Doritis pulcherrima* and *Paphiopedilum armeniacum* and some critically endangered species such as *Cycas debaoensis*, *Pachylarnax sinica* and *Cyclobalanopsis sichourensis*. Eight endangered wild animals such as Crested Ibis, Asian Wild Horse (*Equus przewalskii*), Pere David's Deer (*Elaphurus davidianus*), Chinese xenosaurs (*Shinisaurus crocodilurus*), Chinese Alligator, Bactrian Red Deer (*Cervus elaphus yarkandensis*) and Yellow-bellied Tragopan (*Tragopan caboti*) have been reintroduced to nature, and natural reproduction has been realized and new wild populations are being gradually established.	
	6 Promoting access to genetic resources and associated traditional knowledge and benefit-sharing from their use	**Action 20.** To strengthen development and use of genetic resources and related innovation research.	See details in section 2.3.5 of Part II.	
		Action 21. To establish rules and mechanisms for access to genetic resources and associated traditional knowledge and benefit-sharing from their use.	● To regulate development of genetic resources, the Patent Law revised in December 2008 added a provision concerning disclosure of the origin of genetic resources, and clearly provides that patent will not be granted if access to or use of genetic resources violates relevant laws or regulations. ● Policies, rules and CHM are under development for access to genetic resources and associated traditional knowledge and benefit-sharing from their use.	

		Action 22. To establish system of inspection and verification of imported and exported genetic resources.	● State Administration on Quality Supervision, Inspection and Quarantine (SAQSIQ) has established a system of approval of export of biological resources. In 2013, SAQSIQ issued guidance for strengthening inspection and quarantine of imported and exported biological resources, with a view to prevent loss of China's endemic and rare biological resources. ● An examination system is being established with two research centers established for identification and verification and six key labs established for pilot inspection. ● A lot of research projects have been undertaken and some progress made in developing methods for identifying and verifying genetic resources of animals, plants and micro-organisms as well as human beings. ● At the end of 2012, a training workshop was held on the inspection and quarantine of imported and exported biological resources. In early 2013 another training workshop was held for the on-site staff on techniques used for identifying and verifying biological resources. ● However a list is yet to be developed for import and export of genetic resources, and methods, capacities and conditions for rapid identification and verification are still inadequate.	
	7. Strengthening biosafety management of invasive alien species and GMOs	**Action 23.** To enhance capacities of early warning, responses and monitoring of invasive alien species.	See details in section 2.3.8 of Part II.	
		Action 24. To establish and improve system and platform for biosafety assessment, inspection and monitoring of GMOs.	See details in section 2.3.9 of Part II.	
	8. Increasing capacities to respond to climate change	**Action 25.** To develop an action plan to address climate change impacts on biodiversity.	● Studies on climate change impacts on biodiversity have been undertaken. Technologies are being developed for monitoring climate change impacts on biodiversity, and action plan is being developed for biodiversity conservation and adaptation to climate change. ● There is a need to further investigate positive and negative impacts of climate change on biodiversity and further study relevant adaptation measures.	
		Action 26. To assess impacts of biofuels on biodiversity.	● A study on biofuel plantation impacts on biodiversity has been undertaken, however a system is yet to be established to manage environmental safety of biofuel production.	
	9.Strengthening science and technology research and professional education and training	**Action 27.** To strengthen scientific research in the field of biodiversity.	See details in section 2.3.11 of Part II, however more investment needed for biodiversity research, infrastructure development and promotion of research results.	
		Action 28. To strengthen professional education and training in the field of	See details in section 3.2 of Part III. Despite progress in biodiversity professional education, more efforts are needed in this regard, in particular training of taxonomists and leading scientists in this field.	

		biodiversity.		
	10. Establishing mechanisms and partnerships for public participation in biodiversity conservation	**Action 29.** To establish mechanisms for public participation.	See details in section 2.3.12 of Part II.	
		Action 30. To promote establishment of partnerships for biodiversity conservation.	Effective biodiversity partnerships have been established at national and provincial levels (see details in Action 3), however partnerships between relevant international organizations, local communities and NGOs are yet to be strengthened.	

Annex II. Assessment of China's Progress in Implementing the Strategic Plan for Biodiversity 2011-2020 and the 2020 Biodiversity Targets

Note: Overall assessment using national indicators: ✓ Improving; ≈ little or no change; ✗ worsening ; ••• no adequate data

Strategic Goals	Global Targets	National Targets	National Actions	Outcomes Achieved	National Indicators	Overall Assessment and Trends
A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	***Target 1:*** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	Practical efforts will be made in environmental education and communication, popularizing environmental knowledge and increasing public environmental awareness. By 2030, biodiversity conservation will become voluntary action of the public.	• Lecturing on biodiversity-related knowledge provided in primary and middle school classrooms. • Providing biodiversity-related professional education in universities. • Biodiversity communication and education undertaken by using media such as TV, internet, newspapers and radios, and through organizing training workshops and disseminating training materials.	Biodiversity-related knowledge has been incorporated into classroom teaching in primary and middle schools in China. By 2012, 1,908 universities in China have trained 556,000 professionals in the field of biodiversity. To celebrate the International Year of Biodiversity, 40 large-scale communication and education activities were organized at national level and more than 370,000 copies of educational materials were disseminated, with 800 million persons/times influenced by various media. 191 large-scale activities were organized at local levels and more than 350,000 copies of materials disseminated. 25 films with biodiversity themes were developed. About 20,000 institutions, including protected areas, zoos, botanical gardens, environmental education organizations and research institutes as well as media such as TV, newspapers and internet were mobilized to provide a series of communication activities for the public and primary and middle school and university students, whose number came up to 100 million persons/times. Through communication and education, public awareness and participation have increased significantly, and the importance of biodiversity widely recognized.	Items concerning biodiversity in China searched through Google or Baidu in different years	✓ Upward trend

	Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	Resource consumption, environmental damage and ecological benefits will be incorporated into the system of assessing social and economic development, and a system of goals, assessment methods and reward/penalty mechanisms that meet requirements for building an ecological civilization, will be established.	● Establishing theory and methods for the evaluation of the economic values of biodiversity. ● Case studies undertaken in the evaluation of the economic values of biodiversity. ● Developing a system of goal setting, assessment methods and reward/penalty mechanisms that meet requirements for building an ecological civilization.	China has issued technical guidelines for assessing the economic values of genetic resources, and is developing technical guidelines for assessing ecosystem services and functions. In 1998 China completed the national assessment of the economic values of biodiversity. In 2010 China completed a national assessment of service of forest ecosystems. China has also undertaken assessments of biodiversity values in some typical regions in different periods of time. All these assessments have provided a basis for developing theories and methods for economic evaluation of biodiversity. The Eighteenth National Congress of the Chinese Communist Party held in November 2012 laid out a vision for building an ecological civilization and Beautiful China. The meeting required that national policy of protecting the environment and improving resource use efficiency would continue to be followed, and proposed that priorities would be given to energy conservation, protection and natural recovery of the environment. Future efforts will focus on promoting green, cycling and low carbon development so as to form the industrial structure, production and consumption patterns and spatial layouts favorable to the environment and conservation of natural resources. China is developing a system of goals, assessment methods and reward/penalty mechanisms that meet requirements of an ecological civilization. The biodiversity values will be incorporated into such system of goals and assessment methods.	No	
	Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the	Establishment of mechanisms for ecological compensation and increase fiscal transfers to key ecological function zones will be accelerated; and studies will be undertaken on the establishment of national specialized funds for ecological	● Eliminated rebates for exports of 553 products with high energy consumption, pollution and resource consumption. ● 30 provinces (autonomous regions, province-level municipalities) have required	(1) The project of returning cultivated land to forests has been implemented since 1999. By 2012, the cumulative investment by the central government has reached 324.7 billion yuan RMB, providing direct benefits to 120 million farmers in 2,279 counties with each household receiving a policy subsidy of 7,000 yuan cumulatively. (2) In 2000 the Government of China initiated the natural forest resources protection project in 17 provinces, with the central government providing subsidies for forest conservation and management, reforestation and social expenditures. By the end of 2010, the cumulative investment for the first phase of the project has reached 118.6 billion yuan RMB and the investment for the second phase will total 244 billion yuan RMB. (3) The project of returning grazing land to grasslands was	Investments in key forestry projects	 Investments into natural forest resources protection, wild flora and fauna protection, establishment and management of PAs and wetland

	conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	compensation and the system of reserves for sustainable development of resource-efficient enterprises will be promoted.	mining operators to deposit funds for environmental and ecological recovery in mining areas, with cumulative funds having reached 61.2 billion yuan RMB. ● Subsidies provided to key forestry and ecological conservation projects. ● Established funds for compensation for forest ecological benefits. ● Preliminarily established ecological compensation mechanisms for national key ecological function zones.	initiated in 2003 and implemented in 8 provinces, with the central government providing subsidies for setting up fences and supply of forages. The cumulative investment for this project during 2003-2012 has reached 17.57 billion yuan RMB, benefiting more than 4.5 million farmers and herdsmen in 174 counties. (4) China established in 2004 the National Fund for Compensation for Forest Ecological Benefits, with annual payment reaching 3 billion yuan RMB. (5) In 2008 China established funds to be transferred from the central government budget to national key ecological function zones. In 2013 the funds transferred covered 492 counties and 1,367 land zones prohibited for development, with the total funds transferred reaching 42.3 billion yuan RMB. (6) Since 2006, through provision of fiscal subsidies for wetland conservation as proposed in the Eleventh and Twelfth Five-year Plans for Wetland Conservation Project, more than 500 wetlands have been protected and restored, with an area of over 3,000 km^2 of protected wetlands added annually.		conservation increased from 9.7 billion yuan in 2001 to 21.77 billion in 2011, with average annual increase by 13.9%.
	Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken	By 2015 considerable progress will be made in building a resource-efficient and environmentally friendly society.	● Significant reductions in total amount of main pollutants identified as one of binding targets for social and economic development and	(1) Since 2006, COD discharged from industrial waste water, SO_2 emitted from effluent gas, soot, industrial dust and solid wastes have been going down. In the past decade, the intensity of pollutant emissions per unit of GDP dropped significantly by more than 55%. Since 2004 the intensity of CO_2 emission per unit of GDP dropped by 15.2%. (2) China has been strictly implementing rules for EIA and measures have been taken such as 'limited approvals for certain regions and sectors'. Since 2008, the central	Reduction in pollutant emission	 Reduced overall however wastewater discharging still increasing.

	steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	Efforts will be made to promote spatial layouts, industrial structure, production and consumption patterns characterized by green, recycling and low-carbon development, conserving natural resources and protecting the environment.	pollution reduction projects implemented. ● EIA rules strictly implemented.	government has refused to approve 332 projects with a total investment of 1.1 trillion yuan RMB, all of which were projects of high pollution, energy consumption, resource use, low-level duplication and exceeding production capacities. These measures have played an important role in adjusting industrial structure and prioritizing economic growth.	Pollutant emission per unit of GDP	✓ Down by over 55% in the past decade.
					CO_2 emission per unit of GDP	✓ Down by 15.2% since 2004.
					Sustainable consumption	•••
B. Reduce the direct pressures on biodiversity and promote sustainable use	***Target 5:*** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	By 2015, forest coverage rate will be increased to 21.66% and forest reserves will be increased by 600 million m^3 over that in 2010. By 2020, grassland degradation trend will be basically controlled and grassland ecological environment will be obviously improved. By 2020, the environmental and ecological worsening trends in coastal and	● Implemented key forestry and ecological projects. ● Great efforts made in comprehensive control of soil erosion. ● Undertaken conservation and restoration of grassland ecosystems. ● Undertaken conservation and restoration of wetlands. ● Undertaken restoration and rebuilding of coastal wetlands.	(1) China's forest resources have increased constantly and rapidly since key forestry projects were initiated. China has completed reforestation in areas of 482,000 km^2, an increase in forest areas by 23% over those a decade ago. The forest coverage rate is 3.8% up over that of a decade ago. The forest reserves are 21.8% higher. All this has enhanced restoration of habitats for wild species and the increase in the number and variety of species. During 2004-2009, areas of land degradation across the country have been reduced by 1,717 km^2 and areas of intermediately, seriously and extremely seriously degraded land reduced by 35,900 km^2 in total during these five years, resulting in reductions in annual input of yellow sands by over 300 million tons. (2) Great efforts were made in soil erosion control in some key regions. During 2009-2012 such projects were implemented in a total of 12,000 small river basins, with areas of soil erosion control reaching 270,000 km^2. Enclosing mountains for conservation and soil erosion control continues, with cumulative areas enclosed for conservation having reached 720,000 km^2, and among them ecological conditions in areas of 450,000 km^2 have begun to recover. (3) Remarkable achievements have been made in conservation and restoration of grassland ecosystems. Compared with areas without such projects implemented, vegetation coverage of	Total growing stock volume	✓ 10.57billion m^3 in 1988, 13.62 billion m^3 in 2003, and 14.55billion m^3 currently.
					Area of natural forests	✓ 885,000 km^2 in 1988, 1.158 million km^2 in 2003, and currently 1.197 million km^2
					Area of wetland ecosystems	✓ Increased during 2000-2010

		near-shore areas will be fundamentally reversed and marine biodiversity decline trend will be basically contained. By 2020, aquatic environment and ecology will be gradually restored and decline of fishery resources and increase in endangered species will be basically contained.		grasslands in project areas increased by 11%, grass height increased by 43.1%, and fresh grass output increased by 50.7%. The situation of grassland use is considerably improving, with the rate of overcapacity use of grasslands in 268 counties in 2012 down by 34.5%-36.2% compared with the situation in 2011. However overall most of grasslands are being used beyond their capacities and degradation, desertification and salinization of grasslands have not been effectively controlled. (4) In recent years, areas of wetland conservation added annually have exceeded 3,000 km^2 and areas of wetlands restored nearly 200 km^2. The rate of protection of natural wetlands increased by over 1% annually, with more than half of natural wetlands effectively protected.	Area of grassland ecosystems	 Decreased during 2000-2010
					Grass output from natural grasslands	 Annual increase by 1.6% during 2005-2012.
					Area of desertified land	 Annual reduction in areas of degraded land by 1,717 km^2 across the country
					Ecological degradation	
	Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery	By 2020, aquatic environment and ecology will be gradually restored and decline of fishery resources and increase in endangered species will be basically contained. By 2020, the environmental and ecological worsening trends in	● Undertaken conservation and restoration of wetlands. ● Undertaken restoration and rebuilding of coastal wetlands. ● Increased restocking of aquatic biological resources. ● Strengthened construction of	(1) China has strengthened establishment and management of PAs for aquatic species. More than 200 PAs have been established for conserving various kinds of aquatic wild flora and fauna and types of aquatic ecosystems. (2) China has strengthened establishment of PAs for aquatic germplasm by identifying 368 national-level PAs to protect more than 300 national protected aquatic plants and animals with economic values as well as local rare, endemic aquatic species and their habitats and reproduction sites. (3) China has implemented many projects to protect and restore wetlands. The rate of natural wetland protection has increased by over 1% annually. However studies on fishery impacts on biodiversity are yet to be undertaken.	Marine trophic index	 Constantly increased since 1997, however still at low level .
					Red List Index of fishes	 RLI of fresh water fish down during 1998-2004.

	plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	coastal and near-shore areas will be fundamentally reversed and marine biodiversity decline trend will be basically contained.	marine farms.		Fishery impacts on biodiversity	
	Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	By 2020, national forest holdings will exceed 2.33 million km^2, an increase 223,000 km^2 over that of 2010; and national forest reserves will be increased to 15 billion m^3, an increase of about 1.2 billion m^3 over that of 2010. By 2020,	● Provided subsidies to appropriate fertilizer use based on land size. ● Undertaken eco-farming and established counties for demonstration in use of new rural energy. ● Promoted development of	(1) A project to subsidize soil testing and formula development for proper fertilizer use has been initiated to address problems of overuse and blind use of fertilizers and low efficiency rate of fertilizer use. Through the project implementation China has basically obtained information concerning soil nutrients and fertilizer needs for main crops in all counties so as to develop a plan for reasonable fertilizer use and popularize techniques for proper fertilizer use, which is important for increasing food production, saving costs and controlling pollution. (2) Eco-farming initiatives and demonstration projects for rural new energy were undertaken to enhance capacities for sustainable agricultural development, with focus on reuse of straw, use of biogas and solar energy in rural areas and establishment of eco-farming bases, with a view to increasing	Total growing stock volume	 10.57billion m^3 in 1988, 13.62 billion m^3 in 2003, and 14.55 billion m^3 currently.
					Grass output from natural grasslands	 Annual increase by 1.6% during 2005-2012.

		husbandry production pattern will be changed and grassland sustainability will be effectively enhanced. By 2020, fishing capacities and outputs will be corresponding with carrying capacities of fishery resources.	organic farming. ● Established eco-provinces, cities and counties. ● Implemented natural forest resources protection projects. ● Strengthened grassland ecosystem conservation and restoration.	eco-farming efficiency and farmers' income and improving the rural environment. So far more than 41 million rural households have used biogas and more than 150 million people benefited from this. (3) China has actively promoted development of organic farming. By 2012, China has had 20,000 km^2 of land for eco-farming, ranking top in Asia. (4) 15 provinces (autonomous regions, province-level municipalities) have started their eco-province initiatives and 13 provinces have issued their programmes for eco-province building and more than 1,000 counties (cities, districts) have begun their eco-county development. Since 2005, 38 counties have been awarded as national-level eco-counties, and 1,559 eco-towns and 238 eco-villages have been established. (5) Since the natural forest protection project was implemented, logging has been reduced by 220 million m^3, and forest areas net increased by 100,000 km^2, forest coverage rate up by 3.8% and forest reserves increased by 725 million m^3. (6) Projects such as returning grazing land to grasslands were implemented. Compared with areas without such projects implemented, vegetation coverage of grasslands in project areas increased by 11%, grass height increased by 43.1%, fresh grass output increased by 50.7%. The situation of grassland use has considerably improved.	Impacts of agriculture, forestry and fishery on biodiversity	
	Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	By 2015 the total amount of emission of main pollutants will be significantly reduced, with COD and SO_2 reduced by 8%, and ammonia and NOx reduced by 10% compared with the levels of 2010. By 2020, energy	● Significant reductions in total amount of main pollutants identified as one of binding targets for social and economic development and pollution reduction projects implemented. ● EIA rules strictly	(1) Since 2006, emissions of COD from industrial waste water, SO_2 from effluent gas, soot, industrial dust and solid wastes have been going down. In the past decade, the intensity of pollutant emissions per unit of GDP dropped significantly by more than 55%. Since 2004 the intensity of CO_2 emission per unit of GDP dropped by 15.2%. (2) China has been implementing measures such as 'limited approvals for certain regions and sectors'. Since 2008, the central government has refused to approve 332 projects with a total investment of 1.1 trillion yuan RMB, all of which were projects of high pollution, energy consumption, resource use, low-level duplication and exceeding production capacities. These measures have played an important role in adjusting industrial structure and prioritizing economic growth.	Reduction in pollutant emissions	 Overall reduction however wastewater discharging still increasing
					Pollutant emission per unit of GDP	 Down by more than 55% in the past decade

		consumption and CO_2 emission per unit of GDP will decline significantly, with the total amount of main pollutants considerably reduced.	implemented. ● Undertaken control and comprehensive reuse of wastes.	(3) National capacities of flue-gas desulfurizaton (FGD) units and percentage out of total thermal power capacities, the rate of treatment of municipal wastewater, and the rate of comprehensive reuse of industrial solid wastes have been increasing substantially however the total amount of pollutant emission is still high and the rate of reuse of industrial solid wastes going down slightly in the past two years.	CO_2 emission per unit of GDP	✓ Down by 15.2% since 2004
					Percentage of FGD unit capacities out of total thermal power capacities	✓ Increased from 48% in 2007 to 92% in 2012, with annual increase of 14% on the average
					Rate of municipal wastewater treatment	✓ Increased from 45.6% in 2004 to 82.3% in 2010, with annual increase of 10.4% on the average.
					Rate of comprehensive use of industrial wastes	✓ Annual increase by 2.2% since 2004.
	Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place	By 2020, forest pest disaster rate will be controlled at 4%.	● Preliminarily identified a list of IASs for priority control. ● Strengthened capacities for monitoring and early warning. ● Undertaken activities to eliminate IASs.	(1) China has established a cross-sectoral coordinating group on prevention and control of IAS. 18 provinces (autonomous regions or province-level municipalities) have set up offices for IAS management or established joint conference mechanisms. China has developed guidelines for emergency responses to 40 major IASs, issued a second list of IAS and identified IAS for priority control. (2) China has improved its system of inspection and quarantine of imported and exported plants, established a network of monitoring and early warning of forest pests and agricultural IAS.	Species of IAS newly found every twenty years	✗ Number of new IAS increasing, with the total of 212 IASs entering China within 60 years after the

	to manage pathways to prevent their introduction and establishment.		• Strengthened studies on prevention and control techniques. • Undertaken communication and education.	(3) China has undertaken activities eliminating some 20 IASs such as ragweed, which has effectively controlled the expansion of IASs. (4) China has undertaken demonstration projects in surveying IAS and preventing and controlling IAS. (5) China has undertaken communication and education concerning techniques for preventing, controlling and managing IAS by using radios, TV, newspapers and internet. However the trend of increase in the number of IAS has not been effectively contained and the damages caused by IAS are being aggravated.		1950's accounting for 53.5% of the total IASs in China.
	Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	By 2020, energy consumption and CO_2 emission per unit of GDP will decline significantly. By 2020, a system of nature reserves with reasonable layouts and comprehensive functions will be established, with functions of national-level nature reserves stable, and main targets of protection effectively protected.	• Adjusted industrial structure to enhance pollution abatement. • Implemented key forestry projects to protect vulnerable ecosystems. • Strengthened establishment and management of PAs and improved system of *in-situ* conservation.	(1) The Government of China identified significant reductions in the total amount of main pollutants as one of binding targets for social and economic development. During 2000-2010, the concentration of main pollutants went down overall. In the past decade the density of pollutant emission per unit of GDP dropped by more than 55%. The density of CO_2 emission per unit of GDP has dropped by 15.2% since 2004. (2) China has implemented key forestry projects resulting in rapid growth in forest resources. The forest area has increased by 23% over that of a decade ago, and the forest coverage rate 3.8% upper over a decade ago. The forest growing sotck also grew by 21.8%. All this has effectively protected vulnerable ecosystems. (3) China has established a system of conservation consisting primarily of nature reserves and complemented by scenic spots, forest parks, community-based conservation areas, protected sites of wild flora, wetland parks, geological parks, special marine protected areas and protected areas for germplasm resources. By the end of 2013, China has established 2,697 nature reserves of various types at different levels, covering areas of 1.463 million km^2 and accounting for 14.8% of the country's land area.	Pollutant emission per unit of GDP	✓ Down by more than 55% in the past decade
					CO_2 emission per unit of GDP	✓ Down by 15.2% since 2004
					Forest growing stock in areas where natural forest protection or returning cultivated land to forests are implemented	✓ Constantly increasing
					Soil erosion in areas where natural forest protection or returning cultivated land to forests are implemented	✓ Down in overall trend
					Biodiversity of coral reefs	•••

					Climate change impacts on biodiversity	
C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	***Target 11:*** By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	By 2015, the total area of terrestrial nature reserves will be maintained at 15% or so of the country's land area, protecting 90% of national key protected species and typical ecosystem types. The percentage of the area of marine protected areas out of the marine areas under China's jurisdiction will be increased from 1.1% in 2010 to 3% in 2015. By 2020, a system of nature reserves with reasonable layouts and comprehensive functions will be established, with functions of national-level nature reserves stable, and main targets of protection effectively protected.	● Strengthened *in-situ* conservation mainly through PAs. ● Implemented fishing bans in the marine areas, the Yangtse River and the Pearl River to protect aquatic biodiversity.	(1) China has established a system of conservation consisting primarily of nature reserves and complemented by scenic spots, forest parks, community-based conservation areas, protected sites of wild flora, wetland parks, geological parks, special marine protected areas and protected areas for germplasm resources. By the end of 2013, China has established 2,697 nature reserves of various types at different levels, covering areas of 1.463 million km^2 and accounting for 14.8% of the country's land area. Among PAs there are more than 240 marine PAs. By the end of 2012, China has established 2,855 forest parks, with total areas planned covering 174,000 km^2. China has also established 225 scenic spots covering area of 104,000 km^2, and more than 50,000 community-based conservation areas, covering an area of over 15,000 km^2. China has set up 179 national-level protected sites for wild flora and 468 national-level wetland parks. 368 national-level protected areas for aquatic germplasm resources have been established, covering areas of more than 152,000 km^2. However the representativeness and management effectiveness of PAs are yet to be improved, and the number and area of marine PAs are still low. (2) Since 1995 marine summer fishing bans have been implemented in the Bo Sea, Yellow Sea, East China Sea and South China Sea north of northern latitude 12^0 for about three months. Since 2002 such a ban implemented in the Yangtse River, and in the Pearl River since 2011, also for three months. The implementation of fishing bans or breaks has strongly helped replenishment of fishery resources and protected aquatic biodiversity.	Number of PAs	 606 PAs in 1990, 1,227 PAs in 2000 and 2,697 PAs in 2013, with annual increase of about 8.9% on the average.
					Percentage of PA area of the country's total land area	 4% in 1990, 9.9% in 2000 and 14.9% in 2012, with annual increase of 8.1% on the average.
					Ecological representativen-ess of PAs	
					Management effectiveness of PAs	

	Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	By 2015, more than 80% of endangered species whose wild populations are very small and for which *in-situ* conservation capacities are inadequate will be effectively protected. By 2020 functions of national-level nature reserves will be maintained stable, and main targets of protection effectively protected. By 2020, the majority of rare and endangered species and populations will be restored and reproduced, relieving the situation of species endangerment.	● Strengthened establishment and management of PAs. ● Undertaking *ex-situ* conservation reasonably. ● Strengthened research on endangered species. ● Promoting international cooperation. ● Undertaking public education.	(1)For information concerning establishment and management of PAs please see details in Target 11. (2) China has established 200 botanical gardens of various kinds at different levels that have collected and stored 20,000 species, accounting for the two-thirds of China's flora. China has also established more than 240 zoos, and 250 breeding bases for rescuing and reproducing wild animals. These *ex-situ* conservation facilities have played important roles in protecting endangered species. (3) For information concerning scientific research and international cooperation please see details in Target 19. (4) For information concerning public education please see details in Target 1.	Red List Index	⊗ RLI of fresh water fish down during 1998-2004; RLI of mammals down during 1996-2008; RLI of birds slightly down during 1988-2012.
	Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals	By 2020, biodiversity loss will be basically contained, and a system of nature reserves with reasonable layouts	● Developed and implemented plans for protection of genetic resources. ● Established	(1)China has developed and issued strategies related to genetic resources, including National Programme for Conservation and Use of Biological Resources and National 12th Five-year Plan for Conservation and Use of Livestock Genetic Resources. (2) China has established 179 national-level protected sites for wild plants and 368 national-level protected areas of aquatic	Number of local varieties	⊗ Trend of loss of GRs not yet effectively contained,

	and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	and comprehensive functions will be established, with main targets of protection effectively protected. National List of Protection of Livestock Genetic Resources will be revised so as to accord key protection to rare and endangered livestock genetic resources in the list and ensure that protected varieties will not be lost and their economic values will not be decreased.	*in-situ* conservation sites for genetic resources. ● Established storage banks for genetic resources, and undertaken studies on collection, storage and use of GRs.	germplasms, protecting a group of rare genetic resources. (3) China has established a system of storing crops genetic resources, with 423,000 accessions of crop GR stored. China has also established 150 national livestock seed conservation farms, protected areas and gene banks, effectively protecting more than 100 key livestock resources. China has set up germplasm banks for marine biological resources, such as a big germplasm bank for seaweed and a centre for storage of marine micro-organisms. Though China has done tremendous work in protecting genetic resources, the trend of loss of GRs has not been effectively contained.		according to estimates
D: Enhance the benefits to all from biodiversity and ecosystem services	***Target 14:*** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are	By 2020, the stability of ecosystems will be strengthened, and the human environment will be considerably improved. By 2020, grass-herd balance will be	● Strengthened establishment and management of PAs ● Implemented key forestry and ecological projects. ● Undertaken conservation and restoration of grassland	(1)For information concerning establishment and management of PAs please see details in Target 11. (2)For information restoration of forest, grassland and wetland ecosystems, please see details in Target 5. (3) As a result of national actions in conserving and restoring biodiversity, well-being of those communities that depend directly on local ecosystem goods and services is also improving. Forest growing stock have constantly been increasing since 1999 in those sample counties and enterprises where projects for protection of natural forest resources, returning cultivated land to forests and controlling areas of origin of sandstorms affecting Beijing and Tianjin have been	Net income per capita of rural households	✓ Constantly increasing
					Number of poor people in key ecological project areas	✓ Constantly decreasing
					Forest growing stock	✓ Constantly increasing since 1999

	restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	achieved in natural grasslands, grassland habitats will be obviously restored and grassland productivity will be significantly enhanced. By 2020, the environmental degradation of the coastal and near-shore marine areas will be reversed, and decline of marine biodiversity will be basically contained.	ecosystems. ● Undertaken conservation and restoration of wetlands. ● Undertaken restoration and rebuilding of coastal wetlands.	implemented. Areas of soil erosion in these counties are also going down and net income per capita of rural households is going up rapidly, an increase of 40.8% in 2011 over that of 2000. This has benefited to some extent from increase in the functions of ecosystems to provide more goods and services. The number of poor people living in these areas is going down constantly, with the poor population in areas where natural forest protection implemented decreased to 1.83 million in 2011 from 3.95 million in 1997, and those in areas where returning cultivated land to forests implemented dropped from 8.3 million in 1998 to 5.7 million in 2008.	Areas of soil erosion in key ecological project areas	Constantly decreasing
	Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change	By 2020, forest areas will be increased by 52,000 km^2 over that in 2010, and forest growing stock net increased by 1.1 billion m^3 over that in 2010, and forest carbon sinks by 416 million tons. By 2020, the total areas of control of degraded grasslands will exceed 1.65	● Implemented key forestry and ecological projects. ● Undertaken conservation and restoration of grassland ecosystems. ● Undertaken conservation and restoration of wetlands. ● Undertaken restoration and rebuilding of coastal wetlands.	For information restoration of forest, grassland and wetland ecosystems, please see details in Target 5.	Forest growing stock	Constantly increasing since 1999
					Areas of soil erosion in key ecological project areas	Constantly decreasing

	mitigation and adaptation and to combating desertification.	million km^2, with grassland habitats obviously restored and grassland productivity significantly enhanced. By 2020, the aquatic environment and ecology will be gradually restored.				
	Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	By 2020, the system of access to genetic resources and benefit-sharing from their use will be improved.	● Promoted development of regulation on access to genetic resources and benefit-sharing. ● Support provided to studies on mechanisms for access to genetic resources and benefit-sharing.	With the support of relevant research plans China has strengthened information collection concerning access to genetic resources and benefit-sharing as well as studies on ABS mechanisms. China is currently promoting development of a regulation on ABS and ratification of the Nagoya Protocol on ABS.	No	
E. Enhance implementation through participatory planning, knowledge management and capacity	***Target 17:*** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and	Updated NBSAP has been launched.	● Implementing updated NBSAP (2011-2030) ● Provinces or cities developing their local BSAPs.	The updated NBSAP (2011-2030) was approved by the State Council at its 126th regular meeting on 15 September 2010. The updated NBSAP was officially launched by MEP on 17 September 2010. This updated NBSAP reflects wide representativeness and participation and is a result of joint efforts of all members of China's Coordinating Group on Implementation of the CBD and members sitting on the Inter-ministerial Joint Conference on Conservation of Biological Resources. It was also an example for cooperation between domestic and international institutions/organizations. All the provinces (autonomous regions, province-level	Implementation of policies and programmes	

building	updated national biodiversity strategy and action plan.			municipalities) are developing their local BSAPs, with 7 provinces having issued their BSAPs so far.		
	Target 18 : By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	By 2020, documentation of relevant traditional knowledge within China and the intellectual rights protection system will be further improved.	● Established relevant projects to compile and document traditional knowledge and to study system for intellectual property rights protection.	The Government of China respects traditional knowledge and practice that people of various ethnicities have passed down from generation to generation. Relevant projects have been established to compile and document traditional knowledge and support provided to studies on the system of intellectual property rights protection.	No	

	Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	By 2020, the percentage of investment in research and development activities will exceed 2.5% of national GDP, with the rate of contributions from science and technology to GDP reaching 60%, and the number of annual patent grants to domestic applicants and the citation of scientific papers by international journals ranking top five in the world. Environmental education will be undertaken to popularize environmental knowledge and increase public environmental awareness.	● Promoted scientific and technical research in the conservation and sustainable use of biodiversity. ● Promoted international cooperation in the field of biodiversity conservation. ● Great efforts made in communication and educational activities.	(1)The Government of China encourages and supports scientific and technical research in the conservation and sustainable use of biodiversity. Projects for conservation and sustainable use of biodiversity have been included in the National Plan for Support to Science and Technology, National Programme for Development of Key Fundamental Research, National High-tech Development Plan, and specialized plans of National Natural Sciences Fund and support to public-benefit sectors. All these research activities have produced a series of valuable and influential research achievements, providing scientific and technical support to biodiversity conservation in China (see details in Section 3.3 of Part III). (2) China has actively explored multilateral, bilateral and South-South cooperation and accomplished good results. China has been actively participating in negotiations related to CBD, seriously implementing its obligations under the CBD and actively involved in the construction of the related multilateral systems. China has established with over 50 countries channels of cooperation and exchanges, creating a multiple cooperation system composed primarily of cooperation between Governments. China has actively undertaken South-South cooperation in the field of biodiversity and signed agreements of cooperation with many developing countries in the field of biodiversity and related areas. (3) China has made great efforts in undertaking biodiversity communication and education. As a result of these efforts, the public participation has increased and the public awareness of biodiversity conservation obviously increased, with the importance of biodiversity widely recognized (see details in Target 1).	Academic papers on biodiversity published in different years.	✓ Gradually increasing year by year
					Items concerning biodiversity in China searched through Google or Baidu in different years	✓ See details in Target 1.
	Target 20: By 2020, at the latest, the mobilization of financial resources for effectively	Channels of investment will be broadened and investments from local and central governments will be increased and	● Significantly increased domestic investments. ● Provided as much assistance as China can to	China has made huge investments into biodiversity conservation and details can be seen in Target 3. China has provided as much assistance as it can to some developing countries.	Investment in key forestry projects	✓ See details in Target 3

	implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	financing from the banking sector, international donors and the civil society will be attracted to biodiversity conservation, with diversity of financing mechanisms established.	some developing countries.			

Note: Overall assessment of national indicators: Improving; little or no change; worsening; no adequate data.

Annex III. Implementation of the Programme of Work on Biodiversity of Arid and Semi-arid Lands

Global targets, sub-targets and activities	National Targets	National Actions	Outcomes Achieved	Global or national indicators used	Overall assessment
See details on the website of the Convention on Biological Diversity	By 2020, more than half of controllable desertified land across the country will be controlled, with desert ecology obviously improved, and an area of 200,000 km^2 of deserts controlled, with one half to be completed during 2011-2015 and another half during 2016-2020. (National Plan for Desertification Prevention and Control 2011-2020)	**(1) Improved policies to support desertification prevention and control.** China has developed and implemented a series of policies and measures to support ecology conservation and industry development in deserts, including reform in collective forest ownership, compensation for forest ecological benefits, and subsidies for forestry loans, reforestation and grassland ecology conservation. **(2) Implemented key projects on desertification prevention and control.** China continues implementing a series of key ecological projects, such as controlling areas of origin of sandstorms affecting Beijing and Tianjin, construction of forest belts in north, northwest and northeast China, returning cultivated land to forests and grazing land to grasslands, grassland conservation and comprehensive control in small river basins. China has also initiated a number of projects on regional desertification prevention and sand control such as those projects in Talimu Basin and Shiyanghe River Basin of Xinjiang and building ecological barriers in Tibet. These projects are intended to control key desertified areas and enhance ecological improvements in land degraded or desertified lands across the country. **(3) Enhanced support to capacities for desertification prevention and control.** One measure is to enhance scientific and technical capacities. SFA has established a research institute on desertification to strengthen scientific and technical support in this regard. Some research results such as "research on evolution of desertification and models of comprehensive control", and "studies on desertification processes in north China and prevention" have won national awards for scientific and technological progress. Some research results and applicable techniques are being promoted in wider areas. Another measure is to develop and improve relevant technical standards. A number of technical standards for desertification prevention and control have been developed and issued, such as Technical Guidelines for Desertification Prevention and Control, Technical Guidelines for Monitoring Land Degradation and Desertification and technical standards for controlling areas of origin of sandstorms affecting Beijing and Tianjin. The third measure is to strengthen monitoring of land degradation and desertification and emergency responses to sandstorms. The fourth national monitoring of land degradation has been completed and a system of emergency responses to major sandstorms has been established. A monitoring system of sandstorms is also in place, with main support from remote-sensing and on-the-ground monitoring, complemented by informers on the ground. **(4) Strengthened inter-sectoral coordination mechanisms for desertification prevention and control.** From the central government to local governments, China has established specialized coordination and leading bodies for desertification prevention and control to strengthen the organization, leadership and coordination of desertification	The monitoring results show that during the 11th five-year plan period (2006-2010) the average area of desertification is reduced by 1,717 km^2 annually. The total reduction within five years in areas of severely, medium and extremely severely desertified land is 36,000 km^2. This is an indication that desertification level is going down. Soil erosion in some areas has been effectively controlled. The soil erosion modulus is significantly reduced, with annual erosion of yellow sand cut by more than 300 million tons every year. For example in areas of origin of sandstorms affecting Beijing and Tianjin, according to expert estimate, since the project was initiated a decade ago, the soil erosion modulus in	Percentage and change in areas of desert ecosystems	 Improv-ing

		prevention and control. **(5) Implemented the responsibility system for achieving targets for desertification prevention and control.** In accordance with requirements contained in the Desertification Prevention and Control Law, during the eleventh five-year plan period, SFA on behalf of the State Council has signed agreements of accountability for achieving the targets for desertification prevention and control with 12 provincial governments of north China and Xinjiang Production Corp. The establishment and implementation of such responsibility system for the first time makes provincial governments accountable for achieving targets for desertification prevention and control, and helps local governments of different levels upgrade their sense of responsibility for desertification prevention and control, and promote work in this regard across the country. **(6) Encouraging industry development unique to desert areas.** To promote industry development unique to desert areas, SFA has developed recommendations for further developing industry in desert areas, which require governments of levels to promote industry development in accordance with local conditions, with a view to improve local farmers' income and promote economic development in desert areas.	the project area went down by 68.9% on the average, with areas affected by soil erosion down by 39.1%, and the total soil erosion amount down by 29% and the total amount of dust release down by 16.2%.		

Annex IV. Implementation of the Programme of Work on Protected Areas

The draft reporting framework facilitates capturing the progress in completing assessments on 13 key goals of the programme of work on protected areas and specific actions taken to implement the results of those assessments, in order to indicate the status of implementation. Progress in completing these assessments is measured from 0-4 (0 – no progress; 1 – planning phase; 2 – initial progress; 3 – substantial progress; 4 – nearly or fully completed). The framework allows Parties to append the results of these assessments, and to optionally describe specific actions taken in three time lines (before 2004; between 2004-2009; and since 2010). If a question is not applicable, the letters N/A should be entered. The PoWPA focal points could upload the information on the CBD website as and when they have undertaken and completed the assessment or following the reporting cycle of national reporting through a user ID and password.

COUNTRY:	**The People's Republic of China**
Name of person completing survey:	
Email address of person completing survey:	
Date survey completed:	**(DATE)**
Please briefly describe who was involved in gathering information for this survey	**(NAMES AND ORGANIZATIONS)**

1) Has a multi-stakeholder advisory committee been formed to implement the PoWPA?	**YES**
2) Is there an action plan for implementing the PoWPA?	**YES**
3) If yes, please provide a URL (or attach a pdf) of the strategic action plan:	**http://www.zhb.gov.cn/gkml/hbb/bwj/201009/t20100921_194841.htm**
4) If yes, which is the lead agency responsible for implementing the action plan?	**The Ministry of Environmental Protection**
5) If not, are the PoWPA actions included in other biodiversity-related action plans? (please provide a URL or attachment if so)	

1.1 To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals

1) What progress has been made in assessing the representativeness, comprehensiveness and ecological gaps of your protected area network?	**3**
2) If available, please indicate the URL (or attach a pdf) of the gap assessment report:	**(URL OR ATTACHMENT)**
3) Do you have specific targets and indicators for the protected area system?	**YES**
4) If yes, please provide a URL (or attach a pdf) of the targets and indicators:	**http://www.zhb.gov.cn/gkml/hbb/bwj/201009/t20100921_194841.htm**

5) What actions have been taken to improve the ecological representativeness of the protected area network? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Created new protected area/s	√	√	√
	Promoted an array of different types of protected areas (e.g., different IUCN Categories, CCAs etc)			
	Expanded and/or reconfigured existing protected area boundaries	√	√	√
	Changed the legal status and/or governance type of protected area/s	√	√	√
	Other actions to improve the representativeness and comprehensiveness of the network	√	√	√

To improve the network of protected areas and their ecological representativeness, China had developed national plans for development of protected areas in different periods of time, which identified goals and requirements for spatial layouts, establishment and management of protected areas. Before 2004, China had a total of 1,999 protected areas of various categories and at different levels, with total areas covered by PAs reaching 1.44 million km^2, accounting for about 14.4% of the country's total land area. Among them there were 226 national-level PAs. During 2004-2009, China established 542 new PAs, 93 of which were national-level PAs. From 2010 to the end of June 2013, China has established 128 more PAs, 65 of which are national-level PAs, with total area accounting for 14.9% of the country's total land area.

1.2 To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function

1) What progress has been made in assessing protected area landscape and seascape connectivity and sectoral integration?	**3**
2) If available, please indicate the URL (or attach a pdf) of the assessment of protected area connectivity and sectoral integration:	

3) What actions have been taken to improve protected area connectivity and sectoral integration? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Changed the legal status and/or governance in key connectivity areas	√	√	√
	Created new protected areas in key connectivity areas	√	√	√
	Improved natural resource management to improve connectivity	√	√	√
	Designated connectivity corridors and/or buffers	√	√	√
	Created market incentives to promote connectivity	√	√	√
	Changed awareness of key stakeholders in key connectivity areas	√	√	√
	Improved laws and policies within or around key connectivity areas	√	√	√
	Restored degraded areas in key connectivity areas	√	√	√
	Changed land use planning, zoning and/or buffers in key connectivity areas	√	√	√
	Removed barriers to connectivity and ecological functioning	√	√	√
	Integrated protected areas into poverty reduction strategies	√	√	√
	Other actions to improve connectivity and integration	√	√	√

To improve the network of protected areas and their ecological representativeness, China had developed national plans for development of protected areas in different periods of time, which identified requirements for spatial layouts of PAs and establishment of ecological corridors. These requirements have been incorporated into relevant sectoral development plans. For example, to implement the national plan for wild flora and fauna protection and protected areas, since 2006 China has invested 2.6 billion yuan into establishment and management of PAs. China has also implemented a project to protect Giant Pandas and their habitats, with a network of Giant Panda protection established in Sichuan, Shaanxi and Gansu Provinces. By 2010, Sichuan Province has invested 200 million yuan which resulted in the increase in the number of Giant Pandas to 41 and the area covered up to 23,000 km^2, protecting more than 50% of the habitats for Giant Panda in the province and more than 60% of wild Giant Pandas in PAs. With the support of WWF and other international organizations, Sichuan Province has implemented a number of projects on ecological corridors and community development to enhance connectivity between PAs and their management effectiveness through implementing relevant management plans and having initiated many poverty reduction programmes. In recent years, China has worked with Myanmar, Vietnam and Lao DPR on the Biodiversity Corridors of the Mekong River sub-region. The cooperation has achieved substantive progress in collaboration in PAs, personnel training, fire prevention in border areas and transboundary protection of Asian elephants. At the end of 2010, the State Council issued a notice on management of protected areas, which required that development activities affecting protected areas would be strictly limited and those activities within PAs would be monitored, inspected and well managed. Currently China is developing another national plan for protected areas, which will propose new requirements for spatial layouts and management of PAs. This plan will be incorporated into broader national plan for social and economic development for implementation.

1.3 To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries

1) What progress has been made in identifying conservation priorities and opportunities for establishing transboundary protected areas and regional networks?	**3**
2) If available, please indicate the URL (or attach a pdf) of the assessment of opportunities for transboundary protected areas and regional networks.	**http://politics.people.com.cn/GB/1026/10568760.html**

3) What actions have been taken to strengthen the regional protected area network and foster transboundary PAs? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Created transboundary protected area/s	√	√	√
	Contributed to the creation of regional-scale conservation corridors	√	√	√
	Participated in the establishment of regional networks	√	√	√
	Created enabling policies to allow for transboundary protected	√	√	√

	areas			
	Established a multi-country coordination mechanism	√	√	√
	Other actions to foster regional networks and transboundary areas	√	√	√

In 1994 China signed with Russia and Mongolia an agreement on joint protected areas, under which the three countries have been undertaking many activities such as joint surveys and monitoring, environmental education and exchange of experiences. Since 2006, China and Russia have established an intergovernmental working group on transboundary protected areas and biodiversity conservation, which meets on a regular basis every year. So far this working group has had six meetings. Both sides have signed cooperation agreements such as China-Russia strategy for development of networks of transboundary protected areas in Heilongjiang River Basin and China-Russia agreement on establishment of protected areas in Xingkai Lake. PAs in Sanjiang, Honghe and Bachadao in Heilongjiang Province, China have signed agreements with PAs in Basdak, Daherchel, Xinganski and Bolongski in Russia for cooperation. In 2013, China and Russia signed an agreement on protection of wild tigers. By this agreement both sides will accelerate the construction of migratory corridors for tigers and establish protected areas for tigers in border mountain areas. Both sides will also deepen cooperation in joint monitoring and research of wild animals, environmental communication and education, legislation and law enforcement related to PAs, eco-tourism planning and management.

In 2009, China and Lao DPR established the first transboundary protected areas-Shangyong, Xishuangbanna-South Tananmuha, to better protect Asian elephants and other migratory animals. In early 2012 the two countries signed a second agreement on establishing another transboundary protected area-Menglamanzhuang, China-Fengshali, Lao DPR border areas. In December 2012, the two countries signed one more agreement for another transboundary PA. So three transboundary PAs cover Xishuangbanna, China and the three northern provinces of Lao DPR.

In recent years, China has worked with Myanmar, Vietnam and Lao DPR on the Biodiversity Corridors of the Mekong River sub-region. The cooperation has achieved substantive progress in collaboration in PAs, personnel training, fire prevention in border areas and transboundary protection of Asian elephants.

1.4 To substantially improve site-based protected area planning and management

1) What progress has been made in developing protected area management plans?	**2**
1) What percentage of your protected areas has an adequate management plan?	
2) What percentage of the total surface area of protected areas does the management plan(s) cover?	
3) Please provide a URL (or pdf attachment) of a recent example of a participatory, science-based management plan	**http://www.doc88.com/p-18967633517.html**

4) What actions have been taken to improve protected area management planning? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Developed guidelines and tools for developing management plans			
	Provided training and/or technical support in management planning	√	√	√
	Developed management plans for protected areas	√	√	√
	Changed legislation or policy to strengthen management planning	√	√	√
	Improved the scientific basis of existing management plans	√	√	√
	Conducted protected area resource inventories	√	√	√
	Other actions to improve management planning	√	√	√

“Programme for Master Planning of National-level Nature Reserves” (2002), “Technical Guidelines for Master Planning of Nature Reserves” (2006) and “Technical Guidelines for Eco-Tourism Planning for Nature Reserves” (2006) have provided guidelines, procedures and specific requirements for master planning of nature reserves and eco-tourism planning.

Guidelines for Management and Standardized Construction of National-level Nature Reserves (Provisional) (2009) proposed requirements for establishment and management of protected areas.

1.5 To prevent and mitigate the negative impacts of key threats to protected areas

1) What progress has been made in assessing the status of protected area threats, and opportunities for mitigation, prevention and restoration?	**3**
2) If available, please indicate the URL (or attach a pdf) of the assessment of the status of threats and	

opportunities for mitigation, prevention and restoration.	

3) What actions have been taken to mitigate or prevent protected area threats, or restore degraded areas? Please check all that apply, and provide a brief description

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Changed the status and/or governance type of a protected area	√	√	√
	Improved staffing numbers and/or skills to prevent and mitigate threats	√	√	√
	Included measures to address threats in a management plan	√	√	√
	Improved management practices to prevent or mitigate threats	√	√	√
	Increased threat mitigation funding	√	√	√
	Developed a plan to address the impacts of climate change	√	√	√
	Changed market incentives to reduce or prevent threats	√	√	√
	Improved monitoring and detection of threats	√	√	√
	Evaluated the efficacy of threat-related actions	√	√	√
	Improved public awareness and behaviour regarding threats	√	√	√
	Changed laws and policies related to threats	√	√	√
	Restored degraded areas	√	√	√
	Developed and/or implemented strategies to mitigate threats	√	√	√
	Other actions to mitigate and prevent threats	√	√	√

In 2004, the State Environmental Protection Administration issued a notice on strengthening management of nature reserves. The notice required that in undertaking environmental impact assessments of all development projects affecting nature reserves, one special chapter should be included in the assessment report that will predict impacts on the structure, functions and targets of protection and their values, and propose measures for protection (in case projects are approved) as well as how the project implementers can protect, restore and compensate, based on impacts of the project. In 2008, the Ministry of Environmental Protection, together with other relevant ministries, issued another notice in this regard, stressing that these requirements must be met and negative impacts from development projects on PAs must be prevented. In 2011 the Ministry of Environmental Protection issued guidelines for supervision over PAs, which regulates the monitoring and supervision in PAs. MEP together with other relevant departments has organized many inspections on law enforcement in PAs to prevent damage from irrational development activities to nature reserves.

2.1 To promote equity and benefit-sharing

1) What progress has been made in assessing the equitable sharing of costs and benefits of establishing protected areas?	**2**
2) If available, please indicate the URL (or attach a pdf) of the assessment of equitable sharing of costs and benefits of establishing protected areas.	**(URL OR ATTACHMENT)**

3) What actions have been taken to improve equitable benefits sharing? Please check all that apply, and provide a brief description

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Developed compensation mechanisms		√	√
	Developed and/or applied policies for access and benefit sharing			
	Developed equitable benefits-sharing mechanisms			
	Diverted PA benefits towards poverty alleviation	√	√	√
	Other actions to strengthen equitable benefit--sharing			

4) What progress has been made in assessing protected area governance?	**3**
5) What percentage of protected areas has been assigned an IUCN category?	**(%)**
6) If available, please indicate the URL (or attach a pdf) of the assessment of protected area governance:	**http://www.cnki.com.cn/Article/CJF/DTotal-LDGH201006014.htm**

7) What actions have you taken to improve and diversify governance types? Please check all that apply, and provide a brief description

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Created new protected areas with innovative forms of governance, such as community conserved areas		√	√
	Changed laws or policies to enable new governance types			

	Other actions to diversify governance types			

China has implemented natural forest resources protection projects, established Fund for Compensation for Forest Ecological Benefits and some PAs got support from these projects and funds. China has established funds to be transferred to national key ecological function zones. In 2012, funds were transferred to 466 counties (cities, districts), with the total funds reaching 37.1 billion yuan RMB. The funds played an important role in supporting development of PAs. In 2007, the Ministry of Environmental Protection issued guidance for undertaking pilot work in ecological compensation, which required acceleration of the establishment of ecological compensation mechanisms for PAs. Some regions have established ecological compensation mechanisms on a pilot basis. For example, Jining City has issued rules for ecological compensation for wetland loss in Nansi Lake, Shandong Province.

Besides nature reserves, China has established other types of PAs such as forest parks, scenic spots, wetland parks, geological parks, community-based conservation areas and protected sites for wild agricultural plants (see details in section 2.3.4 of Part II). These PAs are important components of China's PA networks.

2.2 To enhance and secure involvement of indigenous and local communities and relevant stakeholders

1) What is the status of participation of indigenous and local communities and other key stakeholders in key protected area decisions?	**2**
2) What actions have been taken to improve indigenous and local community participation? Please check all that apply, and provide a brief description:	

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Assessed opportunities and needs for local community participation in key protected area decisions			
	Improved laws, policies and/or practices to promote participation	√	√	√
	Developed policies for prior informed consent for resettlement	√	√	√
	Improved mechanisms for participation of indigenous and local communities	√	√	√
	Increased participation of indigenous and local communities in key decisions	√	√	√
	Other actions to promote participation			

China has established public hearing and notice systems and mechanisms for public participation in environmental impact assessments. China has also strengthened capacities for minorities and local communities to allow them to participate effectively in relevant decision/policy making and planning processes.

3.1 To provide an enabling policy, institutional and socio-economic environment for protected areas

1) What progress has been made in assessing the policy environment for creating and managing protected areas?	**3**
2) If available, please indicate the URL (or attach a PDF) of the assessment of the policy environment:	**(URL OR ATTACHMENT)**
3) What actions have been taken to improve the protected area policy environment? Please check all that apply, and provide a brief description	

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Harmonized sectoral policies or laws to strengthen management effectiveness	√	√	√
	Integrated PA values and ecological services into the national economy	√	√	√
	Improved accountability and/or participation in decision-making	√	√	√
	Developed incentive mechanisms for private protected areas			
	Developed positive market incentives to support protected areas	√	√	√
	Removed perverse incentives that hinder effective management	√	√	√
	Strengthened laws for establishing or managing protected areas	√	√	√
	Cooperated with neighboring countries on transboundary areas	√	√	√

	Developed equitable dispute resolution mechanisms and procedures	√	√	√
	Other actions to improve the policy environment	√	√	√

4) What progress has been made in assessing the contribution of protected areas to the local and national economies?	**3**
5) What progress has been made in assessing the contribution of protected areas to the Millennium Development Goals?	**3**
6) If available, please indicate the URL (or attach a PDF) with the assessment of the contribution of protected areas to the local and national economy and to the Millennium Development Goals:	**http://www.cnki.com.cn/ Article/CJFDTotal-SAHG 201206043.htm**

7) What actions have been taken to value the contribution of protected areas? Please check all that apply, and provide a brief description

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Implemented a communication campaign to encourage policy makers to recognize the value of protected areas	√	√	√
	Created finance mechanisms linked to protected area values (e.g., payment for ecosystem services)			

In 1997, China issued National Programme for Development of Nature Reserves (1996-2010), and goals identified therein have been achieved. In 2003, the State Council approved National Plan for Wetland Conservation (2002-2030), and during the eleventh five-year plan period, a total investment of 3.03 billion yuan RMB was made and the tasks planned for the 12th five-year plan period are being implemented. In 2000 China developed a National Plan for Wild Flora and Fauna Conservation and Nature Reserves, which gave priority support to establishment of nature reserves. Currently China is developing National Plan for Development of Nature Reserves, which will be submitted to the State Council for approval and incorporated into national plans for social and economic development for different periods of time.

3.2 To build capacity for the planning, establishment and management of protected areas

1) What progress has been made in assessing protected area capacity needs?	**3**
2) If available, please indicate the URL (or attach a PDF) of the assessment of capacity needs:	**http://www.cnki.com.cn/ Article/CJFDTotal-BJLY 2011S2012.htm**

3) What actions have been taken to strengthen protected area capacity? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Created a professional development programme for protected area staff	√	√	√
	Trained protected area staff in key skills	√	√	√
	Increased the number of protected area staff	√	√	√
	Developed a system for valuing and sharing traditional knowledge	√	√	√
	Other actions to improve capacity	√	√	√

Since 1998, the Ministry of Finance has established Specialized Funds for Capacity Building of National-level Nature Reserves. By 2012, the cumulative investment has reached 790 million yuan RMB, which is devoted to strengthening management, conservation, research and educational capacities of PAs. These investments played a very positive role in upgrading management level of PAs. Since 2008, China has also established Specialized Funds for Capacity Building of PAs managed by the forestry sector.

Beijing, Inner Mongolia, Heilongjiang, Zhejiang, Jiangxi, Fujian, Shandong, Hunan, Guangdong, Ningxia and other provinces (autonomous regions or province-level municipalities) have established their own specialized funds for protected areas. From 2000 to 2009 Guangdong Province invested more than 300 million yuan RMB into protected areas. Fujian Province increased standards for ecological compensation as well as investments into infrastructure of nature and forest reserves at provincial and above levels, and strengthened management of protected areas.

The departments of the environment, forestry and agriculture responsible for management of nature reserves have organized many training workshops on nature reserve management, focusing on relevant policies and regulations, standardized

management, plan development, capacity building project design, supervision of development activities, establishment of management information systems and survey of status of biological resources.

With the support from the GEF, WWF and other international organizations, China has implemented projects on management of nature reserves, conservation and sustainable use of wetland biodiversity and sustainable forest development. These projects have played a very important role in strengthening capacities for nature reserves.

3.3 To develop, apply and transfer appropriate technologies for protected areas

1) What progress has been made in assessing the needs for relevant and appropriate technology for protected area management?	**3**
2) If available, please indicate the URL (or attached a PDF) of the assessment of the technology needs:	**(URL OR ATTACHMENT)**

3) What actions have been taken to improve the access to and use of relevant and appropriate technology? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Developed and/or used appropriate technology for habitat restoration and rehabilitation	√	√	√
	Developed and/or used appropriate technology for resource mapping, biological inventories and rapid assessments	√	√	√
	Developed and/or used appropriate technology for monitoring	√	√	√
	Developed and/or used appropriate technology for conservation and sustainable use	√	√	√
	Encouraged technology transfer and cooperation between protected areas and agencies	√	√	√
	Other actions to improve access to and use of appropriate technologies	√	√	√

The Ministry of Science and Technology has established projects such as “research and demonstration on key techniques for development of protected areas”. The study will be undertaken from six aspects: PA system establishment, function zoning, habitat quality and dynamic monitoring of biological resources, protection of endangered species, restoration of affected ecosystems and sustainable use of biological resources and suitable business. These studies will provide technical support to development of PAs in China. The departments of the environment, agriculture and forestry responsible for PAs have been promoting and improving various techniques and innovative approaches for effective management of PAs as well as exchanges of the experiences in this regard, through training activities and meetings. Various PAs have obtained and extensively used techniques for survey, monitoring, conservation and management and upgraded their management level, through collaboration with institutions of higher education, research institutes and NGOs.

3.4 To ensure financial sustainability of protected areas and national and regional systems of protected areas

1) What progress has been made in assessing protected area finance needs?	**3**
2) If available, please indicate the URL (or attach a PDF) of the assessment of finance needs:	**(URL OR ATTACHMENT)**
3) What progress has been made in developing and implementing a sustainable finance plan that incorporates a diversified portfolio of financial mechanisms?	**2**
4) If available, please indicate the URL (or attach a PDF) of the sustainable finance plan:	**(URL OR ATTACHMENT)**

5) What actions have been taken to improve the sustainable finance of your protected areas? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Developed new protected area funding mechanisms	√	√	√
	Developed protected area business plan or plans	√	√	√
	Developed revenue-sharing mechanism			
	Improved resource allocation procedures	√	√	√
	Provided financial training and support			
	Improved accounting and monitoring	√	√	√
	Improved financial planning capacity			
	Removed legal barriers to sustainable finance			

	Clarified inter-agency fiscal responsibilities			
	Other actions to improve sustainable finance			

Please see details related to 2.1 and 3.2 above.

3.5 To strengthen communication, education and public awareness

1) What progress have you made in conducting a public awareness and communication campaign?	**3**
2) If available, please indicate the URL (or attach a PDF) of the public awareness and communication plan:	**http://www.ynly.gov.cn/news /200810/12064.shtml**

3) What actions have you taken to improve public awareness and strengthen education programmes? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Identify core themes for education, awareness and communication programmes relevant to protected areas	√	√	√
	Conducted an awareness campaign on the value of protected areas to local and national economies and the Millennium Development Goals	√	√	√
	Conducted an awareness campaign on the value of protected areas in climate change adaptation and mitigation	√	√	√
	Established or strengthen communication mechanisms with key target groups, including indigenous and local communities	√	√	√
	Developed protected area curricula with educational institutions	√	√	√
	Produced public outreach materials	√	√	√
	Conducted public outreach programmes	√	√	√
	Other actions to improve communication, education and awareness	√	√	√

China encourages and requires PAs to undertake extensive communication and educational activities to increase public recognition of the importance and benefits of PAs. They put communication boards and slogans in PAs and disseminate PA brochures to tourists and local communities. Various departments and local governments organize various kinds of communication and educational activities to introduce the value and importance of PAs, through activities celebrating biodiversity-related dates such as the International Day of Biodiversity and the Earth Day.

4.1 To develop and adopt minimum standards and best practices for national and regional protected area systems

1) What progress has been made in developing best practices and minimum standards?	**3**
2) If available, please indicate the URL (or attach a PDF) of examples of protected area best practices and minimum standards.	
3) Is there a system in place for monitoring protected area outcomes achieved through the programme of work on protected areas	**YES**

4) What actions have been taken related to best practices and minimum standards? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Developed standards and best practices for protected area establishment and selection	√	√	√
	Developed standards and best practices for protected area management planning	√	√	√
	Developed standards and best practices for protected area management	√	√	√
	Developed standards and best practices for protected area governance	√	√	√
	Collaborated with other Parties and relevant organizations to test, review and promote best practices and minimum standards	√	√	√
	Other actions related to best practices and minimum standards	√	√	√

In 1999 China developed standards for approving national-level protected areas, in which indicators for planning and management of national-level PAs were proposed. In 2002, China issued a programme for master planning of national-level PAs to guide the development and implementation of master planning for national-level PAs. In 2006, China issued technical procedures for master planning of PAs and undertaking eco-tourism in PAs, which provided basic guidelines for PA planning and eco-tourism planning. In 2009, China issued provisional guidelines for standardized construction and management of national-level PAs, which further regulates the development and management of national-level PAs. In 2010, China issued guidelines for undertaking scientific research and tours in PAs to regulate such activities in PAs.

4.2 To evaluate and improve the effectiveness of protected areas management

1) What progress has been made in assessing the management effectiveness of protected areas?	**3**
2) If available, please indicate the URL (or attach a PDF) of the assessment of protected area management effectiveness:	**http://www.zhb.gov.cn/gkml/hbb/bgt/201005/w020100524534788478025.pdf**
3) In what percentage of the total area of protected areas has management effectiveness been assessed?	**62.9%**
4) In what percentage of the number of protected areas has management effectiveness been assessed?	**13.6%**

5) What actions have been taken to improve management processes within protected areas? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Improved management systems and processes	√	√	√
	Improved law enforcement	√	√	√
	Improved stakeholder relations	√	√	√
	Improved visitor management	√	√	√
	Improved management of natural and cultural resources	√	√	√
	Other actions to improve management effectiveness	√	√	√
	Have you submitted management effectiveness results to UNEP-WCMC's WDPA	√	√	√

For information concerning the improvement of PA management, please see details in 1.4.

Since 2008, the Ministry of Environmental Protection and six other central government departments have jointly organized assessments of management effectiveness of national-level PAs, putting PA management on more standardized track. By 2012, assessments have been completed for more than 300 national-level PAs. MEP and other departments have also inspected law enforcement in PAs to prevent damage from irrational development activities to PAs.

4.3 To assess and monitor protected area status and trends

1) What progress has been made in establishing an effective monitoring system of protected area coverage, status and trends?	**3**
2) If available, please indicate the URL (or attach a PDF) of a recent monitoring report.	**http://www.shidi.org/sf_A4B06758596347D2A155665A2331390C_151_pyh.html**

3) What actions have been taken to improve protected area monitoring? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Assessed the status and trend of key biodiversity	√	√	√
	Monitored the coverage of protected areas	√	√	√
	Developed or improved a biological monitoring programme	√	√	√
	Developed a database for managing protected area data	√	√	√
	Revised management plan based on monitoring and/or research results	√	√	√
	Changed management practices based on the results of monitoring and/or research	√	√	√
	Developed geographic information systems (GIS) and/or remote sensing technologies	√	√	√

Other monitoring activities	√	√	√

China encourages and promotes monitoring of PAs. The Ministry of Science and Technology has established key projects such as "monitoring of important biological resources and key techniques for their conservation and demonstration application of these techniques". These projects aim to design monitoring networks and strengthen research on various standards of monitoring. In 2004, the State Oceanic Administration issued "Technical Guidelines for Monitoring of Marine PAs-General Principles", which provided the content, technical requirements and methods for monitoring MPAs. The Ministry of Environmental Protection is developing technical guidelines for monitoring of species. In 2011 Henan Province Forestry Department issued a provisional programme for research and monitoring in PAs, which further regulates relevant work in PAs in the province.

Since 2009, the Ministry of Environmental Protection initiated the first baseline survey of PAs in China, with a view to identifying all types of PAs at all levels and their status and management. In 2011 MEP established a remote-sensing monitoring system of PAs by using the environment satellite, which can monitor in time through satellite remote-sensing and undertake on-site inspection based on information provided by the satellite remote-sensing. An integrated monitoring of PAs from the sky and on the ground has been established. In 2012 MEP and CAS initiated a Project on Remote-sensing and Assessment of Ecological Changes in the decade 2000-2010. In this project there is a sub-project on changes in national-level PAs, which will study the environmental issues and threats/pressures/drivers faced by more than 300 national-level PAs, and comprehensively assess the effectiveness of PAs in China.

Most PAs in China have certain capacities for monitoring, with some of them undertaking long-term monitoring of biodiversity. PAs such as those in Changbai Mountain, Dongling Mountain, Shennongjia, Gutian Mountain, Dinghu Mountain and Xishuangbanna have established big sample sites for monitoring.

4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems

1) What progress has been made in developing an appropriate science and research programme to support protected area establishment and management?	**3**
2) If available, please indicate the URL (or attach a PDF) of a recent research report:	

3) What actions have been taken to improve protected area research and monitoring? Please check all that apply, and provide a brief description:

√	ACTION	BEFORE 2004	BETWEEN 2004 - 2009	SINCE 2010
	Identified key research needs	√	√	√
	Assessed the status and trends of key biodiversity	√	√	√
	Developed or improved a biological monitoring programme	√	√	√
	Conducted protected area research on key socio-economic issues	√	√	√
	Promoted dissemination of protected area research	√	√	√
	Revised management plan based on monitoring and/or research results	√	√	√
	Changed management practices based on the results of monitoring and/or research	√	√	√
	Other research and monitoring activities	√	√	√

After more than 50 years of surveys of China's biota and more than 100 years of information collection, the Chinese Academy of Sciences has published "Flora of China", "Fauna of China", "China Spore Plants Annals" and large volumes of local plant and animal annals. All these publications provide scientific basis for establishment of PAs and improvement of their management.

To further develop science related to PAs, Beijing University of Forestry has established an institute of PAs; Nanjing Institute of Environmental Sciences under MEP has established a research centre on PAs, and the Forestry Department of Guangdong Province and South China University of Agriculture have jointly established

Guangdong Provincial Research Centre on PAs. All these research centres and institutes have made considerable progress in sciences related to PAs.

With the support of the GEF, China has implemented projects on PA management, conservation and sustainable use of wetland biodiversity, and sustainable forest management. These projects help introduce advanced concepts and methods of nature conservation from other countries.

The departments of the environment, agriculture and forestry responsible for PAs have organized many training workshops and seminars to promote theory, technical and innovative approaches for improving PA management, and to help upgrade PA management level.

Annex V. Implementation of the Capacity-building Strategy for the Global Taxonomy Initiative and the Global Strategy for Plant Conservation

Relevant COP decisions, programmes of work and suggested activities	National Implementation and Contributions	Assessment of Progress
The Capacity-building Strategy for the Global Taxonomy Initiative		
Action 1: By the end of 2013, at the latest, review taxonomic needs and capacities at national, subregional and regional levels and set priorities to implement the Convention and the Strategic Plan for Biodiversity 2011-2020.	A preliminary assessment was made of capacities for Chinese and Asian plant taxonomy. A report on progress in plant conservation in Asia-the implementation of the Global Strategy for Plant Conservation in Asia was published in 2011, however needs assessments are yet to be undertaken.	**Partially completed**
Action 2: By the end of 2013, organize regional and subregional workshops aimed at informing Parties and their CBD/GTI national focal points, representatives of ministries of science, education and conservation, and other relevant sectors about the importance of taxonomy and the need for cooperation in this field to implement the Convention and the Strategic Plan for Biodiversity 2011-2020.	China has actively undertaken training activities related to taxonomy and introduced the importance of taxonomy to biodiversity conservation. For example, the Institute of Botany of the Chinese Academy of Sciences organized a training workshop on botanical taxonomy in September 2011. This workshop introduced history of taxonomy, basic theory and methods of taxonomy, focusing on systems of classification of vascular plants as well as their taxonomic traits of various vascular plants and techniques for identifying and classifying common populations and those difficult to identify. Through training, trainees have mastered classical methods of plant taxonomy as well as the importance of plant taxonomic studies by using new techniques and methods. A training workshop was organized by Shanghai Chenshan Botanical Garden (Plant Research Centre in Chenshan, Shanghai, under CAS) in October 2012 for those personnel working on the site. The training content included history and literature of taxonomy, plant taxonomic research methodologies, seed plant taxonomy, moss plant classification and application, fern plant taxonomy, plant specimen museum establishment and associated management techniques, molecular phylogeny analysis and population genetics. Nearly 130 participants from more than 40 institutions attended the workshop. China Fungi Research Society organized three workshops on fungi taxonomy, diversity and systemic evolution respectively in 2010, 2011 and 2013. The workshops invited taxonomic experts from	**Fully completed**

	home and abroad to introduce fundamental theory, methods and application of new technologies concerning fungi taxonomy and population genetics. Collection of specimens in the wild and taxonomic identification were organized for participants. The workshops were attended by more than 150 participants from over 50 institutions.	
Action 3: By 2014, organize additional technical workshops and academic training to improve taxonomic skills and the quality of taxonomic knowledge and information, as well as the contribution of taxonomy for the implementation of the Convention.	Being planned.	
Action 4: By 2015, produce and continue to share taxonomic tools (e.g., field guides, online tools such as virtual herbaria, genetic and DNA sequence-based identification tools such as barcoding) and risk-analysis tools in the context of invasive alien species and biosafety, taking into account the identified needs of users; and facilitate the use of those tools to identify and analyse: (i) threatened species; (ii) invasive alien species; (iii) species and traits that are useful to agriculture and aquaculture; (iv) species subject to illegal trafficking; and (v) socio-economically important species, including microbial diversity.	China has launched many tools for taxonomy. Flora of China can be searched on line. Its English version database was launched at the same time as hard copies were published. Flora of Pan-Himalaya Region under development will be available on line before hard copies are printed. and will contain more information. Since 2008, the Ministry of Science and Technology has been strongly promoting the establishment of national platform for sharing specimens. Currently the number of specimens shared on-line has reached 8 million pieces, with 1 million pages of documents, and 4 million pictures taken in the wild and 15,060 holotypes compiled. Technological system using digital survey in the wild and information management as well as relevant information systems have been established. In September 2012, CD of China Species List 2012 was developed by China node of Species 2000 and launched by the Science Press. In 2010 the Ministry of Environmental Protection issued provisional technical guidelines for surveying plant species and resources. And MEP is developing technical guidelines for monitoring species. All this has provided a good basis for undertaking the survey and monitoring of species in the wild. The agriculture and quality supervision departments have developed tools for risk assessment of pests, and they have been undertaking risk assessments of invasive alien species.	**Mostly completed**
Action 5: By 2015, review and enhance human capacity and infrastructure to identify and to assist monitoring of	China has assessed the existing capacities and facilities for biodiversity monitoring and proposed a programme for establishing national biodiversity monitoring network. China has also established a national network of monitoring of forest biodiversity. China is developing technical guidelines for species	**Mostly completed**

biodiversity, particularly on invasive alien species, understudied taxa, threatened and socio-economically important species among others. The review might be undertaken with regional networks and coordinated with national and international activities.	monitoring, covering many populations including those populations not well studied.	
Action 6: To the extent possible, support existing efforts to establish capacity for national and thematic biodiversity information facilities, build and maintain the information systems and infrastructure needed to collate, curate and track the use of biological specimens, in particular type specimens, and provide free and open access to the relevant biodiversity information for the public by 2016.	Flora of China can be searched on line. Its English version database was launched at the same time as hard copies were published. Flora of Pan-Himalaya Region under development will be available on line before hard copies are printed. The establishment of national platform for sharing specimens and other relevant information systems will make it possible to get specimens, documents and pictures from Flora of China. The information therein can be accessible to the public free of charge.	**Completed**
Action 7: By 2017, establish the human resources and infrastructure sufficient to maintain the existing collections and build further collections of biological specimens and living genetic resources. This action may strengthen and facilitate: (i) *ex-situ* conservation of microorganisms; (ii) engagement of academics; (iii) internships, exchanges and cooperation of experts; (iv) job opportunities for becoming specialized and continuing to work in taxonomy; (v) allocation of public-funds for	As a result of efforts of many years, China has stored more than 30 million specimens. To better store collected crop genetic resources, China has expanded and renovated 1 national long-term banks, 1 national copy bank, 10 national mid-term banks ad 32 national germplasm nurseries. China has built 7 new national germplasm nurseries. The total number of agricultural crops stored in these facilities has reached 423,000 accessions, mainly being local varieties and wild relatives. Many research institutions and universities in China have established plant specimen museums, with relevant professionals and facilities provided for these museums. They have also collected, stored and identified plant specimens. Animal specimens in China should be fully collected and stored in specimen museums in the future.	**Mostly completed**

establishment and maintenance of collections infrastructure; (vi) business-case for investment in human resources and infrastructure; (vii) access to information; and (viii) coordinated global systems of biological collections.		
Action 8: By 2019, improve the quality and increase the quantity of records on biodiversity in historic, current and future collections and make them available through taxonomic and genetic databases to enhance resolution and increase confidence of biodiversity prediction models under different scenarios.	Since 2008, the Ministry of Science and Technology has been strongly promoting the establishment of national platform for sharing specimens. Currently the number of specimens shared on-line has reached 8 million copies, with 1 million pages of documents, and 4 million pictures taken in the wild and 15,060 holotypes compiled. The system allows for high-speed browsing and statistical analysis. Technological system using digital survey in the wild and information management as well as relevant information systems have been established. The establishment of this platform will provide basic data for biodiversity scenario modelling in different circumstances.	**Mostly completed**
Action 9: Facilitation of all-taxa inventories in targeted national, regional and subregional priority areas such as biodiversity hot spots, key biodiversity areas, protected areas, community–conserved areas, sustainable biodiversity management zones, and socio-ecological production landscapes considered under the *Satoyama* Initiative and other programmes in which biodiversity inventories are a priority for decision-making.	In September 2012, CD of China Species List 2012 was developed by China node of Species 2000 and launched by the Science Press. This list provides a good baseline data for taxonomic research as well as core taxonomic programmes for management and application of biodiversity information. Based on this list, China has completed national biodiversity assessments. For the first time China has collected information from county level concerning distribution of 34,039 wild vascular plants in 2,376 counties. China has established biodiversity information system. Using this system you can easily identify national hotspots for plant biodiversity and develop a list of vascular plants in hotspots and biodiversity priority areas.	**Mostly completed**
Action 10: Between 2018 and 2020, using, *inter alia*, the Aichi Biodiversity Target	Being planned.	

indicators relevant to taxonomy, evaluate the progress in the GTI Capacity-building Strategy at the national, subregional, regional and global levels with a view to sustaining them beyond 2020.		

The Global Strategy for Plant Conservation (2011-2020）

Target 1: An online flora of all known plants.	Flora of China can be searched on line. Its English version database was launched at the same time as hard copies were published. Flora of Pan-Himalaya under development will be available on line before hard copies are printed. The establishment of national platform for sharing specimens and other relevant information systems will make it possible to get specimens, documents and pictures from plant annals.	**Fully completed**
Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.	China Biodiversity Red List-Higher Plant Volume, which is going to be published soon, assesses 34,450 species (including sub-species) in accordance with IUCN standards, by following four steps including basic list development, searching species information, panel pre-review and expert review and examination. The result shows that there are 52 species that are extinct, extinct in the wild or regional extinct, and 3,767 species that are critically endangered, endangered and vulnerable. The publication of this list will provide important baselines for plant conservation in China.	**Fully completed**
Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.	China has promoted the achievement of this target through compiling plant annals, establishment of network of PAs and the national platform for sharing specimens.	**Mostly completed**
Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration.	China has established a network of PAs including 2,697 nature reserves, with areas covered accounting for 14.8% of the country's land area and protecting effectively 90% of the terrestrial ecosystems, 65% of higher plant communities, 25% of primitive natural forests, more than 50% of natural wetlands and 30% of typical desert areas. Meanwhile restoration of various ecosystems has been enhanced through implementing key ecological projects such as natural forest resources protection, returning cultivated land to forests, wetland conservation and desertification control.	**Fully completed**
Target 5: At least 75 per cent of the most	China has established 407 national-level nature reserves protecting the most important regions including forest, grassland, desert and wetland and other ecosystems.	**Mostly completed**

important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.		
Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.	China has a tradition of intensive and rotational cultivation and intercropping , which is very favorable to biodiversity conservation. Since 2000, China has organized creation of eco-provinces, eco-cities and eco-counties. The goal of this action is consistent with that of GSPC. So far 15 provinces (cities) have started eco-province initiatives, and 13 provinces have issued programmes for building eco-provinces. More than 1,000 counties (cities, districts) have started eco-county initiatives. Since 2007, 38 counties (cities, districts) have been awarded national-level eco-counties, and 1,559 towns as national-level eco-towns and 238 villages as national-level eco-villages.	**Partially completed**
Target 7: At least 75 per cent of known threatened plant species conserved in situ.	85% of national key protected plants have been protected according to relevant statistics. In 2012, SFA initiated a project to protect and rescue wild plants with extremely small populations, including a five-year campaign to protect and rescue 120 plant species with extremely small populations. The implementation of this campaign will effectively improve conditions for critically endangered, rare wild plants.	**Mostly completed**
Target 8: At least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes.	Southwest China Germplasm Bank of Wild Resources was established in Kunming, Yunnan, which is the first germplasm bank established for wild flora and fauna and micro-organisms. It started operation from 29 October 2008. By April 2013, the bank has collected and stored 76,864 copies of plant seeds of 10,096 species. Meanwhile, a network of botanical gardens with those in Beijing (under CAS), Wuhan, Kunming and South China as core botanical gardens has well implemented *ex-situ* conservation of plants.	**Mostly completed**
Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.	National Crops Germplasm Bank was established in 1986 for storing seeds of germplasm of crops and wild relatives. So far the number of germplasms stored has exceeded 423,000 accessions. The national bank plays a very important in storing and using genetic resources of crops in China.	**Mostly completed**

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.	China has established a relatively sound system of inspection and quarantine to prevent invasion of new alien species from international trade. In the national networks of PAs, the management of endangered, rare plants and plant communities distributed within PAs and relevant habitats within PAs as well as alien plants has been integrated into the routine management plan of various PAs.	**Partially completed**
Target 11: No species of wild flora endangered by international trade.	China is effectively implementing the CITES and regulating international trade in endangered wild plants so no wild plant species are being endangered due to regular international trade.	**Mostly completed**
Target 12: All wild harvested plant-based products sourced sustainably.	Currently the percentage of products extracted from wild plants for social and economic uses in China is small. Major herbal materials such as Ginseng, Honeysuckle and Tianma have been artificially cultivated so that sustainable use of biological resources is achieved while protecting wild resources.	
Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.	China actively collects, stores and uses local traditional knowledge. The Institute of Biotechnology and Germplasm Resources of Yunnan Province Academy of Agricultural Sciences has developed advanced and practical methods for surveying, collecting, storing and assessing traditional knowledge, and encouraged farmers holding traditional knowledge to publish articles on traditional knowledge. And the institute has stored and documented more than 300 pieces of traditional knowledge related to agricultural biodiversity. The institute has created a training model where farmers give lectures and resources surveyors and analysts participate. A total of over 600 farmers and technicians participated in the training, with their capacities and level to protect and use agricultural biological resources and associated traditional knowledge upgraded and the protection of warts grain wild rice and development of unique industries in ethnic-minority-residing areas in Yunnan promoted.	**Partially completed**

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.	Plant biodiversity knowledge has become an important element of national science popularization programmes, and is disseminated to the public through TV, radio, newspapers and other media, on the National Day for Science Popularization and in botanical gardens. For education, besides biology in middle schools, science teaching is common in many primary schools across the country. The percentage of knowledge concerning plant biodiversity and conservation is gradually increasing in science teaching. A number of biodiversity information systems established by CAS such as information-sharing platforms for natural specimens museums and specimens for teaching contain a large of information concerning plants. These systems provide the public effective ways to gain knowledge concerning plant biodiversity.	**Mostly completed**
Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.	MEP, together with CAS and PAs has organized training workshops on techniques for surveying species in the wild. In particular since 2009, the Institute of Botany of CAS has organized consecutively five training workshops on application of digitalization and land marking techniques in wild surveys and plant photographic techniques. The training workshops covered GPS positioning, information collection through digital photography, and internet information management. Through these training activities, equipment such as digital camera, GPS loggers have been gradually used in the surveys and monitoring of plants. Some protected areas have begun to try using internet information systems to manage data from surveys and monitoring and for science popularization. In sum, the number of trained and adequately equipped staff for plant conservation in PA management is gradually increasing, however the number and capacities of such personnel need to be further increased.	**Partially completed**
Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.	China has established the Coordinating Group for the Implementation of the CBD, the Inter-ministerial Joint Conference on Conservation of Biological Resources and China National Committee on Biodiversity Conservation. This indicates full, strategic importance China attaches to biodiversity conservation. Meanwhile the Ministry of Agriculture and SFA are responsible for protection of wild plants and forests. Most of the provinces (autonomous regions, province-level cities) have established inter-sectoral coordinating mechanisms to coordinate biodiversity conservation and management within their jurisdictions.	**Mostly completed**

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