Northeast Asia

Chapter 12. China

Summary 317
Introduction 318
Institutional and administrative context 319
Box 1. Legal procedures for biodiversity conservation 320
NBAP origin and background 321
United Nations Conference on Environment and Development 321
National Biodiversity Conservation Action Plan 322
Scope and objectives 323
NBAP preparatory workshops 324
NBAP development 324
Relationship to development planning 326
Implementation 328
Monitoring and follow-up 329
Box 2. China's Report to COP-4 329
Lessons learned 330
Lessons learned during NBAP implementation 331
Recommendations 333
Chronology 337
Endnotes 342
References 343
Appendix 1. Major laws, measures and regulations 344

CHAPTER 12

China

Wang Sung, Wang Xianpu, Xie Yan, Jin Jianming, Chen Changdu, Wang Zongyi and Qing Jianhua

SUMMARY

In 1992 China was one of the first countries to ratify the Convention on Biological Diversity. It was the first nation to prepare a national action plan for biodiversity conservation; this was finalised and officially released by the State Council in the early 1990s.

After several years of NBAP implementation, there is an urgent need to identify and benefit from the lessons learned. It is also vital that China learn from the lessons of other countries, especially its regional neighbours. An overall review of the NBAP is needed in order to carry out sub-BAPs on specific themes, regions and taxa, and to strengthen NBAP implementation by integrating it with state planning.

The key lessons from developing and implementing the NBAP relate to coordination among various sectors, overcoming sectoral barriers, improper administration and bureaucratic interference, the shortage of accurate scientific data and information, a lack of participation by some sectors and the difficulties of integrating conservation with economic development. Issues vital to increasing the status and impact of the NBAP include effectively communicating its messages, long-term continuation of the organizing structure, monitoring and revision, financial support for implementation, strengthening scientific research and data collection and heightened public awareness, especially among decision-makers.

China's biodiversity is under pressure from a huge population and rapid development, and integrating the NBAP with development planning is critical to its sustainability. Government should place a high priority on active follow-up of the existing NBAP.

These are the key issues which will determine progress in the NBAP process:

- establishing a powerful coordinating body under the State Council to ensure effective NBAP implementation;
- creating greater public awareness of the NBAP (even governors and officials in charge of various aspects of biodiversity know very little about biodiversity);
- making the NBAP document a systematic and comprehensive program of follow-up actions to implement the NBAP, rather than an end in itself;
- follow-up at provincial and county (city) levels; and
- developing a fund-raising strategy for BSAP activities in implementing and formulating sub-BSAPs which target both domestic and international sources.

Introduction

China's biological diversity is of great importance to national economic development. It also has global significance. China's ecosystems range from tropical rain forests to tundra and from coral reefs to alpine meadows. This ecosystem diversity makes China one of the world's three most plant-rich nations. Over half of all China's plants occur nowhere else on earth. One in eight of the world's mammals, birds and fishes are found in China. It is also a centre for genetic variants of domesticated crops like rice and tea, and domesticated animals like chickens, pigs and ducks. These biological riches occur in a land of 1.2 billion people; consequently, over 15 per cent of plants are threatened, many species of wildlife are endangered and important mammals like the Saiga antelope *(Saiga tatarica)* are now extinct within China (Biodiversity Committee 1992).

China has recognized the economic and cultural importance of its biodiversity, and has taken steps to counter the many threats posed by a huge population and the impact of rapid economic growth. A number of measures have been taken to conserve biological resources and establish sustainable patterns for their use. Over the last few decades, for example, China has developed a national system of nature reserves. These protected areas already number over 1,000, including about 100 at the national level. By the early 1990s these reserves covered 72 million ha or 7.2 per cent of the total land area. In addition, Chinese scientists have made a major effort to inventory the country's biodiversity, making collections of several million specimens, publishing hundreds of books and papers, preparing lists of endangered species (e.g., *China Plant Red Data Book: Rare and Endangered Plants, 1992* and *China Red*

Data Book of Endangered Animals, Vols 1-4, 1998-9), and publishing recommendations for action (e.g., *Biodiversity in China*, 1992).

In the 1980s and 1990s, the government (at both the national and provincial levels) enacted measures aimed at preserving China's natural heritage. Many laws and regulations were passed to protect and control the use of living species (Appendix 1). Conservation and sustainable use policies were introduced by organizations such as the Ministry of Sciences and Technology, National Scientific Foundation, and Chinese Academy of Sciences.

China has also taken several important steps at the international level. The country joined a number of international conventions and programs, such as UNESCO's Man and Biosphere Program (MAB), the World Heritage Convention (WHC), the RAMSAR Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Migratory Bird Conventions. In 1992, China became one of the first six nations to ratify the Convention on Biological Diversity (CBD). It moved ahead with its implementation even before the CBD came into force, developing a National Biodiversity Action Plan (NBAP) in 1994.

Over this same period, China cooperated with many international organizations on biodiversity conservation and initiated a number of bilateral programs[1]. During the early 1990s, the Chinese government created the China Council for International Cooperation on Environment and Development (CCICED), a high-level vehicle for increasing international cooperation on environment and development which makes specific recommendations to the State Council. One component of CCICED, the Biodiversity Working Group (BWG), has a specific focus on biodiversity.

Institutional and administrative context

Through the 1990s the State Council made institutional changes related to biodiversity management and its implementation. The State Environmental Protection Administration (SEPA) was designated as the lead agency to coordinate and monitor biodiversity conservation and implement the CBD. SEPA was chiefly responsible for developing and implementing the NBAP, although many agencies and ministries at the provincial and national governmental levels were involved in the NBAP process.

Although laws that effect the country's biodiversity have been enacted since the inception of the People's Republic of China in 1949, it is in the last decade that China has adopted a series of very significant laws and regulations for conserving biodiversity (Appendix 1).

Box 1. Legal procedures for biodiversity conservation

Appendix 1 and the Chronology list the many key events, laws, regulations and licensing procedures which have had a part in the development of a comprehensive approach to the management of China's biological diversity. Several are of special importance because of their impact on the development of the NBAP:

- **in 1986, China promulgated the Administrative Rules of Environmental Protection for Construction Projects, which stipulates that any construction project which might have an impact on the environment be subject to an environmental impact assessment.**
- **in 1994, China promulgated the Regulations About Nature Reserves, which specified how nature reserves and scenic spots would be managed[2]. It is increasingly felt, however, that local legislation which specifically deals with nature conservation and reflects local needs and characteristics is required. Such legislation should include special purpose regulations and provisions within other laws related to biodiversity conservation.**
- **the Temporary Regulation on Management of Scenic Sites, issued in 1985, identified various systems and measures for protection, planning, construction and management of scenic sites at various levels. Similar provisions can be found in some local regulations.**
- **as the major legislation for the conservation of species diversity, the Wildlife Protection Law was approved and launched in 1988 after a long gestation period which included consultation and coordination among related governmental sectors. The involvement of the Chinese Academy of Sciences was essential on technical issues including the preparation of the Key Protected Wildlife Species List (officially issued in 1989 following approval by the State Council). Regulations on applying the Wildlife Protection Law to the listed terrestrial and aquatic species were announced by the Ministry of Forestry and Agriculture in 1992 and 1993.**

A number of other laws and regulations concerning various aspects of species, ecosystem or/and genetic biodiversity conservation and use were introduced during the 1980s and 1990s. Local legislation on biodiversity conservation has also been introduced in a number of provinces.

NBAP origin and background

Prior to UNCED, China actively participated in intergovernmental negotiation and promoted the formulation of the Draft Convention on Biological Diversity (CBD). Former Chinese Premier Li Peng signed the CBD at UNCED. In the same year, the CBD was approved by the 28th conference of the seventh China People's Congress (CPC). A year later, in 1993, China ratified the Convention, one of the first six countries to do so.

China began to implement the CBD immediately after UNCED. In 1992, the 23rd meeting of the State Council Environment Protection Committee decided that the National Environmental Protection Agency (NEPA, now known as SEPA) would be the lead agency for CBD implementation. A CBD Implementation Coordinating Group was formed early in 1993[3].

Up to that time a number of sectors and institutions had undertaken various biodiversity conservation initiatives. In 1990 the Chinese Academy of Sciences (CAS), the pioneer of scientific research in the field of biodiversity conservation, established a Biodiversity Working Group aimed at promoting and organizing biodiversity programs in CAS as well as in the State Science and Technology Commission and the National Science Foundation. The first symposium on biodiversity conservation in China sponsored by CAS's Biodiversity Working Group was held in March 1990 (Wang, 1990). The symposium brought the idea of biodiversity and its conservation to China for the first time. The Proceedings were widely distributed to governors, governmental agencies and institutions and, together with the Chinese version of Conserving the World's Biodiversity, began raising public awareness of biodiversity issues.

Later a larger CAS Biodiversity Committee was established by reforming and expanding the CAS Biodiversity Working Group. The Committee organised and undertook many significant biodiversity initiatives, including research programs, publishing of the magazine *Chinese Biodiversity*, along with a series of books, and sponsoring a number of domestic and international seminars and workshops on biodiversity.

In 1992, the State Council established the China Council for International Cooperation on Environment and Development (CCICED). CCICED has a number of working groups, including the Biodiversity Working Group (BWG), which comprises Chinese and international experts. Since being established the BWG has annually made a number of significant recommendations for biodiversity conservation balancing the global perspective with Chinese reality.

Also during the early 1990s, country-wide studies began to catalogue China's biodiversity resources. The first publication, *Biodiversity in China: Status and Conservation Needs*, was issued at UNCED. This was followed in 1993 by a country study influenced by the ongoing work of the World Conservation Monitoring Centre and published through CAS entitled *Chinese Biodiversity: Status and Conservation Strategy*. In the mid-1990s, NEPA initiated the *China Biodiversity Country Study*, supported by the Global Environmental Facility (GEF), which was published in 1998. Both studies describe the status of China's biodiversity, evaluate its values and benefits, estimate the cost of implementing the CBD and stress the necessity of strengthening the capacity of the state in biodiversity conservation.

During this same period, many universities and colleges set up centres for research and education in the field of biodiversity conservation. In early 1990s, the China Biodiversity Conservation Fund (CBCF) was set up, based on the former Milu Foundation. The CBCF reflected a significant change in the focus of conservation efforts, from individual species to the preservation of critical habitats and ecosystems. One initiative was a study of effective management of an ecosystem demonstration area in Huairou, Beijing, which greatly advanced the biodiversity conservation cause in Beijing.

Many institutions set up relevant data and information management networks in the 1990s. As one of the state's priorities in the Eighth Five-Year Plan, CAS initiated a five-year biodiversity program of key projects, including setting up the Biodiversity Research Information Management (BRIM) system. As a part of this initiative, the Endangered Species Information System has been greatly expanded and improved, as has the China Species Information System, which is now the largest for vertebrates in China.

In 1991 NEPA set up a biodiversity database. Data management guides were formulated, including a management plan for state biodiversity data and information. These guides promoted sharing and exchange of information among relevant agencies and establishing a biodiversity information network and an international biodiversity information exchange system.

National Biodiversity Conservation Action Plan

The beginnings of the NBAP were established before the CBD as a part of the GEF's China Biodiversity Project, which began in 1992 with the support of the World Bank. The project set out concrete objectives, priority actions and research projects and listed priority species and ecosystems to be protected.

The former State Council Environment Protection Committee (SEPC), under the auspices of the State Council, coordinated efforts to solve important environmental issues in China by providing guiding principles and evaluating relevant laws and policies. Because the National Environmental Protection Agency was responsible for managing and evaluating biodiversity conservation, it was appointed as the lead agency in coordinating the drafting of the National Biodiversity Action Plan. A NBAP Leading Group was formed with the NEPA Deputy Administrator appointed as its head. An Expert Team was responsible for planning, preparation of outlines, and compilation and editing of the text. Experienced Chinese scientists, working closely with conservation in the fields of ecology, zoology and botany, were involved in the group.

An International Advisory Group was formed to advise on the drafting of the plan. This group proved to be vital in linking international approaches with the realities in China.

In 1994, China's NBAP was officially launched by the State Council. It represented a joint effort of many government agencies and ministries and required cooperation from both the national and international community.

Stimulated by this initiative, other strategies and action plans also began during the process of NBAP planning. The Action Plan on Marine biodiversity (1992) focused on marine organisms and their distribution. China's Agenda 21 was officially adopted in 1994. Action plans for agriculture (1993), forests (1995), and Urban Flora (1994) were developed. Individual species action plans (e.g., for the panda in 1993 and for the Crested Ibis and South China Tiger in the early 1990s) were also instituted (see Chronology).

Scope and objectives

The overall goal and operational objectives of the NBAP were determined through intensive discussions among scientists and representatives from participating organizations and were defined as follows:

- set priorities and identify feasible measures to stop the destruction and loss of biodiversity and habitats;
- over the long term, save endangered species, conserve living resources, use natural resources rationally and sustainably, and restore ecosystems as much as possible; and
- offer scientific assistance in rural development in a way that promotes biodiversity conservation.

NBAP preparatory workshops

An initial series of NBAP preparatory workshops agreed on the main areas of focus. The first priority was strengthening the study of China's biodiversity, emphasising the measurement of its status and economic value. A bio-geographical system is needed to serve biodiversity conservation management.

The second priority was setting up a classification system and network of national parks and reserves. This will serve to evaluate the distribution of reserves and national parks, their management and representation, and whether they function according to the biosphere reserve model. At the same time, it is also necessary to identify and set up new reserves, to meet the goal of having ten per cent of state territory within protected areas.

The NBAP must also focus on the conservation and continued study of key protected species in China. Their study and protection needs to be enhanced through appropriate in-situ and ex-situ measures. An integrated conservation and development plan is also recommended.

Biodiversity in-situ outside reserves needs to be conserved through eco-agriculture, special protection of coastal and marine ecosystems, and demonstration biodiversity management areas. An information and monitoring network for biodiversity conservation must also be developed. It is important to improve regional information and monitoring for biodiversity conservation. This would be done by the collection of data of environmental and social significance and establishing effective monitoring techniques, which would facilitate the establishment of the state information and monitoring network for biodiversity conservation.

Finally, greater effort should be made to coordinate and integrate biodiversity conservation and sustainable development. This can be done by facilitating cooperation between local governments and communities and by combining biodiversity conservation with local community development through cooperative management and benefit sharing. The goal is to establish a system of biodiversity management zones; once set up, continuous effort will be required to consolidate and improve it.

NBAP development

The preparation of the NBAP was initially guided by the CBD, although numerous other international documents were also used as important references. The expert team based the plan's outline and the evaluation of present status and needs primarily on the CBD. The BWG and the World Bank's project manager were also consulted.

The process involved wide national and international participation through a series of workshops, working groups and expert advisory groups. The first NBAP Workshop, in February 1992, established the criteria for determining the biodiversity significance of species and ecosystems, nationally and internationally, and the priority for their conservation in China. The second BAP Workshop, in November of that year, assembled national and international experts on Chinese biodiversity for the first time. Participants reviewed the information requirements for the action plan, developed detailed lists of Chinese ecosystems and species of national and international significance, and assigned priorities for conservation action.

During a four-week session in February 1993, the results of November workshop and the separate drafts prepared by each member of the Leading Group were combined into a consolidated draft. The draft was reviewed and amended at the BAP Workshop in April 1993 and further reviewed and revised by national and international experts. It was subsequently approved by government.

The participating institutions each worked out tentative action plans, paying special attention to their function and responsibilities. These action plans were compiled into a first draft of the NBAP through a series of symposia and workshops. The draft NBAP was divided into four main parts: Biodiversity Status, Conservation Status, Objectives and Actions, and Implementation measures. Each of these was reviewed in group sessions. Three workshops were held to discuss and revise the complete text of the NBAP, which was then distributed to relevant institutions and interested parties for comment.

Soon after the NBAP was developed, a UNEP-supported project began a Biodiversity Country Study. Disagreement arose as to whether a Country Study was needed when an NBAP had been prepared. It was agreed that the Country Study would provide an overall review of the status of biodiversity with in-depth analysis of threats and existing conservation efforts and achievements, and a definition of further measures and actions needed. The NBAP and the UNEP Country Study were viewed as parallel programs with different purposes. The UNEP Country Study was completed and published in 1998.

While NEPA was the lead agency in organizing and coordinating the NBAP, many other institutions played critical roles in its development because of their respective responsibilities. CAS was responsible for the study of biological resources; it possesses the most comprehensive information on this topic and provides scientific advice to the State Council. The Ministry of Forestry (MOF) manages natural reserves, governs the import and export of flora and fauna, implements the Wildlife Protection Law, and formulates regulations for

conserving forest ecosystems. The Ministry of Agriculture (MOA) is in charge of protecting agricultural and grassland ecosystems and freshwater and marine fisheries as well as other aquatic species. The Ministry of Finance allocates funds for biodiversity conservation; the Ministry of Public Security assists in implementing Wildlife Protection Law and Environment Law, and enforces any law relating to illegal trade, hunting, and destruction of wildlife and habitats.

The Ministry of Construction oversees zoos, botanical gardens and national parks (scenic areas) and plays an important role in both in situ and ex situ protection and captive breeding programs. Only representatives of zoos and botanical gardens participated in the NBAP process, however.

Other agencies were involved in the development of the plan because of their work in resource management. The State Oceanic Administration (SOA) oversees the management and use of the marine environment; the State Planning Commission incorporates biodiversity conservation into state annual development plans and long-term strategies; and the State Science and Technology Commission is in charge of science policy and scientific research activities at the state level. Each of these organizations provided comments at different phases of the preparation and revision process.

While the views of university-based scientists and grassroots groups were solicited and considered in the drafting of the NBAP, only governmental agencies and experts contributed directly to formulation. Other sectors, such as business and local communities, were not directly involved in the process.

During NBAP development, relevant government agencies began to pay more attention to biodiversity conservation and sustainable use, although funding constraints limited the overall response. Many local government agencies continued to emphasize development over conservation, knowing little about the critical relationship between the maintenance of biodiversity resources and development. Conflicts often arose between local government and conservation agencies, which had to be resolved by higher authorities.

Relationship to development planning

As one of the follow-up actions to UNCED, the State Science and Technology Commission (SSTC) and the State Planning Commission (SPC) were designated to organise and draw up the Agenda 21 for China. This was followed by the preparation of sector Agenda 21s or Action Plans, involving biodiversity in nature reserves, wetlands, agriculture, marine and coastal areas, zoos and botanic gardens, as well as traditional medicine. The NBAP has been influential in helping shape these plans.

Elements of the NBAP have been picked up by many national research and development plans. The SSTC and SPC, as the major funding bodies for long-term research and development programs, considered the NBAP in selecting the country's five-year plan research projects. The projects on biodiversity information management, conservation and sustainable use of biodiversity, the preservation of genetic diversity, and ex situ conservation of endangered species of animals and plants are part of the key research programs in the Eighth Five-Year Program of CAS and SSTC. The National Science Foundation also supported the programs under the Ninth Five-Year Plan. During the last decade, the government, influenced by the NBAP process, has made major investments in forest conservation.

It is necessary to obtain support from society as a whole. Only when biodiversity conservation is integrated thoroughly in the state economic and social development plans will it receive adequate attention from all sectors and achieve its objectives. Agriculture, forestry, animal husbandry, fisheries, water management, medicine, construction, transport, finance and commerce all play an important role in biodiversity conservation and should vigorously work on its behalf. This cross-sector involvement should be reflected in economic development plans and addressed in related laws and regulations. All resource development should go forward on this basis.

But there is a challenge in defining the benefits of and economic incentives for biodiversity conservation. Owners and potential protectors of resources usually do not receive any compensation for taking conservation actions. In fact, direct economic benefits from other resource uses may be lost and living standards may deteriorate because of conservation efforts. The globalization of the economy often works against local conservation programs as well. Market forces cause accelerated pressure on biodiversity resources. If owners are not given adequate incentives, conservation objectives will not be achieved. Conservation should not be the sole responsibility of local people who depend directly on natural resources for their basic needs. Inequities quickly arise where one (usually distant) community becomes rich through aggressive exploitation of biodiversity resources, while another community (usually local) becomes poorer by conserving their environment.

Since biodiversity conservation is a cross-sector issue, all government sectors should contribute to the formulation and implementation of biodiversity action plans. For example, local governments should consider the NBAP when making their development plans. The NBAP strongly recommends that BAPs be prepared at the provincial level, although no province has taken this step or has been encouraged to do so. Many governors of provinces or towns are not

even aware of the existence of the NBAP. This is not surprising given the lack of consultation at the provincial level during NBAP formulation, and the scant publicity given to the process at this level. Nevertheless, some sectoral or thematic biodiversity action plans have been prepared.

Implementation

The NBAP team concluded that the most appropriate model for implementation was to have one supervising agency for coordination at all levels, with different local agencies taking on practical biodiversity conservation and management actions. In other words, one coordinating agency would be authorized by the state to work with different sectors, local government, NGOs, and the private sectors to enlist their close cooperation and participation in biodiversity conservation. The implementing agencies and organisations would share in the management and the benefits of biodiversity conservation. This model has not yet been put in place in China, which greatly inhibits systematic implementation.

A legislative framework for biodiversity conservation does exist. This legal system includes articles from the Constitution, national laws, administrative regulations and local regulations, laws and rules. The NBAP is recognised as a key part of the policy framework to conserve China's biodiversity.

China has achieved a great deal in biodiversity management through in-situ and ex-situ conservation, scientific research, public awareness and legislation. However, biodiversity conservation and sustainable use practices are still far from satisfactory due to the lack of a coordinating national agency and sufficient funding. There are 1,149 reserves, more than 170 zoos and animal breeding centres, 110 botanical parks and tree parks, and dozens of natural history museums and collections. However, effective management is lacking or inefficient because of a shortage of well-trained staff and funding. Some forest parks and scenic areas for tourism are not included in the list of protected areas, and are usually excluded in conservation planning or activities because of sectoral barriers and conflicts.

The main mechanisms for the implementation of biodiversity management include the following:

- reserves for in-situ conservation under the sectors of Forestry, SEPA, Agriculture, Oceans, Geology, and CAS;
- zoos and safari parks for public education and breeding of endangered species under the Ministry of Construction, the Ministry of Forestry and local government;

- breeding centres (mainly for threatened species) under Forestry and Construction;
- a gene bank mainly for crops under Agriculture and CAS, with CAS concentrating on endangered wildlife species;
- compensation measures (e.g., for ceasing to log natural forests, restoration of natural habitat, and wetland protection); and
- international cooperation

Monitoring and follow-up

The NBAP proposed that a monitoring mechanism determine whether allocated funds be used for the proposed actions and whether laws and regulations are consistent with the plan. Ministries and government agencies are responsible for implementing their portions of the NBAP. At the state level, SEPA has taken over the responsibility for monitoring, evaluating actions, and coordinating the sectors responsible for various aspects of biodiversity conservation (the State Council Environmental Protection Committee previously did this).

Environment monitoring stations focusing on pollution have been set up in all provinces of China; a similar network has been proposed for monitoring the health of ecosystems. The experimental field station network under CAS and some reserves are conducting the pollution monitoring, and, if authorized and strengthened, could carry out national ecosystem monitoring. There are no standard indicators or system of management and reporting, however, and information is fragmented, which limits the influence of monitoring results on development planning and decision-making.

Box 2. China's Report to COP 4

China submitted a national report, including a chapter on the NBAP, to CBD COP 4 in Bratislava. The formulation process and its main objectives and essential actions were highlighted, but it could not be considered a comprehensive review of NBAP implementation. No such review has been undertaken. As stated in the COP 4 report, the NBAP set out objectives for seven priority areas and 26 action options. It identified 18 projects for immediate implementation, according to importance, urgency and feasibility. High-priority protected ecosystems and important protected species were also identified in the NBAP. This initial framework for evaluation and revision of the plan is in place, but as yet, no commitment made to undertake such a review.

Lessons learned

The NBAP became a formal administrative process rather than one of open expert deliberation. Initially, it was suggested that an expert team from various disciplines and different parts of the country should prepare the NBAP. Some international experts with extensive knowledge of China were to be involved as well. The team would assess the status and problems of biodiversity and set priorities objectively and scientifically. At regular intervals, experts from various sectors would be invited to participate in formulation by providing views and information and comments on draft material. This approach was not followed. Instead, the project was conducted through administrative rather than scientific channels; each sector was asked to send official representatives to participate in the NBAP preparation.

The administrative approach led to conflict which was not readily resolved. Conflicts were created by improper administration and bureaucratic interference, and the role of the Expert Team and the views of experts were not adequately considered. In addition, confusion was created by the different views of the World Bank and the Chinese team toward administering the NBAP project. This could have been dispelled had the Expert Team met more often and been a more effective guide and arbiter.

Conflicts also arose among different sectors in preparing the NBAP, particularly in identifying high-priority areas linked to the allocation of funds in future implementation. This problem was partly alleviated through compromises reached by the Leading Group and/or the Expert Team.

Confusion was created by frequent change in personnel. Among other difficulties, the change of personnel within agencies during revisions of the plan caused inconsistencies from one version of the NBAP to the next.

There was little reliable information with which to set priorities. A lack of accurate scientific data and information, especially in the form of a national biodiversity database, made it difficult to get a clear picture of the current status of ecosystems and species, and consequently to set rational priorities for action. Three international workshops held during various NBAP phases proved useful in listening to experts' suggestions and recommendations.

Poor awareness and coordination within some sectors meant that key departments were not involved. Although the Ministry of Construction sent representatives, the appropriate departments were not always involved. The sections most involved with biodiversity issues deal with zoos, botanical gardens and national parks, and should play an important role in both in situ

and ex situ conservation. No representatives from the Ministry's department of national parks (scenic areas) took part, however. This led to a gap in the consideration of protected area issues. The reasons for this oversight were mainly limited understanding and poor coordination.

The links between biodiversity conservation and economic development are poorly understood. The main obstacle in NBAP formulation was the lack of awareness of the significance of biodiversity conservation to economic development. Most administrative agencies believed that biodiversity conservation was in direct conflict with economic development, which had a higher priority. They were not aware of the long-term benefits of biodiversity conservation to sustainable economic development. There was little understanding of the potential contribution of economic measures to biodiversity conservation. The underlying assumption was that natural resources were free goods which can be used without cost or compensation.

Many projects proceeded without consideration of the economic costs of environment degradation and protection. Many so-called profitable projects would not be cost-effective if they accounted for the effects on the environment and biodiversity resources. Many activities receive direct economic gain through the use or sale of natural resources, but do not have to pay for associated degradation or for lost opportunities in future or alternative uses of those resources. Examples include logging of natural forests, farming steep slopes and grasslands, stocking lakes for farming purposes, exploitation of plants for traditional Chinese medicine, harvesting of wild animals, inshore fisheries and introduction of alien species: all of these can have severe impacts on native biodiversity.

The state budget does not include allocations for biodiversity conservation. Of special ongoing concern is the lack of awareness by the central government, which still does not include allocations for biodiversity conservation in the state budget. Various sectors make provision for biodiversity conservation within their own discretional funds but these relatively small allocations do not meet the need.

Lessons learned during NBAP implementation

The NBAP requires regular review and revision but to date there has been little follow-up. The NBAP is a long-term program which needs to be a permanent part of government business, but its development and implementation has not been reviewed. One reason for this was uncertainty over whether to continue the NBAP Leading Group and Expert Team. Both these bodies ceased to function after the NBAP was launched. Also, the CBD Coordinating

Group has focused on CBD implementation in general rather than having specific responsibility for NBAP implementation.

Coordination of NBAP implementation is not a state function. NBAP implementation should be coordinated by a state-level supervising agency such as the former State Council Environmental Protection Committee as recommended in the plan. The committee, along with its successor, SEPA, does not operate under the council, which has made effective coordination of NBAP implementation difficult. SEPA lacks the necessary authority. Elevating coordination responsibilities to a higher administrative level still needs to be considered.

The lack of a detailed operational plan has limited progress. When the NBAP was launched, a detailed national implementation plan was needed as an operational framework by all arms of government. Since this did not happen, each sector implements the NBAP separately based on its own interpretation of priorities, focus, and financial situation. There has been little coordination in the context of a common annual plan, especially in cross-sectoral activities, monitoring and evaluation, exchange of experiences, and allocation of funding.

There are many gaps in the legal framework for biodiversity conservation. Improvement of legislation is vital for implementation of the NBAP. For instance, there is an urgent need to revise existing laws and to develop new laws or regulations governing species diversity, invasive species, improper introduction of species, animal welfare, in situ conservation of natural ecosystems and species diversity, or the sustainable use of biodiversity. Legislative provisions for strategic planning of protected areas is needed to improve the existing protected areas system and its management.

There is no consistent or adequate funding of NBAP implementation. Insufficient financial support is a basic problem in NBAP implementation. More funds should be allocated through the state budget to biodiversity conservation; increased support from individual government agencies, NGOs, the private sector and innovative forms of financing also needs to be explored.

Communications and education did not continued into the implementation phase. Public education and awareness of NBAP implementation should be increased; most forms of communication activities relating to the plan ceased once it was prepared. Effective implementation of the NBAP depends on a thorough knowledge of the importance of biodiversity resources and their management to long-term sustainable economic development. Government

officials and managers lack appreciation or understanding of their critical role in achieving conservation and sustainable use objectives.

Although considerable effort has gone into biodiversity conservation education, there is still a gap between what was recommended in the NBAP and what has been achieved. NGOs, through their conservation education programs, have the capacity to mobilise youth and the general public to assist the government in biodiversity conservation. They should be given more support and incentives. A long-term education program should be mounted for the public that includes decision-makers, governmental staff and the private sector.

There is a lack of up-to-date biodiversity inventories on which to base action. Implementation of the CBD and NBAP should be based on scientific data and information. Most protected areas, remaining forest blocks, new plantations, marine areas and rural habitats lack any form of biodiversity inventory to form the basis of sound management strategies. In most cases, sites for which data do exist have been greatly transformed since the original inventories were compiled. Much of the previously collected information is out of date or taxonomically imprecise. Moreover, because of sectoral barriers, the existing information on taxonomy, distribution, and habitat is not readily available or shared and has not been fully utilised. Chinese science universities do not have special taxonomy and field biology curricula. The shortage of taxonomy and field specialists is a key problem facing biodiversity studies in the country and NBAP implementation.

Recommendations

Undertake a thorough review of the NBAP. An overall evaluation of the formulation, implementation and impact of the existing NBAP should be carried out as a first step. Questionnaires could be disseminated to all levels of government and relevant agencies. The responses would determine the nature and focus of further consultations, including specific evaluations, seminars and workshops.

Prepare a national biodiversity strategy and action plan. Revising the existing NBAP to a state biodiversity strategy and action plan is vital for China to fill the gap between strategy and action. China initiated the formulation of its NBAP when the CBD was still being negotiated. At that time the emphasis was on setting priorities for immediate conservation actions rather than determining a broad policy framework for the action plan. China needs to build on more than seven years of NBAP implementation experience in defining

a national strategy which sets out comprehensive policies for implementing the CBD and provides the necessary guidance for extending action to the sectors and provinces.

Introduce a *National Biodiversity Act*. When completed, the strategy should be converted into legislation in the form of a *National Biodiversity Act*. The CBD provides a comprehensive approach to biodiversity management, which needs to be reflected in national and provincial legislation. Such legislation should incorporate new policy measures for implementing the CBD, including biodiversity conservation, sustainable use of biological resources, and the equitable distribution of benefits arising from such use.

Ensure adequate financing. The means of providing adequate resources for implementation should be included in the new Biodiversity Strategy and Action Plan, drawing on a wide range of funding mechanisms (ranging from admission fees to special taxes on natural resource use). Funding for biodiversity conservation should be itemized in the state annual fiscal plan.

Prepare regional BAPs. Regional BAPs are of great importance in a vast country like China. Many of the key actions in implementing the CBD need to take place at the provincial level, reflecting regional differences in biodiversity and decentralised responsibilities for resource management. The BWG recommended a program to prepare biodiversity strategies and action plans at the provincial level. For example, plans might cover certain provinces or bio-geologically significant regions, or be based on China's bioregions. These regional plans should be very practical, with concrete objectives and operational programs. They should define the roles for various economic sectors and outline the major activities needed to implement the CBD at the provincial level.

Plan preparation could be led by the Provincial Planning Commission and based on broad consultation with, and the active participation of all relevant sectors (including the provincial departments of forestry, agriculture, fisheries, marine affairs, tourism, science and technology, transport, energy, trade and education, in addition to the Provincial Environmental Protection Agencies and private enterprise).

While provinces would be free to address the biodiversity issues they consider most important, SEPA should provide guidelines to ensure adequate coverage and common approaches. The provincial strategies and action plans should reach the county and township levels. Each strategy/action plan should include a protected area system plan, links to key economic sectors, a funding

strategy that draws on a wide range of funding mechanisms and financial instruments, and any necessary changes in legislation. Systems for compensation and benefit sharing at local level should be detailed.

The provincial BAPs would set out the major policy directions for the province to ensure that biological resources are used sustainably and continue to play a critical role in the economic and social welfare of local people. During the process of development of regional or local BAPs, the BWG could advise the provincial biodiversity planners, providing technical and policy advice on request.

Extend the coverage and management of protected areas to the provincial level. China's protected area system is extensive and growing, but a more comprehensive approach is needed to ensure that all key habitats are covered, that the protected areas fit within a larger bio-regional land-use plan, and that major management issues are clearly identified. This will require greater responsibility at the provincial level.

Prepare a comprehensive operational plan. A clear implementation plan must be prepared following the formulation and promulgation of the NBAP. Human and financial resources should be channelled to the highest priority projects, for example extending the system and management of different types of reserves, forest parks and national parks. Administrative responsibilities should be clearly defined and budgets set accordingly. All implementation initiatives should be under unified coordination but managed separately. Biodiversity management regions should also be established with dynamic and flexible management that can adapt to local situations.

Establish a national coordinating body for biodiversity. Biodiversity conservation involves all sectors and there may be conflicts between different sectors over conservation and development initiatives. Traditional and improper division of responsibilities within institutions have led to the failure of relevant sectors to cooperate with each other over conservation initiatives, a situation which needs to be improved.

The NBAP requires a nationwide coordinating institution to ensure its effective implementation. In the short term, SEPA's capacity to manage implementation of the NBAP needs to be strengthened. Biodiversity is a complicated issue that cannot be the responsibility of any one agency; a national coordinating body should be set up under the State Council to supervise and coordinate implementation.

A biodiversity conservation body at the national level would coordinate all agencies concerned with the use and conservation of biodiversity resources. It would be the lead implementation agency for the CBD and NBAP. It should have legal, political and financial authority over nationwide biodiversity activities and be responsible for guiding and encouraging biodiversity conservation in China through policy-making and planning. Building on China's NBAP, the coordinating body should oversee the preparation of China's Biodiversity Strategy, which would establish the main policy directions for implementation of the CBD nationwide.

In addition to the CBD, many other international conventions relate to the conservation of natural resources and ecosystems, covering trade in endangered animals and plants, wetland conservation, migratory species, whaling, combating desertification, world heritage, climate change and the conservation of marine life. Their implementation involves different sectors and proper coordination among them is vital.

As an early priority, the national biodiversity planning and coordinating body should work with relevant agencies to bring together action plans, either existing or under development, which relate to biodiversity. These should be reviewed as part of the process to produce an authoritative National Biodiversity Strategy and Action Plan.

Develop follow-up thematic action plans. As part of the NBSAP process, it is vital to initiate action plans for important taxa of Chinese fauna and flora, such as primates, deer, bovines, wild cats, bats, River dolphin, panda, Crested ibis, cranes, pheasants and turtles. These action plans could be carried out in conjunction with updating the China Red Data Books and Red Lists in cooperation with the Species Survival Commission of IUCN.

It is also important to prepare thematic action plans covering critical ecosystems and conservation issues, such as forests and reforestation, wetlands, mangroves, coral reefs, grasslands; invasive species, the national system of protected areas, and ex-situ conservation and captive breeding.

Chronology

Year	Event	Lead agency	Comments
1979	Regulations about Aquatic Resources Conservation	MOA	Includes freshwater and marine species
1982	Marine Environmental Protection Law	SOC	
1983	The State Council's General Order of Strictly Protecting Rare Wild Animals	State Council	Protects wildlife species especially endangered or rare
	Plant Quarantine Regulations	MOA	
1984	Forest Law	MOF	
1985	Grassland Law	MOA	
	Temporary Regulations on Management of Scenic Spots	MOC	
1986	Fishery Law	MOA	
	National Conservation Strategy	NEPA	First approach to a national strategy; follow-up to WCS
1986	Regulations for the Implementation of the Forest Law	MOF	
1987	Regulations for the Implementation of the Fishery Law	MOA	
	Regulations about Protection and Administration of Wild Medicinal Material Resources	SACTM	
1988	Wildlife Protection Law	MOF	Forestry and fishery implement terrestrial and aquatic species accordingly
	Regulations for the Imple -mentation of the Forest Law	MOF	
	Regulations about Control of Forest Fires	MOF	

1989	Regulations about Seed Management	MOA	
	Environmental Protection Law	SEPA	
	Regulations about Control of Forest Pests	MOF	
	State Protected Wildlife Species List	MOF, MOA	Includes species protected by State Wildlife Law
1989–2000	National Plan for Afforestation 1989-2000	MOF	A 12-year afforestation plan
1990	Biodiversity Working Group (BWG)	CAS	Organizes research programs, cooperates with institutions
	Decision on Further Strengthening Environment Protection	State Council	Strengthens resources management and ecological for better nature conservation
	Symposium on Biological Diversity, Chinese Academy of Sciences	CAS/Dept. Bio-sci. and Bio-technol.	First academic symposium organized by CAS's BWG
1991	China Biodiversity Conservation Action Plan	UNDP/UNEP/ GEF and NEPA	Action planning at the state level involving all related sectors and institutions
1991	Animal and Plant Entry and Exit Quarantine Law	MOA	Domestic and international quarantine issues
	Water and Soil Conservation Law	MOWC	
	Caring for the Earth	IUCN	
1991–1992	Inter-governmental negotiation on CBD	MoFA, NEPA	Chinese delegation involved in negotiation on the formulation of the CBD draft
1991–1996	Biodiversity Conservation Program, 8th Five-Year Plan	CAS, SSTC, WB	Research programs organized by BWG
1991–2000	National Plan for Desertification Control	MOF	
1992	Biodiversity Conservation in Forestry Action Plan	MOF	Assessed forest biodiversity assessed existing policies; proposed future initiatives

	UNCED (Rio)	UN	Attended by a governmental delegation from China
	Biodiversity in China: Status and Conservation Needs	Biod. Comm./CAS	Introduction; with key recommendations; scientific documentation for UNCED
	China Council for International Cooperation on Environment and Development (CCICED)	State Council	Senior advisory body with members from China and international community; follow-up to UNCED
	China Plant Red Data Book: Rare and Endangered Plants	Inst. of Botany, CAS	Compilation of rare and endangered species of flora
	Action Plan of Marine Biodiversity Conservation in China		SOA Follow-up action plan; included recommendations
	Regulations on Afforestation in Urban Areas	MOF	
	Regulations Regarding the Protection of Terrestrial Wild Animals	MOF	Measures and procedures under Wildlife Protection Law
1993	Regulations for the Protection of Aquatic Wild Animals	MOA	Measures and procedures under Wildlife Protection Law
	Plan for ex-situ conservation of giant pandas	MOC	Included detailed implemention plan
1993	Biodiversity Working Group (BWG)	CCICED	Chinese and international experts review, evaluate and make recommendations
	Action Plan for Agriculture Biodiversity Conservation	MOA	Follow-up to NBAP; defines agricultural eco-systems, germplasm resources and aquatic product resources.
	Administrative Regulations about Prevention of Pollution and Damage of Marine Environment by Seashore Construction Projects	SOA	
1993–1998	National Program for Environmental Protection	NEPA	Management of nature reserves, NBAP implementation; ecological recovery.

1994	Regulations about Nature Reserves	NEPA	
	China's Agenda 21 for Environmental Protection	NEPA	Reviewed past development, analyzed problems and made proposals
	China Agenda 21	State Council	Adopted by government
	National Biodiversity Conservation Action Plan	State Council	Officially adopted by govern ment; published in both Chinese and English
1995	Ninth Five-year Plan for the Agricultural Environment Conservation for 2010	MOA	Genetic resources, nature reserves, ecological agri-culture and environmental monitoring in agriculture
	Forestry Action Plan for China's Agenda 21	MOF	Forestry development in the 21st century
	Ninth Five-year Plan and Planning for 2010 for Chinese Medicine	Traditional Chinese Medicine Department	Breeding and production techniques; education and awareness; sustainable use; public participation
1995–1996	Action Plan of Conservation and Management of Mangrove Ecosystems in China	SOA	Strengthened mechanism for protecting and managing mangroves
1995–2001	Nature Reserve Management Program	MOF/UNDP/WB/GEF	Reserves in forested areas and wetlands
	Plan for the Centralized Conservation of Urban Rare Flora Species	MOC	Collection and protection centres for botanical plants across China.
1996	Conservation Plan for South China Tiger	MOC	Measures to prevent catching and killing; nature reserves to protect habitat, study of its habits; artificial propagation.
	Regulations on Protection of Wild Plants		
	China Ocean Agenda 21	SOA	Marine nature reserves and protected areas; biodiversity environmental protection.

	Biodiversity Review of China	WWF	
	National Ninth Five-year Plan for Forestry and Long-term Program for 2010	MOF	Guiding principles, basic policy, goal, tasks; implementation
	4th National Environment Protection Congress	State Council	
1996	Biodiversity Action Plan in the Dept. of Agriculture	MOA	
1996–2000	China Trans-century Green Projects Plan	NEPA	Collaboration with SPC and SETC; 1600 projects for first phase (1996-2000)
1996–2010	China Development Planning Program for Marine Nature Reserves	SOA	Planning and principles; management plans; survey and zoning of resources
1996–2050	National Plan for Forest Ecological Construction	MOF	Principles, strategic goal and key projects; funding estimates, plan implementation
1997	*Conserving China's Biodiversity*	BWG/CCICED	Reports and selected papers
	China joins IUCN as a State Member	State Council and MOFA	New step in international cooperation in conservation
1998	China's Biodiversity: A Country Study	SEPA	UNEP project, overview of biodiversity status in China
1998–1999	China *Red Data Books*: Mammals, Birds, Herps, Fishes	NEPA, CAS	Information and data on endangered species; scientific background for planning and implementation of domestic laws, international treaties
1999	Conserving the World's Biodiversity (Chinese version)	Biod.Comm./ CAS	Communicating international progress in conservation within China
	BWG's Key Recommendations to China's 10th Five-Year Plan	CCICED	Seven key recommendations on biodiversity conservation and sustainable development
1998	Action Plan for Implementing the United Nations Convention to Combat Desertification	MOF	

Endnotes

1. Examples include WWF, IUCN, World Bank, UNDP, UNEP, GEF, McArthur Foundation and Wildlife Conservation Society (WCS).

2. This law specifies economic and technical policies, institutional arrangements, conditions for establishing protected areas, application procedures, examination and approval processes, nomenclature and internal composition, authority to formulate technical criteria and standards, responsibilities of administrative institutions, administration measures, and penalties for violation for nature reserve management.

3. The Group was convened by NEPA and had representation from the Ministries of Foreign Affairs, Finance, Science and Technology, Forestry (now the State Forestry Bureau), Agriculture, Education, Construction, State Planning Commission (SPC), State Oceanic Administration (SOA), State Administration of Traditional Chinese Medicine, Chinese Academy of Sciences (CAS), State Patent Administration, Ministry of Public Security and the Customs Administration.

References

Chen, L., X. Wang and S. Wang, eds. 1993. *Chinese Biodiversity: Status and Conservation Strategy.* Science Press, Beijing. (in Chinese)

Institute of Botany, CAS. 1992. *China Plant Red Data Book: Rare and Endangered Plants.* Beijing and New York: Science Press.

MacKinnon, John and Nigel Hicks. 1996. *Wild China.* New Holland.

MacKinnon, John, et al. 1996. *A Biodiversity Review of China.* WWF-Int'l, WWF China Program, Hong Kong.

Ministry of Forestry. 1995. *China's Agenda 21 — Forestry Action Plan.* Beijing: China Forestry Press.

Ministry of Agriculture. 1996. *China Biodiversity Action Plan in Agricultural Departments.* Beijing: China Agriculture Press.

National Environmental Protection Agency. 1994. *China Biodiversity Conservation Action Plan.* Beijing: China Environmental Science Press.

National Environmental Protection Agency. 1987. *China Conservation Strategy*. Beijing: China Environmental Science Press.

National Environmental Protection Agency, et al. 1998. *China Biodiversity Country Study.* Beijing: China Environmental Science Press.

State Oceanic Administration. 1996. *China's Ocean Agenda 21.* Beijing: China Marine Press.

State Planning Commission, et al. *China's Agenda 21: A White Paper on Population, Environment and Development in the 21st Century.* Beijing: China Environmental Sciences Press.

Wang Sung (ed.). 1992. *Biodiversity in China: Status and Conservation Needs.* Biodiversity Committee/CAS. Beijing and New York: Science Press.

Wang, Sung (ed.). 1990. *Proceedings of the Symposium on Biological Diversity, 29-31 March, 1990, Beijing.* Biodiversity Working Group/Bur. Bio-Sci. and Tech., CAS. Beijing. (in Chinese)

WCMC. 1992. *Global Biodiversity.* London, Glasgow, New York, Tokyo, Melbourne, Madras: Chapman and Hall.

Appendix 1. Major laws, measures and regulations for conserving biodiversity

Constitution 1982

Laid down by the Notional People's Congress, is the fundamental law of China and provides a legal basis for making other laws. Article 9 of the Constitution provides that the "State ensure rational utilisation of the natural resources, protect are animals and plants, and prohibit any forms of encroachment and damage of the natural resources by any groups or individuals." Article 26 provides that the "State shall protect and improve the people's living environment and ecological environment and control pollution and other public nuisance; organize and encourage afforestation and protection of trees".

Laws

Marine Environmental Protection Law (1982); Forest Law (1984); Grasslands Law (1985); Fishery Law (1986); Wildlife Protection Law (1988); Environmental Protection Law (1989); Water and Soil Conservation Law (1991); Law on Quarantine of Imported and Exported Animals and Plants Supplementary Rules about Punishing Crimes for Hunting Rare and Endangered Wild Animals of National Priority Protection

Administrative Regulations

Regulations about Aquatic Resources Conservation (1979); Plant Quarantine Regulations (1983); The State Council's General Order of Strictly Protecting Rare Wild Animals (1983); Temporary Regulations on Management of Scenic Spots (1985); Regulations for the Implementation of the Forest Law (1986); Regulations for the Implementation of the Fishery Law (1987); Regulations about Control of Forest Fires (1988); Regulations about Control of Forest Pests (1989); Regulations about Seed Management (1989); Regulations about Protection and Administration of Wild Medicinal Material Resources (1987); Administrative Regulations about Prevention of Pollution and Damage of Marine Environment by Seashore Construction Projects (1983); Regulations on Afforestation in Urban Areas (1992); Regulations Regarding the Protection of Terrestrial Wild Animals (1992); Regulations for the Protection of Aquatic Wild Animals (1993); The State Council's Decision on Further Strengthening Environmental Protection (1990); Regulations on Management of Breeding Livestock and Poultry (1994); Regulations about Nature Reserves (1994); Regulations Regarding the Nature Reserves of the P.R.C. Regulations on Protection of Wild Plants (1996); The State Council's Decision on Several Environmental Protection Issues (1996)

Local regulations and laws

Formulated by provincial Peoples' Congresses (autonomous regions and municipalities directly under the central government) and their standing committees. For example: Enforcement Regulations Regarding Management of Forests in Guangdong Province Regulations about Management of Grasslands in Inner Mongolia Provisional Rules Regarding the Protection of Rare and Endangered Wild Plants in Liaoning Province Provisional Rules Regarding Management of Wildlife in Jilin Province Regulations on Nature Reserves in Zhejiang Province

Rules

Drawn up by relevant departments in charge of the Rules of the State Council and that of provincial governments, for instance:
SFA: Rules about Management of Nature Reserves for Forests and Wild Animals Regulations about Some Issues Concerning Strengthening Management of Forest Resources Rules for the Implementation of the Plant Quarantine Regulations
MOA: Rules for the Implementation of the Plant Quarantine Regulations Report on Preventing Uncontrolled Collection of Hair grass and Licorice to Protect Pasture Resources
Ministry of Foreign Trade and Economic Cooperation: Circular about Ceasing Purchasing and Exporting Rare Wild Animals
SOA: Rules about Management of Marine Nature Reserves
General Customs Administration and MOA: Circular about Strengthening Supervision and Management of Passengers Carrying Animal and Plant Specimens Abroad
SFA and MOA: State Key Protected Species List of Wildlife
SPC: Circular about According to Law Severely Punishing Criminals Hunting Panda and Illegally Dealing in and Smuggling Panda Hides
SPC, the Supreme People's Procuratorate, SFA, the Ministry of Public Security and the State Administration for Industry and Commerce: Circular Regarding Cracking Down on Crimes of Illegal Hunting, Purchasing and Selling Wild Animals