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Yiyu Chen · Beate Jessel
Bojie Fu · Xiubo Yu
Jamie Pittock *Editors*

Ecosystem Services and Management Strategy in China

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Preface

The earth's ecosystems have long provided the necessary services for the sustenance of humankind. Today, as the global population has reached unprecedented levels and in a common world economy, the status of the ecosystems – the natural foundation for human livelihoods – is threatened and in need of restoration and conservation. The Millennium Ecosystem Assessment (2005) provided a critical assessment of the earth's ecosystems over the past 50 years and concluded that many of the ecosystem services have reached their critical thresholds. Subsequently, ecosystem management has become increasingly relevant globally as mutual efforts are being put in place to sustain the benefits of ecosystem services for human well-being.

The ecosystem services concept has considerably evolved in recent years and has resulted to a new framework that combines ecological, social and economic considerations for better informed and harmonious decision-making. This framework is highly relevant to China, where the high rate of economic growth has put significant pressure on ecosystems. In fact, recent estimates put the cost of Environmental Degradation in China at 9 % of the Gross National Income for the year 2008.

Understanding its situation, China has put a lot of emphasis on ecosystem management and has the finest network for ecosystem management in the developing world today. However, continuing economic growth exerts pressure on China's ecosystems and innovative approaches are required to achieve China's goal of an ecological civilization.

Therefore, it is important now than ever before to apply the ecosystem management framework to achieve a more sustainable development goal for ecological civilization. The China Council for International Cooperation on Environment and Development (CCICED), established in 1992 has played a critical role in advancing thoughts on sustainable development in China. Its work has formed the basis for considerable policy action through case study assessments and scenario planning. Specifically, CCICED established a Task Force on Ecosystem Services and Management Strategy focused on forests, grasslands, and wetlands. The aim was to demonstrate the economic and social benefits of sustainable ecosystems management, identify best practices, and present recommendations and policy options for integrating ecosystem services into national development plans. The task force

prepared the study report ‘Ecosystem Services and Management Strategy in China’, which forms the basis for this book.

This book prepared from the study report provides readers with a comprehensive view of China’s ecosystem management practices and policies, future trends, and policy recommendations. This is relevant to both Chinese and international scientists as issues faced by much of the developing world in areas such as ecosystem degradation are similar. The book fulfills the following objectives:

- Assesses the benefits of sustainable ecosystem management based on an ecosystem service approach
- Identifies best practices in ecosystem management from Chinese and international experiences
- Recommends how to better integrate ecosystem services into development planning in China

The authors of this book had the overall responsibility of coordinating and drafting the final text. However, the book itself has received contributions from all Task Force members. Jamie Pittock and Luguang Jiang contributed to Chap. 1. Shidong Zhao and Yihe Lü contributed to Chaps. 2 and 3, respectively. Chapter 4 has a large number of contributors including Lailai Li, and Leon Braat contributed to the sections *Introduction*, *Summary*, and *Major findings and conclusions*. Guangchun Lei, Leon Braat, Eric Arets, and Peter Verburg contribute to the *Assessment methodology* section. The *Key findings and results* section received contributions from Junguo Liu, Luguang Jiang, Zemeng Fan, Wenman Liu, Honglin He, and Xiaofang Sun. Chapter 5 received contributions from Xiubo Yu in respect of selection and drafting of the case study on CERN. The case study on Poyang Lake received contributions from Guangchun Lei. Bojie Fu and Yihe Lü contributed to the case study on Loess Plateau. Baoxing County case study received contributions from Yukuan Wang and Daiqing Li. Chapter 6 received contributions from Nordin Hasan. Chapters 7 and 8 received contributions from us, Bojie Fu, Xiubo Yu and Jamie Pittock.

We are very grateful for all the contributions from related organizations and individuals.

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Executive Summary

Ecosystem services are the benefits that nature provides for people. The development of the ecosystem services concept over the past decade has resulted in a new framework that combines ecological, social and economic considerations for better informed and harmonious decision-making. The China Council on International Cooperation for Environment and Development established a Task Force on Ecosystem Services and Management Strategy focused on forests, grasslands and wetlands. It aimed to (a) show the economic and social benefits of sustainable ecosystem management based on an ecosystem services approach; (b) identify best practices locally and internationally; and (c) present recommendations and policy options for integrating ecosystem services into national development plans.

China is enjoying a period of massive economic growth in its quest to establish an ecological civilization. There have been tremendous gains, such as food security and poverty reduction. However, this economic growth is fuelled by unsustainable exploitation of natural resources with consequences for environmental degradation and further limiting growth. To avoid negative externalities and socio-economic impacts, better ecosystem management is required to sustain the ecosystem services that underpin quality of life and the economy in China. To help achieve the objectives of the *Scientific Outlook on Development*, the Task Force recommended that the Chinese Government:

1. Adopt a new *National Plan on Ecological Conservation and Development* to guide and integrate sectoral and regional measures

To provide a mandate and guide consistent ecosystem management across China, a new *National Plan on Ecological Conservation and Development* is needed, one that is based on the *National Plan on Eco-environmental Development* and the *National Guideline on Ecological Conservation*. This new plan should establish a comprehensive assessment mechanism for the maintenance of ecosystem services within the national development planning. This would provide a comprehensive basis for mainstreaming environment into development planning across sectors,

regions and key river basins by implementing the principles of the ‘ecosystem approach’ of the *Convention on Biological Diversity*. This would be overseen by a leadership group and expert panel.

2. Improve generation of ecosystem services from forests, grasslands and wetlands through sustainable management in priority regions

Diverse measures and policy instruments are required to improve ecosystem services from across China and we identify regional priorities. It is very important to balance supply of different ecosystem services and public interests, in particular, balancing generation of provisioning and regulating services so that decisions taken for social or financial benefits do not compromise the long-term health of ecosystems. Management of forests should be enhanced by improving the quality as well as the area of secondary forests, while strictly protecting the remaining natural forests from conversion into other types of land uses. Renewed efforts are needed to stop and reverse degradation of grasslands, particularly through better livestock management. Enhanced conservation measures are required for wetlands, in particular, expansion of nature reserves, provision of environmental flows, and management of overfishing. More effective regulations for nature reserves are needed. Specifically, more efforts are needed in western and central China for forest, grassland and wetland conservation and restoration.

3. Establish effective coordination institutions for sustainable ecosystem management at central, provincial and county levels, and to increase public participation

The success of ecosystem management largely depends on enhancing coordination mechanisms within and between different levels of government in ecological conservation and development, and fully leveraging the role of social groups in ecosystem management. To promote effective ecosystem management, it is essential to establish coordination agencies at the provincial level to facilitate cross-sectoral coordination and cooperation, whereas at the local and county level stakeholder involvement will be essential for implementing integrated ecosystem management. Positive examples, such as the Mountain-River-Lake Office of Jiangxi Province and the ecosystem management system of Baoxing County, Sichuan Province, can be replicated in other jurisdictions.

4. Promote the establishment of eco-compensation mechanisms and long-term investment in ecosystem conservation and management

Government investments and financial compensation for land managers has played a decisive role in the restoration of forest, grassland and wetland areas. As it takes decades to improve the condition and management of ecosystems, long-term investment is required to build on the initial work. Ecological conservation and restoration programs need to be expanded, in particular, in the ecologically and biologically sensitive areas in central and western China with a focus on the river source areas. These regions are vulnerable to severe water or wind erosion, which happen to be key source areas for drinking water and nature reserves. The

compensation rate for managing non-commercial forests should be raised to the same level as for conversion of cropland to forest. Rural stewards of ecosystem services need incentives, with payments from urban users for market-based services (eg. water), and state compensation for non-market services (eg. flood regulation). A new regulation of the State Council on eco-compensation is needed to guide such investments.

5. Strengthen ecosystem monitoring, long-term research and training for better knowledge-based support of ecosystem management

Projects like reforestation of large parts of the Loess Plateau have shown how science and long-term research contribute to successful ecosystem management. However, major new challenges and risks are emerging that affect China's national interests and development in the long run. Examples include the impacts of climate change and the opportunities to sequester carbon, and the emerging debate over excess emissions of reactive nitrogen into the environment from agriculture and fossil fuel combustion. These challenges and risks can best be managed by investing in sound, nation-wide, long-term research and monitoring. A regular national ecosystem inventory is proposed to inform the development of national 5-year plans. Enhanced measures are recommended for managing climate change, and for education and training in ecosystem management.