

Series Case Studies on the Sustainable Management of Biosphere Reserves in China
中国生物圈保护区可持续管理案例研究丛书



MANAGEMENT OF THE DEGRADED ECOSYSTEMS
IN XILINGOL BIOSPHERE RESERVE

锡林郭勒生物圈保护区

退化生态系统管理

韩念勇 蒋高明 李文军 主编



清华大学出版社

<http://www.tup.tsinghua.edu.cn>

Series Case Studies on the Sustainable Management of Biosphere Reserves in China
中国生物圈保护区可持续管理案例研究丛书



MANAGEMENT OF THE DEGRADED ECOSYSTEMS
IN XILINGOL BIOSPHERE RESERVE

锡林郭勒生物圈保护区 退化生态系统管理

韩念勇 蒋高明 李文军 主编



清华大学出版社

<http://www.tup.tsinghua.edu.cn>

(京)新登字 158 号

内 容 简 介

本书对锡林郭勒生物圈保护区草场退化的现状、原因以及从可持续利用和发展的角度提出可能的解决途径和草地生态系统的管理办法。本书用中文和英语撰写,前一部分为中文部分,后一部分为英文部分。全书分为 8 章,前 2 章描述锡林郭勒生物圈保护区建立之初的背景及目前所面临的问题;第 3 章至第 5 章用可持续利用和发展的观点阐述生态旅游和城镇化替代畜牧业的可行性;后 3 章为保护区的管理提出建议。

图书在版编目(CIP)数据

锡林郭勒生物圈保护区退化生态系统管理/韩念勇,蒋高明;李文军主编. —北京:清华大学出版社,2002

(中国生物圈保护区可持续管理案例研究丛书)

ISBN 7-302-05508-4

I. 锡… II. ①韩… ②蒋… ③李… III. 草地—生态环境—环境保护—研究—锡林郭勒盟 IV. X171.4

中国版本图书馆 CIP 数据核字(2002)第 030990 号

出版者: 清华大学出版社(北京清华大学学研大厦,邮编 100084)

<http://www.tup.tsinghua.edu.cn>

印刷者: 北京四季青印刷厂

发行者: 新华书店总店北京发行所

开 本: 787×1092 1/16 **印张:** 18.75 **字数:** 424 千字

版 次: 2002 年 6 月第 1 版 2002 年 6 月第 1 次印刷

书 号: ISBN 7-302-05508-4/X·39

印 数: 0001~1000

定 价: 38.00 元

《锡林郭勒生物圈保护区退化生态系统管理》

编委会成员

主 编：韩念勇 蒋高明 李文军

执行编委：刘美珍

编委会成员(以姓氏的拼音为序)：

陈佐忠 Alex English 郭志芬 蒋高明

韩念勇 黄甘霖 李文军 李 巍 刘美珍

苗 河 Rik Thawaites 仝 川 杨贵卿

雍世鹏 雍伟义 张 倩 赵炳祥

The Editor Boards of Management of the Degraded Ecosystems in Xilingol Biosphere Reserve

Editors-in-chief: Han Nianyong Jiang Gaoming Li Wenjun

Executive Member: Liu Meizhen

Editor Members:

Chen Zuozhong	Alex English	Guo Zhifen
Jiang Gaoming	Han Nianyong	Huang Ganlin
Li Wenjun	Li Wei	Liu Meizhen
Miao He	Rik Thwaites	Tong Chuan
Yang Guiqing	Yong Shipeng	Yong Weiyi
Zhang Qian	Zhao Bingxiang	

序 一

自从 1956 年建立第一个自然保护区以来,到 2000 年底,我国有各类自然保护区 1276 个,占国土面积的 12.44 %。其中国家级 155 个,世界生物圈保护区 21 个。这是一个令全世界瞩目的成就。这些保护区的建立无疑为保存我国丰富的自然资源做出了巨大的贡献。中国的自然生态系统由于历代开发消耗、灾害损坏、战火破坏,尤其是近几十年来人口剧增,能够保存到今天实属不易,这是我国经济可持续发展赖以实现的重要自然资源基础,对它们的保护刻不容缓。自然保护区就是就地保护人类赖以生存的生物多样性和自然生态系统,世界上许多发达国家都把自然保护区的建设管理水平作为社会文明与环境健康的重要标志。因此,自然保护区事业是既造福于当代,又给子孙后代留下宝贵自然遗产的“积德”事业。

但是在我国的大部分地区,甚至是在自然保护区内,生态系统面临的严重问题是它们的退化,从而造成的生态系统生物生产力的下降、结构的简单化以及功能的丧失。如果我们回顾一下历史可以对这个过程看得很清楚,比如今天的陕、甘等严重的沙化、荒漠化地区,在历史上曾经是植被良好的富庶之地,否则周(公元前 1066—公元前 221)、秦(公元前 221—公元前 206)、汉(公元前 206—公元 220)、唐(公元 618—公元 907)等 13 个朝代就不会在陕西建都。生态系统退化的治理需要一代人甚至几代人的努力。然而,我国的大部分经济欠发达的地区,尤其是西部地区,如不立即停止普遍存在的低效益、高破坏性的社区发展模式,如陡坡开垦、过度放牧、围湖围海造田、竭泽而渔等,则很难在短期或中期有所作为。因此,对于退化生态系统的恢复,正确对待人与自然的关系非常重要,否则的话,任生态系统退化下去,还会诱导其他严重的生态环境问题,如黄河断流、长江洪水泛滥、荒漠化扩大、沙尘暴频次加大、水土流失、病虫害爆发、山体滑坡、泥石流、干旱化加重,等等。现在,国家正在很多地区实施天然林保护工程、退耕还林还草工程、自然保护区工程等措施,旨在逐步恢复退化的生态系统,改善环境。自然保护区在这些退化生态系统恢复与生态建设当中,应当发挥其重要的作用。由于我国自然保护区的 40% 位于西部地区,25% 位于贫困地区,在这些地区的自然保护区中,生态恢复管理的问题更严峻、更现实。

自然保护区面临的普遍问题是如何解决保护与发展之间的巨大矛盾。这个矛盾解决不好,就会造成生态系统的退化,社区的经济与文化水平难以提高。在这方面,生物圈保护区的概念就是一个创造。这个概念是由联合国教科文组织(UNESCO)人与生物圈计划(MAB)的一个工作小组于 1971 年提出的,获得了联合国环境计划署(UNEP)、联合国

粮农组织(FAO)以及国际自然保护联盟(IUCN)的赞同,并于1976年开始实施。生物圈保护区的目标是使全球的典型陆地或海洋生态系统类型既要具有保护功能,又要促进可持续发展,并且有强大的后勤支持功能,从而科学地解决长期以来保护与发展之间存在的矛盾。自1979年以来,我国已有21个保护区加入世界生物圈保护区网络。世界生物圈保护区的建立,为国家的其他类型保护区的管理起到了重要的示范作用。尽管如此,由于国家对世界生物圈保护区管理缺乏有效的投入,同其他类型的保护区一样,世界生物圈保护区也存在生态系统退化、与经济发展脱节、管理理念落后等问题。为了解决这些问题,有必要对具体的保护区进行解剖分析,寻找相应的对策。为此,中国人与生物圈国家委员会发起了系列案例研究,锡林郭勒生物圈保护区是该项研究的第一个案例,其研究成果中提到的一些对策和建议,如对内蒙古大范围生态退化的防治、正确处理城镇与自然保护区的关系、发挥生态旅游在经济发展中的替代作用以及建立有效的保护管理体系等观点,不乏创新之意。因此,在这一研究成果出版之时,我非常愿意为此书写点什么,并希望能够引起有关方面的重视。是为序。

许智宏

中国人与生物圈国家委员会主席

中国科学院院士

北京大学校长

2002年3月10日

FOREWORD I

Since the establishment of the first nature reserve in 1956, China had proclaimed further 1276 nature reserves by 2000, occupying 12.44% of the nation's territory, including 155 national-level reserves and 21 world biosphere reserves. This accomplishment has attracted the attention of the whole world. The establishment of these nature reserves has without a doubt made a tremendous contribution towards preserving China's rich natural resources. As a result of natural and manmade disasters and destruction from war during the previous dynasties, China's natural ecosystem has been seriously depleted. In particular, this depletion has witnessed a marked increase during the past several decades due to sharp population increase. Therefore the task of preserving China's remaining natural resources is not easy. However, it is essential to immediately protect the foundations of the nation's important natural resources to ensure the sustainable development of the economy. These nature reserves ensure the survival of humanity by protecting the biodiversity and the natural ecosystem of local areas.

The establishment and management of quality nature reserves in many developed countries symbolize the modernization of society and the health of their environment. Therefore, the "benevolent" undertaking of nature reserves to preserve our precious natural heritage will not only benefit the current generation, but also future generations. However, China's ecosystem is confronted by the serious problem of degradation throughout the country and even within her nature reserves. As a result of this degradation, the strength of the ecosystem has been reduced causing a simplification of the structure and a loss of its function. It is possible to clearly see this process at work by reviewing the historical experience, for instance the serious areas of degradation and desertification today in Shaanxi, Gansu and other regions. Historically, these regions contained rich and popular wilderness areas. As a result, Shaanxi was home to the capitals of 13 Chinese dynasties, including the Zhou(1066BC—221BC), Qin(221BC—206BC), Han(206BC—220) and Tang(618—907). However, the current degradation of the ecosystem may possibly require more than just one generation or even several generations of hard work from the government. Moreover, many regions throughout the country still

lack economic development, especially the western regions.

If we are unable to cease the highly destructive activities to social development such as the reclamation of steep slopes, over-grazing, the reclamation of lakes and coastal areas for cropping and the exhaustion of fishing stocks, etc., then it will be very difficult to achieve such benefits in the short to medium term. Consequently, it is essential that we correctly deal with the relationship between man and nature if we want to restore the degraded ecosystem. Otherwise, if the degeneration of the ecosystem continues to worsen, then more serious repercussions will develop, for example, the drying up of the Yellow River, desertification, an intensification of sandstorm occurrence, soil erosion, the eruption of serious disease, landslides, land slips and droughts etc. Currently, many districts are implementing natural forest protection projects, the return of farmland to forests and grasslands projects, and nature reserve projects etc. Nature reserves should play an increasingly vital role in the restoration and protection of these degraded ecosystems. Due to the fact that 40% of China's nature reserves are located in the underdeveloped western regions and 25% are located within impoverished areas, the problem of restoring the ecology and management of these areas is of utmost seriousness and of the highest priority.

In general all nature reserves are confronted with the enormous problem of resolving the contradiction between development and conservation. If this contradiction is poorly resolved, it will only lead to more serious degradation of the ecosystem and therefore make the task of improving the economic and cultural level of society more difficult. In addressing this problem, the biosphere reserve concept is one possible creation. This concept was proposed and launched in 1971 by one of UNESCO's (United Nations Educational, Scientific and Cultural Organization) working party's, the Man and the Biosphere Programme (MAB). With the endorsement of the UNEP (United Nations Environment Program), FAO (World Food & Agricultural Organization of the United Nations) and IUCN (The World Conservation Union), the programme commenced in 1976. The aim of biosphere reserves is to ensure the global coverage of representative terrestrial and marine ecosystems, which offer distinct conservation functions, as well as promote sustainable development. Moreover, they promote a logistic function and thereby attempt to scientifically resolve the long-term contradictions which exist between conservation and development. Since joining the World Biosphere Reserve Network in 1979, China has already successfully nominated 21 member reserves.

The establishment of these biosphere reserves plays an important demonstration role for improving the management of other nationally significant nature reserves. Still, as a result of ineffective investment in the management of China's biosphere reserves, similar to the situation in other nature reserves, many problems persist, including, the ongoing deterioration of the ecosystem, a detachment from economic development and

an under-developed understanding of management. In order to fully resolve these problems it is necessary to carry out an analysis of the concrete situation in China's nature reserves and an examination of the relevant countermeasures.

Therefore, the national committee for China's Biosphere Reserve Network (CBRN) has initiated this case study research. This research of Xilingol Biosphere Reserve is the first of its kind and its achievements are to be published shortly. These results include significant reference to the necessary countermeasures and suggestions for resolving the existing degradation of Inner Mongolia's ecosystem, for instance by: utilizing the biosphere reserve concept to control ecological degradation; appropriately dealing with the relationship between the urban and rural sectors within the nature reserve; promoting substitute industries which advance economic development, while also benefiting the system of conservation management in areas such as ecotourism. There is no shortage of ideas for improving the current situation. Therefore, it is with pleasure that I introduce this book, especially in the hope of increasing the awareness of the issues and of arousing the attention of the relevant interests.

Xu Zhihong

President of the Chinese National Committee
for Man and the Biosphere Programme
Academician of Chinese Academy of Sciences

President of Peking University

10 March 2002

序 二

锡林郭勒草原自然保护区是在华夏大地上列入世界生物圈保护区网络的第一个草地类型的自然保护区。它的兴建实现了草原儿女历史性的夙愿,引起了人们广泛的关注。

中国人与生物圈国家委员会对锡林郭勒生物圈保护区的健康成长给予了多方面的支持。继1994年按照联合国国际生物圈保护区管理标准进行过全面评估之后,于2001年又组织多位知名生态专家开展了《锡林郭勒生物圈保护区可持续管理案例研究》。这份研究报告,针对该保护区在发展过程中出现的诸多社会、生态和经济问题进行了分析,重点对锡林河流域草原植被退化成因,保护区境内的城镇化和石油、煤炭资源开发对草原环境的影响,以及方兴未艾的生态旅游等问题进行了全面的分析讨论,提出了许多有益的见解。特别令人高兴的是,专家们对多年困扰保护区发展的管理制度问题,在进行认真总结与反思的基础上,提出了一个全新的管理体系框架,明确指出:

(1) 必须树立锡林郭勒生物圈保护区的建设和管理为全流域生态可持续发展服务的观点。

(2) 保护区管理委员会就是权威性的、公共利益的代表者和行使政府职能的协调监督机构,而不是一般被动的护理单位。

(3) 保护区管理委员会要制定有科学依据和法律作用的保护区总体规划,作为中长期建设的依据。

(4) 重新调整保护区功能区划空间结构势在必行。扩大核心区面积,可增强海流特典型草原生物多样性保护效应和生态系统服务功能,从而实现大面积有效管护草原与环境的总体目标,同时,还可以进一步提高锡林郭勒生物圈保护区的国际保护区的地位。

我对这些观点非常赞赏,并希望能引起政府和有关部门领导的重视,能够早日付诸实施,为我国草原自然保护事业做出有益的贡献。

雍世鹏

内蒙古大学生命科学学院教授

2002年1月22日

FOREWORD II

Xilingol Grasslands Nature Reserve was the first grasslands nature reserve in China to join the World Biosphere Reserve Network. The development of the grasslands has been a long cherished wish of the people, which has aroused the widespread attention and interest of the people. The Chinese National Committee for the Man and the Biosphere Programme (MAB) have provided a great deal of support for the long-term health of Xilingol Biosphere Reserve.

After China MAB carried out a complete appraisal of the China biosphere reserve network in 1994 according to UNESCO's World Biosphere Reserve management standards, then in 2001 they have once again carried out the following research, "A case study on the sustainable management of Xilingol Biosphere Reserve" by a number of ecological experts.

This research report is aimed at carrying forward the research and analysis of the social, ecological and economic problems that have arisen during the development of the nature reserve. This research mainly focuses on the causes of degradation to the vegetation and grasslands within the Xilin River catchment. The research has been carried out through discussions with the various stakeholders and by analysing the many aspects of the problems, including the relationship between the urban and rural industries within the nature reserve, the utilization of its natural resources, like petroleum and coal and the impact of this extraction upon the grasslands environment, as well as the gradual expansion of ecotourism. This research project has also raised many instructive suggestions and solutions aimed at resolving the apparent contradictions. Especially encouraging is that after conducting a thorough summing up and reappraisal of the basic issues, these specialists have suggested a completely new framework for the system of management, with the following suggestions:

- (1) The comprehensive management aims of the nature reserve need to consider servicing the ecological sustainable development in whole region.
- (2) The nature reserve management committee should be authorized to represent the common interests and perform the administrative function of promoting cooperation

and monitoring, rather than continuing to act as a passive administrator.

(3) The nature reserve management committee must be established according to a scientific and legal basis so as to ensure the coordinated programming of the nature reserve, according to a medium and long-term time-frame.

(4) It is necessary to restructure the biosphere reserves functional areas and expand the coverage of the core area so as to increase the effective biodiversity conservation and the ecological service function of the Hailiute typical grasslands. As a result of increasing the size of the core area, the common aim of improving the management of the grasslands and the regional environment will be closer. Furthermore, this will further raise the international significance of Xilingol Biosphere Reserve.

I fully support these proposals and I hope they will arouse the attention of the relevant government and departmental leaders. So that it will be possible to reverse the current problems and implement these suggestions in order to immediately realize the common benefits of managing China's grasslands nature reserves.

Professor Yong Shipeng

The Faculty of Life Sciences

Inner Mongolia University

22 January 2002

序 三

锡林郭勒生物圈保护区可持续管理案例研究项目是由中国人与生物圈国家委员会于2001年启动,它是加拿大国际开发署(CIDA)和联合国教科文组织(UNESCO)东亚生物圈保护区于1998年—2000年所支持的“中国自然保护区可持续管理政策评估”这一项目的延续。通过这项案例研究,研究人员认识到需要对引起目前环境退化问题的主要原因之间的内部联系进行深入分析,以便给中国有关部门决策提供第一手的详细资料。锡林郭勒生物圈保护区是即将进行的许多案例研究中的第一个。UNESCO北京办事处、雅加达办事处和巴黎总部都非常愿意对该研究提供帮助。

锡林郭勒生物圈保护区是中国典型草原生态系统的代表。过去在中国所建立的自然保护区中没有典型草原这一生态系统类型。本保护区是在20世纪80年代中期为进行科学研究和生物多样性保护而成立的,并于1987年被联合国教科文组织接受为生物圈保护区。锡林郭勒生物圈保护区不仅进行了长期的科学研究监测活动,而且围绕生物圈保护区的3个主要功能进行了许多科教活动和国际交流与合作。然而,正如许多科学家及当地政府所认识到的那样,锡林郭勒生物圈保护区的整体环境条件仍在逐渐恶化,植被退化,土地利用状况和地被物在发生变化。草地沙漠化面积扩大,而湿地面积缩小。如此严重的环境问题使该地区的可持续发展受到极大的威胁。因此我们要努力寻找能有效阻止该保护区自然环境进一步恶化的办法,并及时把它应用到实际工作中。通过详细的调查和准确的分析,本案例研究在达到这一目标方面已经迈出了重要的第一步。

从某种程度上说,锡林郭勒生物圈保护区的状况可以看作是当前内蒙古自治区大部分地区生态问题的缩影。中国人与生物圈委员会所做的努力不仅仅是为了锡林郭勒盟未来的发展,而是为整个自治区的发展和配合国家在防治荒漠化方面的工作。我们很高兴看到这个研究组在如此短的时间内取得了很多的研究成果,有些研究结果没有被总结到本书中。我希望研究组所得到信息,得出的结论和提出的建议,在保护区的管理阶层和当地社区中能够得到有效的和广泛的传播。我也希望在中国人与生物圈委员会的指导下,更多的案例研究将会继续进行下去。当然,为了提高生物圈保护区管理质量,UNESCO将随时为中国人与生物圈委员会提供必要的帮助。

对于那些对人与生物圈感兴趣的人来说,锡林郭勒生物圈保护区的案例研究是非常有意义的。本书中有关锡林郭勒生物圈保护区管理机制的探讨,生态旅游与地区经济发

展和保护之间关系的论述,以及城镇发展在生物圈保护区中的作用等问题都和人与生物圈委员会即将在国际和地区之间要上马的一些新项目有很大的联系。UNESCO 雅加达办事处非常感谢中国人与生物圈委员会为这些主题所做的努力,也希望在以后的项目执行过程中有更多的合作与交流。

韩群力

科技及环境项目官员

联合国教科文组织雅加达办事处

2002年2月23日

FOREWORD III

The case study on sustainable management of Xilingol Biosphere Reserve was initiated in 2001 by MAB China, in conjunction with the successful completion of an assessment on sustainable management work of the East Asian Biosphere Reserves during 1998-2000. The output of the policy study convinced its researchers about management policy for China's nature reserves project supported by CIDA and UNESCO within framework needs to go much further to analyse the interlinked underlying causes of the problems addressed by MAB-China, and to provide the country with a number of tangible, detailed and comprehensive cases for reference. Xilingol Biosphere Reserves was among the first sites for such case studies. UNESCO's Offices in Beijing, Jakarta and Paris were pleased to be able to provide their support to the study.

Xilingol Biosphere Reserve represents China's typical steppe ecosystem that used to be less covered in the conservation systems of the country. The area was set as a conservation and scientific reserve in mid of 1980's and was accepted as a biosphere reserve in 1987. In addition to its long-term scientific programme for research and monitoring, the Biosphere Reserve over the years has carried out many activities along the three functions of biosphere reserves, including international exchange and cooperation. However, as noted by scientists and local governments, the overall environmental situation in Xilingol has been deteriorating, with obvious degradation of vegetation, change of land cover and land use, enlargement of sandy land and shrink of wetlands, putting the sustainability of the site under a serious question. Effective counter measures must be found and applied as soon as possible. The case study has achieved a first step toward reaching such an objective through its detailed and convincing investigation and analysis.

In some ways, the situation in Xilingol Biosphere Reserve can be regarded as indicative for current ecological conditions of a large part of Inner Mongolia. The quest of MAB is thus not only significant for the future of Xilingol, but for the development of whole autonomous region as well as for the country's effort in combating desertification. We are very pleased to see the progress made by the project team in this short period of time, the rich results of which are not summarized in this special MAB

publication. I hope the information obtained, the conclusions and recommendations made by the team can be effectively communicated to the management authorities and local communities. We also hope that the case study be furthered with guidance from MAB China. As always, UNESCO will be ready to provide its assistance to MAB-China in order to improve the practice of biosphere reserves.

For those who are interested in current MAB agenda, the Xilingol study has a particular relevance. The papers on the management mechanisms in Xilingol, ecological tourism in relation to conservation and economic development of the area, and the roles of urban development in a biosphere reserve are strongly linked to the new subjects being addressed by MAB through international and regional taskforces. UNESCO Jakarta Office thanks MAB-China for making its effort in contributing to these MAB themes and expects more cooperation in pursuing the subjects.

Han Qunli

Programme Specialist for Science,
Technology and Environment

UNESCO Office Jakarta

23 February 2002