



森林 Living Forests 脉搏

华南生物多样性保育杂志

A magazine for biodiversity conservation in South China

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本單張以再造纸及大豆油墨印制



世纪重任：提升复原力
应对石油顶峰和气候变化
The challenge of the century:
building resilience to peak oil
and climate change





森林脉搏

《森林脉搏》为中英双语刊物，内容环绕华南地区的生物多样性保育。透过不同的新闻与专题文章，推动自然保育人士作经验分享和讯息、意见的交流，尤其是区内关注森林者。

《森林脉搏》内刊登之所有文章，其内容纯属个人意见，不一定反映编委或本园立场。

About Living Forests

Living Forests is a magazine in English and Chinese about biodiversity conservation in South China. With news and articles, it encourages the exchange of ideas, experiences, impressions and information among nature conservationists, particularly those concerned with the region's remarkable forest heritage.

Articles in *Living Forests* represent the personal views of the authors and are not necessarily shared by the editors or by KFBG.

封面图片说明：

01 益智 *Alpinia oxyphylla*
(Cardamom)

02 霍氏巨腿螳 *Hestiasula*
hoffmanni

关于本园

嘉道理农场暨植物园(本园)位于本港最高山脉大帽山(957米)北坡下。园内清溪汇流，翠林环抱，还有不少果园和梯田，以及各种保育及教育设施。

今天的嘉道理农场暨植物园是一间独特的公私营合作机构。在1995年1月20日，立法局通过嘉道理农场暨植物园公司条例(第1156章)，本园正式成为保育及教育中心。本园虽为公共机构，但经费是来自私营的嘉道理基金。

自1995年起，本园致力于推广香港和华南地区的保育及永续生活，并推行各类计划促进动植物保育和有机农业。

本园的使命是「致力提高大众对人与环境关系的认识，透过保育和教育，积极改善世界」。

中国项目

1998年，本园开展“华南生物多样性保育计划”，悉力保育广东、广西及海南三省幸存的天然林。我们的工作包括在华南60多个森林地区进行快速生物多样性调查，从而更透彻了解众多物种栖息的地方、这些物种如何在现今环境下存活以及它们面对的威胁。只有充分掌握这一切资料，我们才可以更妥善地保护他们赖以生存的土地。

2003年，“华南生物多样性保育计划”正式改名为“中国项目”，工作重点也从资料搜集转化为实际行动。我们从多角度审视问题，采取有效的行动保护自然森林和濒危物种，此外并教育农民有机种植的原理和方法，以及鼓励人们善用大自然慷慨赐予的宝贵资源：永续概念的精髓。

About KFBG

Kadoorie Farm and Botanic Garden (KFBG) is situated on the northern slopes of Hong Kong's highest mountain – Tai Mo Shan (957 metres). Within KFBG are streams, woodlands, orchards and vegetable terraces – together with conservation and education facilities.

KFBG, today, is a unique public-private partnership, incorporated and designated as a conservation and education centre by Ordinance (Chapter 1156) in the Legislative Council of Hong Kong on 20th January, 1995. While KFBG is a public organisation, it is privately funded by the Kadoorie Foundation.

Since 1995, KFBG has focused on promoting conservation and sustainable living in Hong Kong and South China, with programmes on flora and fauna conservation and the promotion of organic agricultural practices.

KFBG's mission statement is “We exist to increase the awareness of our relationship with the environment and bring about positive change in the world through conservation and education”.

About the China Programme

In 1998, KFBG started the South China Biodiversity Conservation Programme, focusing on the remaining natural forests of Guangdong, Guangxi and Hainan. Our work included rapid biodiversity surveys of more than 60 forest areas in the region. These have given us a greater understanding of where many species live, how they are surviving in today's world, and what threatens their existence. Only with such understanding can humans take better care of the landscape on which their future depends.

By 2003, the renamed China Programme had shifted its focus from information-gathering to action. Our aim is to minimise the loss of biodiversity and encourage sustainability in China. Taking a holistic view of problems, we act to protect natural forests and endangered species. We also educate farmers about ecological principles and methods, and encourage people to use wisely the bounty of nature: the essence of sustainability.

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Living Forests is now online (www.kfbglivingforests.org)! To save paper, hard copies will not be sent to readers who enjoy easy Internet access, except by special request. Please kindly send your feedback by post or email (contact details on p. 69). Thank you and happy reading!

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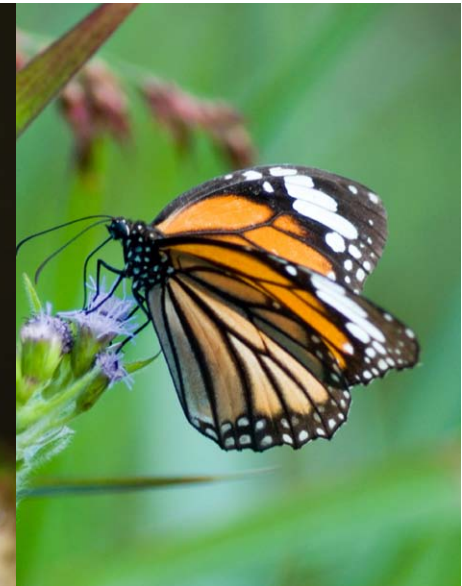
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Sterculia hainanensis (Hainan Sterculia)



亮灰蝶
Lampides boeticus (Long-tailed Blue)



大绿臭蛙
Odorrana Graminea (Green Cascade Frog)



虎斑蝶
Danaus genutia (Common Tiger)

本期内容

“2010国际生物多样性年”的伊始，就被毫无突破的哥本哈根世界气候大会笼上了一层阴云。保护生物多样性和摆脱目前的不可持续的生活方式，看来还任重道远。但越来越多的人已开始把资源紧缩和能源限制、经济危机和环境状况、包括气候变化在内的诸多问题联系在一起。事实上，只有把这些问题作为一个整体来考虑，我们才有可能拥有一个复原力强大、充满希望的未来。

本期的《森林脉搏》从不同的角度探讨了“复原力”的概念。史蒂夫·巴斯 (Steve Bass) 著文论述了经济复原力，讨论了未来的紧急援助应以什么为目标，告诫我们要加快在人与自然两方面的投资。费乐思的文章细数了即将到来的能源危机和气候变化对世界的影响，还介绍了在全球开始扎根的“转化运动”，并提出它们对保护所带来的潜在影响。

比尔·亚当斯 (Bill Adams) 的著作节选提醒环保人士：我们对今天的“困境”都负有责任，因此参与“转化”也应责无旁贷。乐小山和费乐思的合著，把我们带到海南农村：探讨社区项目的实践如何增强农民的复原力，使他们更能应对全球经济和环境危机。内地自由学者曾世逸的思考则更为宏观，他想弄清的是“石油顶峰”和“气候变化”在中国究竟意味着什么，迈向永续的“转化行动”究竟该是什么样子。文章结尾得出“停止相互指责的游戏”的结论，也许值得让各国的领导人们来听一听。当然城乡互助的关系不可忽视，正如社区伙伴的项目官员周晖和邓文婧在介绍他们的“社区支援农业”项目时强调的那样。

本期的“珍稀物种小档案”主角是华南动植物宝库中的两员：野生香港细辛和鹦哥岭树蛙——它们的命运均受到气候变化的影响。一如往常，本期《森林脉搏》也报导了本园在中国的保护工作，以及近期出版物。往届嘉道理农场暨植物园奖学金得主周友兵，与大家分享了他的团队在果子狸及其他几种会传播种子的食肉动物研究上取得的令人瞩目的成果。

本期的“华南保育先驱”主角则是前世界自然基金会（香港分会）主管梅伟义 (David Melville)，他对保育工作的永不放弃和奉献精神激励了一批香港保育工作者。时至今日，我们的这位保育先锋尚未卸甲归田，虽已迁居新西兰，却依然为保存东亚涉禽的越冬地而奔走呼吁。他的故事提醒着我们：保护工作没有国界，正如气候一样。

In this issue...

The start of 2010, the UN Year of Biodiversity, was somewhat overshadowed by the muted progress at the big climate change meeting in Copenhagen – we have a long way to go to protect biodiversity, and younger generations, against our unsustainable lifestyles. Still, a growing number of people are drawing links between tightening resource and energy limits (especially oil), recent economic crises and the state of the environment, including climate. All must be addressed together if we're to shape a resilient future.

In this issue we explore this concept of resilience, from different angles. Steve Bass looks at economic resilience, and where future bailouts should be aimed, urging investment in both nature and people. John Fellowes spells out impacts of the forthcoming energy crunch and climate change, introduces transition initiatives, and asks the implications for conservation. An excerpt from Bill Adams reminds conservationists that we too are part of the problem, and cannot shirk our role in transition. Hil Padilla and John Fellowes explore practical interventions for people in rural Hainan, and how these could work to build their resilience against economic and environmental shocks. Zeng Shiyi then asks more broadly what peak oil and climate change mean in China, and what a Transition to sustainability might look like (his conclusions about avoiding the blame game might well be heeded by world leaders!). It must surely include mutually supportive rural-urban relations, as Frances Fai Chau and Sherman Tang highlight in the community-supported agriculture work of Partnerships in Community Development (PCD).

In the spotlight are two of the many South China species – a wild Asarum ginger and a treefrog – whose future will be threatened by climate change. Elsewhere we report on what KFBG is up to in conservation in China, and list recent publications on the region. Zhou Youbing gives the fruits of his team's impressive findings on palm civets, and other seed-dispersing carnivores. And our conservation pioneer is David Melville, former director of WWF Hong Kong, whose restless dedication spurred on a number of Hong Kong's current conservationists. His current work in New Zealand, defending overwintering sites for some of East Asia's shorebirds, is a reminder that conservation, like the climate, knows no national bounds.

《森林脉搏》推出电子版

《森林脉搏》于2009年7月正式推出电子版(<http://www.kfbglivingforests.org/>)，已给从事华南生物多样性保育工作的1300多个相关单位及个人发出通知。

斑鳖最新受孕动态

为使最后两只饲养的斑鳖尽早繁殖，各界仍在积极想方设法、采取措施。2009年9月，本园兽医亚历克斯(Alex Grioni) 受邀前往苏州动物园，在母斑冬眠前，给它做了一次健康检查。2009年，母斑鳖共产超过200个卵，但它们不是没有受精就是在孵化早期就死了。食物可能是一个问题，动物园的工作人员也在尝试做些改进。另外，他们在母龟栖息的水池边加装了一个玻璃屏障，避免母龟误食游客扔进的垃圾食品和塑胶袋。这个由国际龟类生存联盟(TSA)和国际野生生物保护学会(WCS)支援的合作项目在2010年将继续进行。

海南长臂猿最新消息：

A 群依然存活，情况良好！

2009年10月，霸王岭国家级保护区的护林员终于在斧头岭的东南部搜寻到了海南长臂猿中A群的踪迹。在迄今幸存的两群长臂猿中，A群一直相对离群索居。近年来，不太怕人的B群长臂猿活动范围比较固定，监测小组时不时都可以看到他们的踪迹。但去年，监测小组一整年也没有看到A群——该群最后一次被看到时，拥有九只长臂猿，引起各种猜测和担忧。有的认为A群分群了，有的担心A群可能已惨遭捕杀。中国项目资助的长臂猿监测小组对从前长臂猿不常出沒的斧头岭东面陡峭山坡地形不熟悉。长达一年的时间与A群——最大的长臂猿群失去联系，对队员们的士气是不小的打击。从2009年的3月份开始，嘉道理中国项目的工作人员将和监测小组开会的频率增加到每月一次，并取得霸王岭保护区同意，重新调配精壮人员，前往长臂猿最有可能出沒的区域展开巡逻。付出终有回报，10月份，队员们发现了长臂猿A群的所有成员并拍下了照片。更让大家惊喜的是，A群中增加了两头幼猿，总数达到了11只。应霸王岭国家级保护区和海南省林业局野生动植物保护管理局的要求，中国项目在2010年元月带队展开了第二次全面的种群数量普查——这也是自2003年来第一次对这极度濒危猿种开展调查。这次调查确定了两个家庭群的位置。与此同时，我们和保护区为1000株榕树扦插育苗，计划在2010年春季将这些苗种在保护区的森林恢复地里。保护区人员的技巧也在提升。

金钱龟是否能在香港野外存活？

香港是拥有最健康野生金钱龟（即：三线闭壳龟）种群的地方，但这种极度濒危的物种是否可以继续在香

港野外存活，仍然令人怀疑。继我们的报告指出非法偷捕金钱龟在香港仍颇为严重，2009年7月，香港政府渔农自然护理署同意制定一项保护金钱龟的行动计划，以作为对这份报告的回应。自2001年以来，本园已成功繁育了63只金钱龟，但其在野外生存的前景依然令人担忧。生物分类的意见不一，更把情况进一步复杂化——遗传研究指出确认几个分支，但他们的分类地位却未能确定 (Spinks PQ et al., 2009. *Zootaxa* 2018: 58-68)。可以肯定的是，所有分类种群仍受到非法捕捉和贸易压力的影响。

海南鱼寻得更多避难所

海南鹦哥岭保护区周边的社区正逐渐接受鱼类保护和可持续利用的概念。2009年6月，本园和保护区联合组织的“拯救墨头鱼”活动，成功将300尾受建坝影响的海南特有海南墨头鱼放入安全河段。学生和当地居民受邀参加了当日的拯救活动。在同月，保护区内新成立了两个鱼类保护区。不少社区已向保护区求助，说建立自己的鱼类保护区。中国项目工作人员正在协助保护区编写《禁渔区指南》，为未来鱼类保护区监测和管理提供指导。另一方面，一些非法炸鱼的行为仍在继续。



“拯救海南墨头鱼行动”
A participatory rescue operation for the endemic and threatened fish, Hainan Garra Garra hainanensis.

Living Forests online

The web version of *Living Forests* (<http://www.kfbglivingforests.org/>) was launched in late July 2009. Electronic notification is now sent to 1,300 contacts involved, in different ways, with forest biodiversity conservation in South China.

Giant Softshell Turtle latest breeding efforts

Urgent attempts to breed the only two known captive individuals of the Yangtze Giant Softshell, *Rafetus swinhoei*, continue. KFBG vet Alex Grioni visited Suzhou Zoo in September 2009 for an attempt to capture the female, for a health assessment before hibernation. Over 200 eggs were laid during 2009, but all proved unfertile or died early during development. Diet is likely to be a problem, and long-standing practices are gradually being changed. A glass barrier has been constructed to protect the female from junk food and plastic thrown in by visitors. This joint effort by turtle conservation community (including Turtle Survival Alliance and WCS-China) will go on in 2010.

Hainan Gibbon: Group A is alive, well, and huge

In October 2009 Bawangling National Nature Reserve (NNR) wardens finally succeeded in seeing the elusive Group A, one of the two known Hainan Gibbon groups, in the southeast part of their Futouling range. The habituated Group B of the world's rarest ape species has not strayed far from its range of recent years and was often seen by monitoring team. But for the past year Group A, which numbered nine individuals, had not been seen at all, fuelling speculation it had split and concern that it might be susceptible to hunting. Being unfamiliar with the rugged terrain on the east slopes of Futouling the reserve's monitoring team, funded by KFBG, had become demoralised after almost a year-and-a-half without contacting the largest group. From March KFBG staff held monthly meetings with the monitoring teams and agreed with the NNR to redirect patrolling efforts to ensure dedicated staff reached the likely areas. The reward came in October when the whole Group A was seen and photographed. What's more, two new births this year have swelled the group to 11 individuals. At the request of Bawangling NNR and Hainan Wildlife Conservation Bureau, in January 2010 KFBG led a second comprehensive population census – the first of the Critically Endangered ape since 2003. This confirmed the locations of the two groups. Meanwhile over 1,000 fig-tree cuttings are being nursed and these will be planted in Summer 2010; reserve staff are gradually learning the best techniques.

Does the Golden Coin Turtle survive in Hong Kong?

The wild status of the Critically Endangered Golden Coin Turtle, *Cuora trifasciata*, continues to be in doubt in its Hong Kong stronghold. Following a report highlighting the continued illegal trapping of the species, in July 2009 the Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government agreed to develop a conservation action plan for the species in the SAR. KFBG has successfully bred 63 Golden Coin Turtles in captivity since

2001, but their status in the wild remains of great concern. The situation is further complicated by taxonomic controversy – genetic research points to several clades of uncertain status (Spinks PQ et al., 2009. *Zootaxa* 2018: 58-68). None of the taxa or populations can be considered free from the pressures of illegal trapping and trade.

Hainan's fish find more safe-havens

Communities around Hainan's Yinggeling Nature Reserve are gradually warming to the concept of conservation and sustainable use of fish. A fish rescue activity in June 2009 released over 300 juvenile *Garra hainanensis*, a threatened cyprinid fish endemic to Hainan, and raised conservation awareness by involving students and local residents in the rescue. In June two new fish sanctuaries were set up, and more communities are asking the reserve for help in establishing their own. KFBG and Yinggeling staff are now documenting the procedure so as to provide better guidance for future fish sanctuaries. On the other hand some illegal dynamiting continues.

Sustainable practices extend to new communities around Yinggeling

Experience of sustainable agriculture gained from Daoyin village is being applied to other areas of Yinggeling Nature Reserve. Hongxin Village, in the Yuanmen district near Baisha Town, agreed to become a pilot community to showcase sustainable practices for the area, following an invitation from Baisha officials. Yuanmen, to the northeast of the reserve, is more accessible than Daoyin in the northwest where the Yinggeling/KFBG sustainable-agriculture team has been working. Another high priority now is to work with communities in the south of the reserve, whose activities sometimes come into conflict with forest conservation. In June 2009 a five-day Community and Education Facilitators' Orientation workshop marked the opening of the new Yinggezui Sub-station of Yinggeling Nature Reserve. Twenty-two local wardens and 17 representatives from other nature reserves in Hainan and Guangxi took advantage of the interactive learning methods, which were shared with all 200 Yinggeling wardens in the following months. Yinggeling staff have also begun running environmental education outreach activities in local schools, with KFBG guidance.



社区教育协调员培训班全体人员在鹦哥讲堂前合影。
Participants at the Community and Education Facilitators' Orientation workshop, Yinggezui Substation.

生态农业在鹦哥岭周边更多社区推广

中国项目和鹦哥岭保护区在道银村积累的可持续农业的经验，正被用在保护区周边的多个社区。我们接受白沙县政府的邀请，选定在白沙县中心城区不远的元门乡红新村做生态农业示范。元门乡位于保护区东北部，交通比位于西北的道银村要便利的多。另一项优先工作是与保护区以南的社区合作。当地居民的一些活动仍不时与森林保护发生冲突。2009年6月鹦哥岭自然保护区鹦哥嘴分站正式启用，并举行了首个为期5天的社区教育协调员培训班。鹦哥岭保护区的22名护林员和来自海南、广西等自然保护区的17名工作人员参加了培训。培训方式灵活，注重互动，深受学员好评。在随后的几个月里，受训的学员将培训班的经验和主要的社区工作原则与保护区的其它180名护林员做了分享。在本国中国项目的引导下，鹦哥岭的工作人员已开始在周边的一些学校组织环境教育活动，提高师生对环境、保护的认识。

嘉道理农场暨植物园奖学金计划最新动态

今年，嘉道理农场暨植物园奖学金计划又新增五位奖学金得主（获奖名单见下表）。今年该计划共收到15份申请。9月25-28日，嘉道理农场暨植物园联合海南师范大学和海南省林业局海南野生动植物保护管理局，在海南师范大学召开了本年度的奖学金报告会。报告会特邀海南师范大学的史海涛教授、五指山国家级自然保护区管理局副局长张剑峰，以及中国项目的乐小山和卢刚做主题报告。同期，在校区内还展出了《华南野色图片展》，中国项目工作人员还与海南各所大学绿色团体的学生交流和分享了野外工作经验和体会。会后，奖学金报告会与会人员受邀前往鹦哥岭自然保护区参观交流。

俄贤岭石灰岩森林

自2009年8月起，海南省林业局野生动植物保护管理局李仕宁成为本园的兼职顾问，协助俄贤岭石灰岩森林的管理工作。李仕宁目前所面临的挑战是如何发动护林员和提高他们的工作能力。

广西西大明山冠斑犀鸟保护项目正式启动

为救护华南地区最后的一个犀鸟种群，本园于近期启动了广西西大明山自然保护区斑冠犀鸟保护项目。冠斑犀鸟（*Anthracoceros albirostris*）全球状况被评为无危，却是在华南地区濒临灭绝的一个物种。它是一些受威胁、长有大型种子果实树种的主要传播者。由于同区域内其他特大种子传播者已消失，更使得冠斑犀



迈克老师和广西中东小学的学生玩自创的犀鸟棋。 Mike Cline playing a board game with students at Zhongdong primary school, Guangxi.

鸟具有不可替代的生态作用。在本国中国项目的组织下，河池学院的蒋爱武博士将对这种犀鸟的生态学进行研究，联合国国际学院的吴世捷博士也将协助研究区域内的植被和确认犀鸟的食用树种。来自美国、在中国教授地理的热心老师迈克和南宁动物园的阚腾程也联手在当地的学校开展环境教育活动，提高师生的保护意识。2009年12月，本园和西大明山保护区共同组织了第一次犀鸟调查，来自西大明山保护区的工作人员，项目合作伙伴，志愿者和来自鹦哥岭护林员等超过30人参加了调查。我们在保护区600平方公里的一些森林内观测到至少43只犀鸟，估计总数可达到60只。但令人担忧的是，当地捕猎仍然活跃，一个猎人甚至承认在统计调查前几天还猎到一只犀鸟。目前，西大明山保护区领导对犀鸟保护大力支援，因此，我们有信心改变当地群众对犀鸟保护的态度。

2009年度嘉道理农场暨植物园奖学金获奖名单 List of 2009 KFBG Studentships Awardees

姓名 Name	学位 Degree	院校 Institution	研究题目 Topic
黄柳菁 Huang Liujing	博士 Ph.D.	中国科学院华南植物园 South China Botanical Garden, CAS	《城市化压力下常绿阔叶林生物多样性的回应》 The response of biodiversity in evergreen broadleaf forest to urbanization pressures
任海庆 Ren Haiqing	硕士 M.Phil.	湖北大学 Hubei University	《海南橡胶林与天然林蜘蛛群落多样性的比较》 Spider diversity in rubber and natural forest in Hainan
王继山 Wang Jishan	硕士 M.Phil.	中国科学院昆明动物研究所 Kunming Institute of Zoology, CAS	《云南闭壳龟野外生态调查研究》 Ecology of Yunnan box turtle <i>Cuora yunnanensis</i>
钟杰 Zhong Jie	硕士 M.Phil.	中国科学院植物研究所和东北师范大学 Institute of Botany, CAS, & Northeast Normal University	《广西西南地区冠斑犀鸟在森林种子传播及森林更新中的作用》 The role of Oriental Pied Hornbill (<i>Anthracoceros albirostris</i>) in seed dispersal and forest recruitment in the southwest of Guangxi
甘蔚萍 Gan Weiping	硕士 M.Phil.	华南农业大学 South China Agricultural University	《海南霸王岭长臂猿栖息地造林效果的初步研究》 Effects of afforestation in habitat restoration for Hainan Gibbons in Bawangling Nature Reserve, Hainan

KFBG Studentships

Five KFBG studentships were awarded in 2009, from 15 applications: see Table. The annual studentship presentations were held on 25-28 September, organized with our partners Hainan Normal University (HNU) and Hainan Wildlife Conservation Bureau (HWCB) of Hainan Forestry Department. There were lectures by HNU's Prof. Shi Haitao, HWCB's Mr Zhang Jianfeng and CP's Hil Padilla and Lu Gang; we also shared our conservation experience with the university students, some of whom helped as interpreters to our 'Wild Colours of South China' exhibition, and took Studentship holders and applicants to Yinggeling Nature Reserve.

Liu Nana, a 2008 KFBG Studentship Awardee from the College of Life Sciences, Nanjing Normal University, was not able to obtain the necessary permit to carry out her research on *Teinopalpus aureus*, a Class I protected butterfly. Hence, the support to her research had to be discontinued.

Exianling Limestone Forest

From August Mr Li Shining of Hainan Wildlife Conservation Bureau joined KFBG as a part-time consultant, focusing on the management of Exianling limestone forest. The challenge now is to mobilise and train the wardens to carry out their challenging duties.



本园工作人员和俄贤岭的护林员在雄奇的俄贤岭石灰岩森林前合影。 KFBG staff and Exianling wardens in front of the majestic Exianling limestone forest.

Attempt to save Guangxi's Oriental Pied Hornbill in Xidamingshan

KFBG has launched a pilot conservation project in Guangxi's Xidamingshan Nature Reserve in a bid to save the last South China hornbill population. The Oriental Pied Hornbill *Anthracoceros albirostris*, considered of Least Concern globally but on the verge of extirpation in South China, is a key disperser of threatened trees with large-seeded fruits, and is thus of great ecological importance in a region that has lost other such dispersers. Dr Jiang Aiwu of Hechi University will study the birds' ecology, while Dr Ng Saichit of United International College will assist in studying the vegetation and identifying food plants. Mike Cline, a geography teacher in China, and Mr Que Tengcheng from Nanning Zoo, have begun awareness-raising in local schools. A hornbill population survey was held in December, with more than 30 people including reserve staff, project partners, volunteers and wardens from Yinggeling. At least 43 hornbills were observed in several patches of the 600 km² reserve, and we estimate about 60 survive. But hunters were active, one even admitting that a hornbill was shot a few days before the survey. We are optimistic that local attitudes can be changed, with the enthusiastic involvement of the Xidamingshan director.



在迈克老师的帮助下，中东小学的孩子和犀鸟成为了朋友。 With the help from Mike, students at Zhongdong Primary School making friends with hornbills.



2008年度嘉道理生物多样性奖学金得主刘娜娜最终未能成为《金斑喙凤蝶遗传多样性及其濒危机制分析》研究取得许可证，本园唯有终止对其项目的资助。



在白马雪山,当地居民煮食的猪食常常需要用去40%的薪柴。
Baimaxueshan, 40% of collected fuel wood was used to cook pig feed.

为云南动植物栖息地减压

2009年11月,本园中国项目高级农业主任乐小山受瑞尔保护协会邀请,前往云南白马雪山保护区——滇金丝猴(*Rhinopithecus bieti*)的故乡,协助开展工作。白马雪山保护区面临的最大问题是薪柴的过度采集,40%的薪柴原来是用来煮猪食。小山的任务是教授当地的村民制作不需要煮食的猪食,并指导就新方法和传统方法的效果做对比试验,以及如何在高海拔地区种植高蛋白,少纤维的饲草。培训期间,小山还参观了瑞尔开展工作的大山包保护区,那里是黑颈鹤(*Grus nigricollis*)的越冬地,小山亦对恢复过渡放牧的草场提出自己的建议。

广西西部药材贸易能行多远?

在本园的资助下,广西植物研究所的研究项目《广西靖西县端午节中草药市场的民族植物学调查》顺利完成。刘演教授带队的研究小组在端午市场上共发现了近360种中药材,包括一些珍稀濒危品种。调查还发现,一些药材的采集方式对药材生长具相当破坏性。项目组已列出了一份珍稀濒危药用植物名录,建议将这些植物增补到省级保护名录中去。



佳西保护区的云雾林中:苔藓满地满枝,从松针落叶里释放出的丹宁酸把溪流的水都染成了红色。

Cloud forest in Jiayi Nature Reserve. Rocks and tree trunks are carpeted with moss, while the streams are dyed burgundy by tannins released from the decomposing pine needles.

佳西自然保护区生物多样性快速调查

2009年9月本园中国项目组织了海南佳西自然保护区生物多样性快速调查。来自8个海南保护区的工作人员、内地和本园专家共计30多人参加了此次调查。这是继1999年中国项目对该区域的第一次调查后,对佳西保护区展开的最彻底的一次生物多样性快速调查(http://www.kfbg.org.hk/content/51/18/1/E25_Jiayi_report_w.pdf)。在调查前,调查队员接受了半日的培训,学习了不同生物群体调查的技巧。调查发现了一些不为地方保护部门所知的景观和物种,如:海南最大面积的云雾林,以巨大的华南五针松为优势种的针叶林,绵延至低海拔地区的大片成熟林,还有多种海南新纪录及一种中国新纪录的兰花。

中国项目高层管理人员人事变动

中国项目刘惠宁博士已辞去担任了七年的主管之职,以实现直接参与更多前线保育工作的愿望。在此,让我们感谢刘惠宁博士自1998年来,尤其是2003年至今对中国项目做出的杰出贡献。现时,刘博士已转入嘉道理农场暨植物园动物保育部,任高级保育主任,今后他仍参与中国项目在中国大陆的部分工作。陈辈乐博士已于2010年4月1日起正式接任中国项目主管一职。陈博士也曾是嘉道理农场暨植物园动物保育部的一员,2001年,正式加入中国项目,2008年起升任保育经理。陈辈乐博士希望能继往开来,在做好现有项目的同时,在华南和其他地区寻找更多保育工作的机遇。

Taking pressure off Yunnan habitats

KFBG's Hil Padilla joined RARE Conservation in November 2009 to assist their work at Baimaxueshan Nature Reserve, Yunnan, home of the Yunnan Snub-nosed Monkey *Rhinopithecus bieti*. The main threat to the reserve is fuel wood collection, 40% of it to cook pig feed. Hil trained local people on how to prepare uncooked pig feed, on experimental design to compare this with cooked feed, and on growing of high-protein, less fibrous forage crops adapted to high elevations. Also for RARE in Yunnan, Hil visited Dashanbao Nature Reserve, the winter habitat of the Black-necked Crane *Grus nigricollis*, and advised on improving the grasslands threatened by overgrazing.

Unsustainable herb trade in west Guangxi

The KFBG-funded project by Guangxi Institute of Botany, to explore the impact on threatened species of the medicinal herb trade associated with the Dragon Boat Festival in Jingxi, west Guangxi, has been completed. The study team, led by Prof. Liu Yan, found some 360 herb species in the market including some rare and threatened species, and that the harvesting of some of the medicinal plants was not sustainable. The project has generated a list of plants that should be added to the provincial protected list.

Jiayi Nature Reserve rapid survey

In September 2009 KFBG coordinated a rapid biodiversity survey of Hainan's Jiayi Nature Reserve, by in-house and China specialists along with over 30 people from eight Hainan reserves. This was the most thorough survey of the reserve, adjoining Yinggeling Nature Reserve, and the first general biodiversity assessment since KFBG's brief survey in 1999 (http://www.kfbg.org.hk/content/51/18/1/E25_Jiayi_report_w.pdf). Prior to the survey, KFBG staff gave a half-day training on survey techniques for different biotic groups. The survey revealed a number of features not formerly known by local conservation authorities: the most extensive cloud forest in Hainan, coniferous forest dominated by huge Guangdong Pines *Pinus kwangtungensis*, substantial mature

forest extending down to low altitude, some orchids new to Hainan and even one new to China.



Change at the top in the China Programme

After seven years at the helm Dr Michael Lau has chosen to step down from the role of Head of the KFBG China Programme (CP), in part to allow more direct involvement in conservation projects. We thank Michael for his tremendous contribution to CP since 1998 and especially since 2003. Michael has now joined KFBG's Fauna Conservation Department as Senior Conservation Officer; he will continue to spend some time working with CP staff on Mainland projects. Dr Bosco Chan has been appointed as the new CP Head, with effect from 1 April 2010. Himself a former member of the KFBG Fauna Conservation Department, Bosco has been with the China Programme since 2001, and Conservation Manager since 2008. He hopes to continue CP's thriving projects and looks forward to new opportunities in South China and further afield.



亚洲森林面积下降 每年失一个海南

联合国粮农组织新近出版了《2009年世界森林状况》报告，评估了全球森林与林业发展的现状，预测亚太低中收入、森林资源丰富的国家和地区的森林面积将呈持续下降趋势。在2000年到2005年间，亚太地区平均每年损失的天然林面积达到三万七千平方公里，相当于每年损失了一个以上的海南岛。据估计，在未来几十年里，天然林面积将会持续减少。造成这种问题的直接原因包括：将森林转为大片农地（特别是用来种植油棕）及小片农地，迁移性耕作强度和范围的加剧。尽管亚太地区造林力度也在加大，但不断上涨的木材需求仍会对其它地区的森林造成压力。

资料来源: <ftp://ftp.fao.org/docrep/fao/011/i0350e/i0350e.pdf>

乡土树种混交林 对抗极端天气佳

一项对广西冰雪灾区森林受害情况的研究表明：与外来树种相比，乡土树种表现出了更强的抗灾害能力；灾害的影响随海拔高度的升高而加重；阴坡和纯林受灾更为严重。以马尾松为例，采脂的松树比未采脂的松树受灾的情况要严重。作者建议：发展地方林业要选择抗寒抗逆性树种，特别是多发展乡土树种混交林。

资料来源: *林业科学研究* 2008年 第21卷 第06期 837-841 蔡子良等。

关于《中国履行<生物多样性公约>第四次国家报告》

中国环境保护部最近递交了《中国履行<生物多样性公约>第四次国家报告》¹，报告总结了生物多样性保护目前面临的一系列主要障碍，应对政策，以及迈向2010年生物多样性目标（有效的减少生物多样性的丧失）的一些进展指标。

然而，所公布的在生物多样性现状方面的客观指标不足。过去20年，净初级生产力据报每年提高了0.5-1%²；报告称由于夏季禁渔（1995年开始在东海、黄海和渤海，1999年开始在南中国海）措施有效，代表海洋食物链健康程度的海洋营养级指数(MTI)在1997—2006年间稳定增长。报告显示的趋势没有按照2005年时建议的表示方法³，当时提出MTI的计算应只涵括那些已超过一定营养级的物种。不过，目前的趋势如能延续，中国有望在2030年左右恢复至70年代前的MTI值。陆生和淡水生态系统目前还没有类似的营养级指数。

报告里还有一些说法缺乏明确的证据支持（比如55.7%的陆生野生动物数量增加了）。森林扩大的数字包括了人工林，而哺乳动物、鸟类和鱼类的红色名录指数值似乎是按照不同的标准（1998年和2004年的评估）进行计算。

报告里也有一些“压力”指标。交通设施造成的栖息地破碎化急剧增加：过去10年里铁路的密度增加了20%以上，公路则不可置信地增加了1000%（十倍以上）。相反，从2001年到2007年，淡水和海洋生态系统的洁净值呈现正增长趋势，“污染”的海洋区域减少了15%。从1998年到2007年，工业废水的化学需氧量(COD)也呈下降趋势（其中主要是造纸业的废水COD值下降；造纸业的废水COD值仍是最高），但家庭废水的COD值却有增加。二氧化硫排放量趋于增加，但2006-2007年间有所下降。农药等农用化学品也在持续增长。

报告认为中国2010目标中最大进展是目标1.1（至少10%的生态区得到有效保护）和1.2（生物多样性重点区域得到保护），这两者都被认为已经基本达标（然而对保护有效性并无具体的评估）。报告认为进展最慢的（“基本上不达标但有一些进展的”）是目标6.1（对主要的潜在外来物种的入侵路径进行控制）及目标7.1（维持与加强生物多样性适应气候变化的复原力。而大多数目标被认为是“部分达到”。

资料来源：

¹<http://www.cbd.int/doc/world/cn/cn-nr-04-en.pdf>

²Gao Zhiqiang & Liu Jiyuan, 2008. *Chinese Science Bulletin* 53: 317-326.

³<http://rstb.royalsocietypublishing.org/content/360/1454/415.abstract>

救救蝙蝠

在过去的30年里，中国蝙蝠数量急剧下降，估计减少了60%左右。在广西（东部的麻垌乡）飞鼠岩中栖息的中国最大蝙蝠群“皱唇犬吻蝠”群，同期数量已从一百万减少到目前的十万只。导致蝙蝠数量急剧下降的原因有洞穴旅游、农药在蝙蝠体内的积聚、旧建筑物的逐步消失使蝙蝠失去栖息地、人类捕食、森林砍伐和采矿。文章作者建议要尽快加强对成人和小孩的教育，加强执法、着力保护栖息地和规范农药使用。

资料来源: Zhang Libiao et al., 2009. *Oryx* 43: 179-182.

宠物贸易危及龟类

近年国际龟类宠物贸易泛滥。根据2006至2008年间秘密监测中国最大的交易市场——广州越和花鸟市场发现：每一次去都能看到5000只以上的龟，估计年交易量在14.5万只以上；交易涉及至少61个物种——其中只有15个是中国本地种；有38个物种是濒危野生动物种国际贸易公约（CITES）名录里的，39个物种属全球受威胁的，大部分是被非法买卖。作者建议加强管理，包括理清不同主管部门间的职责、加强鉴别能力培训、对购买者和检查者出示许可证等。作者也呼吁当地政府、研究机构和NGO要加强联合监测。

资料来源：Gong Shiping et al., 2009. *Oryx* 43: 213-216.

Asia loses one Hainan each year

The latest global review of forests and forestry – the Food and Agriculture Organization's *State of the World's Forests 2009* report – predicts continuing forest declines in Asia-Pacific's low- and middle-income forest-rich countries. Asia-Pacific lost 37,000 km² of natural forest per year – more than the area of Hainan – between 2000 and 2005, and continued decline is expected for the coming decades. Direct causes include conversion to large-scale farmland (especially oil palm), intensification of shifting-cultivation, conversion to small-scale farmland, and expansion of shifting cultivation into new areas. Despite expanding wood plantations in the region, increasing wood demand will place pressure on forests elsewhere.

Source: <ftp://ftp.fao.org/docrep/fao/011/i0350e/i0350e.pdf>

Mixed native forests weather the storm

A study was conducted on the Guangxi forests damaged by ice storms in early 2008. Indigenous tree species showed greater cold tolerance than the exotic species studied. Impacts were most severe at higher altitudes, on shade slopes and in monocultures. Among *Pinus massoniana* pine trees, damage was greater in tapped than untapped trees. Authors recommend planting trees with greater cold- and stress-tolerance, and favouring mixed forests of native species.

Source: Cai Ziliang et al., 2008. *Forest Research* 21: 837-841.

Rises and falls: China's fourth report to CBD

The Ministry of Environmental Protection has submitted China's *Fourth Implementation Report on Implementation of the Convention on Biological Diversity* (CBD).¹ It highlights a selection of problems facing biodiversity, policy responses and some indicators of progress towards the 2010 Target (to significantly reduce the rate of biodiversity loss).

Few objective indicators of the state of biodiversity are included. Net primary productivity is modelled to have increased at 0.5 to 1.0% per year over 20 years.² A steady growth in Marine Trophic Index (MTI) – which reflects the integrity of the marine food chain – was reported from 1997 to 2006, and attributed to the ban on summer fishing – operative in the East China Sea, Yellow Sea and Bohai Sea since 1995, and the South China Sea since 1999. The reported trend does not apparently follow a 2005 recommendation³ to consider only species above a certain specified trophic level. But if the current trend continued, the pre-1970 MTI value could be attained by around 2030. No such trophic indices are available for terrestrial or freshwater ecosystems.

The report contains some claims (e.g. “The populations of 55.7% of terrestrial wild animals increased”) with no clear evidence base. “Forest expansion” figures include plantations, while the Red List Index values shown for mammals, birds and fish were apparently calculated from assessments (1998 and 2004) that used different criteria.

Some ‘pressure’ indicators are reported. Fragmentation due to transport infrastructure has risen dramatically: density of railways rose by over 20% in the past ten years, and roads by a staggering 1,000% (more than tenfold). Conversely, clean-

water indices for marine and freshwater systems showed positive trends from 2001 to 2007, and the “polluted” marine area dropped by over 15%. From 1998 to 2007 chemical oxygen demand (COD) decreased in industrial discharges (notably from the paper industry where COD is still highest), but increased in domestic discharges. Sulphur dioxide emissions show an increasing trend, but dropped from 2006 to 2007. Agrochemical use, in both pesticides and chemicals, continued to increase.

The report considers China's greatest progress under the 2010 targets has been in Targets 1.1 (“At least 10% of ecological regions effectively conserved”) and 1.2 (“Areas of particular importance to biodiversity protected”), both of which it considers “met to a large extent” (although protection effectiveness is not evaluated). It considers the weakest progress (“basically not met although some progress made”) has been in Target 6.1 (“Pathways for major potential alien invasive species controlled”) and 7.1 (“Maintain and enhance resilience of the components of biodiversity to adapt to climate change”). Most targets are considered “partially met”.

Sources:

¹<http://www.cbd.int/doc/world/cn/cn-nr-04-en.pdf>

²Gao Zhiqiang & Liu Jiyuan, 2008. *Chinese Science Bulletin* 53: 317-326.

³<http://rstb.royalsocietypublishing.org/content/360/1454/415.abstract>

Time to reverse the bat declines

China's bat populations have declined steeply in the past 30 years, by an estimated 60%. The largest known bat colony in China, the Wrinkle-lipped Freetailed Bat *Chaerephon plicata* colony in Feishu Cave, Guangxi, declined from about 1 million to about 100,000 bats in the same period. Major causes include cave tourism, bioaccumulation of pesticide chemicals, loss of old buildings suitable for roosting, eating by humans, deforestation, and mining. The authors recommend conservation education for children and adults, enactment and enforcement of laws, comprehensive protection of roost sites, and regulation of pesticides.

Source: Zhang Libiao et al., 2009. *Oryx* 43: 179-182.

Pet trade adds to turtle troubles

In recent years the international trade in turtles as pets has increased dramatically. The largest pet market in China, Yuehe in Guangzhou, was monitored covertly from 2006 to 2008. On average over 5,000 turtles were seen per visit, with an estimated annual trade volume of >145,000. At least 61 species were traded in all – only 15 were native to China. 38 species traded are CITES listed, and 39 are globally threatened – most of the species were traded illegally. The authors recommend stronger enforcement, including clear allocation of responsibilities between departments and training in identification, and a requirement for showing permits to buyers and inspectors. They also call for collaborative monitoring with local government, academic institutions and NGOs.

Source: Gong Shiping et al., 2009. *Oryx* 43: 213-216.



洞穴专家应该一起行动起来

关于中国喀斯特地区洞穴物种的信息有限但仍能显示其独特性和受胁程度，可惜相关的环评却很少给予重视。采石、旅游、旅游设施建造及流水不断威胁着洞穴，现实却是没有一个政府机构或NGO专门负责洞穴生物多样性的保护。对洞穴动物感兴趣的分类学家应该主动联系洞穴探险团体、推广自然保护的NGO和保护机构。负责自然保护的机构在保护洞穴生态方面需要解决保护区系统和程序上存在的问题。

资料来源：Whitten T, 2009. *Journal of Applied Ecology* 46: 520-523.

合作！

在中国，通过应用生态学影响政策和决策过程的机会正在增多¹。为了开拓这些机会，国内外的科学家需要更加周密地开展合作，并需要更多来自资助方的协助^{1,2}。为使整个研究过程从设计到出版都能在合作中推进，我们需要长期的合作研究项目，如鸡形目鸟类的研究。

资料来源：1McGowan PJK et al., 2009. *Journal of Applied Ecology* 46: 524-526. ²Fellowes, JR et al., 2009. *Oryx* 43: 157-158.

是海南独有的鼠吗？

对海南三种老鼠的基因研究表明，海南社鼠 *Niviventer lotipes* (Allen 1926年命名) 与 *N. tenaster* (Thomas, 1916) 是不同的物种，2005年它们曾被归并为同一种。海南的刺毛鼠 *Niviventer fulvescens* 和大足鼠 *Rattus nitidus* 与东南亚的种群有相似的染色体。海南社鼠与刺毛鼠不同的是它的身体与颅骨较大，尾巴更短及体色更暗。

资料来源：¹Li Yuchun et al., 2008. *Zoological Science (Tokyo)* 25: 686-692. ²Wilson DE and Reeder DM, 2005. 《世界哺乳类动物》，霍普金斯大学出版社

中国的外来植物：是生物多样性的威胁还是生境受干扰的现象？

一份报告发现在华中和华南最臭名昭著的入侵物种是来自美洲新大陆、无性繁殖的多年生植物。来自美洲和欧亚大陆的一年生植物在高度改造过的栖息地中也影响严重¹。一项对海南石灰岩地区的研究发现53种外来植物中有77%来自于新大陆热带地区²。其中能渗入到高海拔的天然林的相对不多。

在香港，另一项研究发现有162种已归化的外来植物³。在大帽山进行的一项对比研究中，在路旁发现了29外来种，小溪旁有15种，只有6种是在离道路和溪流较远的半自然植被中——而且都属于曾被流浪黄牛侵扰的无遮阴区域。只有源自东南亚的蒲桃 *Syzygium jambos* 侵入了未受干扰的林区。因此，研究认为大部

分外来植物是机会主义者（杂草），而非真正的“入侵者”。

资料来源：¹Huang Qiao et al., 2009. *生物多样性与保护* 18: 305-316. ²Qin Xinsheng et al., 2008. *Shengtaixue Zazhi* 27: 1861-1868. ³Leung GPC, 2009. *生物多样性与保护* 18: 191-202.

科学家与记者在气候变化意识工作中的角色

在2009年3月举行的一次国际气候变化科学大会上，会议主席提出，鉴于主流媒体更多受商业目的驱动而非本着教育目的，科学家应该负起向公众传播科学知识的重任。¹ 同时，科学与发展网（SciDev.net）发布了一份媒体指南，提醒所有记者应该了解与气候变化相关的科学知识——这是21世纪最为重大的“故事”。² 给媒体的建议有：负责任地报导气候变化的不确定性（不要耸人听闻，要能区分单一天气事件与气候变化，用实际有意义的方式报导我们将面对的风险，并避免引述没足够根据的“怀疑”）；推广相关的故事（多角度，多报导缓解方法，将故事与有意思的人、地方或主题相结合，多用视像图表等辅助报导，引用不同消息来源）；着重本地新闻（引用本地人的观点，对比本地与全球的成因，解释本地的应对措施，关注资金，做好监督，关注国际会议），请记住——总会有办法的。政府间气候变化委员会主席 R.K. 帕乔里也敦促记者们持续关注采取行动背后的科学理据。³ 《自然》杂志则呼吁科学家们更多与媒体接触，帮助媒体找到他们需要的专家，并与新闻教育机构合作，确保课程能传授相关的科学知识。⁴

资料来源：
¹<http://www.scidev.net/en/news/journalists-criticised-over-climate-change-reporti.html>;
²<http://www.scidev.net/en/practical-guides/climate-change-how-to-report-the-story-of-the-cent.html>;
³<http://www.scidev.net/en/opinions/how-the-media-is-creating-a-climate-for-change.html>;
⁴<http://www.scidev.net/en/opinions/science-journalism-how-scientists-can-help.html>

中国浪费的氮

最近一项研究发现中国在食物生产过程中浪费大量的氮。在作物—家畜生产系统里，生产1千克的氮在麦子、大米和玉米种植上分别要用7.5、8.9、和27千克的氮(用在肥料中)。因此，中国在食物生产过程中如能提高氮的管理，将可以大幅减少氧化亚氮这种主要温室气体的排放。

资料来源：Ma Wenqi et al., 2008. *农业系统* 99: 53-63.

中越边境发现新的颊窝毒蛇

俄罗斯和越南的科学家在越南北部的高平省 Trung Khanh 国家公园发现了一种新的蝮蛇 *Protobothrops trungkhanhensis*。这种蛇只有70厘米长，跟别的

Cave specialists should act together

The limited information on China's cave biota suggests very high endemism and threat, yet environmental assessments in karst areas rarely pay attention to it. No government agency or NGO has responsibility for cave biodiversity, which is threatened by quarrying, visitors, tourism infrastructure and water flows. Taxon specialists interested in cave fauna should reach out to the cave exploration community, the conservation NGOs, and conservation agencies. Those responsible for conservation should address gaps in the protected area systems and processes with respect to safeguarding cave ecology.

Source: Whitten T, 2009. *Journal of Applied Ecology* 46: 520-523.

Collaborate!

There are increasing opportunities to influence policy and decision-making in China through applied ecology.¹ To exploit these opportunities, a more structured engagement is needed between Chinese and overseas scientists, with greater donor support to enable this.^{1,2} Long-term collaborative research programmes, such as those on Galliformes, are needed to enable the whole research process from design to publication to be conducted collaboratively.

Sources: ¹McGowan PJK et al., 2009. *Journal of Applied Ecology* 46: 524-526. ²Fellowes, JR et al., 2009. *Oryx* 43: 157-158.

A rat endemic to Hainan?

Genetic study of three Hainan murid rats revealed one species, *Niviventer lotipes* (Allen, 1926), to be distinct from *N. tenaster* (Thomas, 1916),¹ with which it was synonymised in 2005.² Hainan *Niviventer fulvescens* and *Rattus nitidus* had similar karyotypes to their counterparts from Southeast Asia. On Hainan *N. lotipes* differs from *N. fulvescens* in its larger body and skull, shorter tail and darker coloration.

Sources: ¹Li Yuchun et al., 2008. *Zoological Science (Tokyo)* 25: 686-692. ²Wilson DE and Reeder DM, 2005. *Mammal Species of the World*. Johns Hopkins University Press.

China's alien plants: biodiversity threat or disturbance symptom?

A review found the most notorious invasive species in central and southern China were New World perennials showing clonal growth. Annuals from the Americas or Eurasia were also important in highly modified habitats.¹ A study on Hainan's limestone regions found 77% of the 53 alien plant species were Neotropical.² Relatively few species penetrated higher-altitude natural forest.

In Hong Kong, another study found 162 naturalised exotic species.³ Comparative surveys on Tai Mo Shan found 29 exotic species at roadsides, 15 at streamsides and just six in semi-natural vegetation away from roads and streams – all were in unshaded areas disturbed by feral cattle. Only the Southeast Asian *Syzygium jambos* penetrated into undisturbed shaded vegetation, suggesting most alien species are opportunists (weeds) rather than true invasives.

Sources: ¹Huang Qiao et al., 2009. *Biodiversity and Conservation* 18: 305-316. ²Qin Xinsheng et al., 2008. *Shengtaixue Zazhi* 27: 1861-1868. ³Leung GPC, 2009. *Biodiversity and Conservation* 18: 191-202.

Climate change awareness – roles for scientists and journalists

The chair of an International Scientific Congress on Climate Change in March 2009 said that scientists should take responsibility for communicating science to the general public, since mainstream journalists are often driven by commercial rather than educational motives.¹ Meanwhile SciDev.net, the online Science and Development Network, has issued guidelines for journalists, noting all journalists should understand the science of climate change – the biggest story of the century.² Journalists are advised to responsibly communicate uncertainty (avoid sensationalism; distinguish between individual weather events and climate change; convey risk in a meaningful way; avoid unqualified 'sceptics'), to tell the story (use different angles; report on solutions; tie stories to interesting people, places and topics; use reporting aides; use different sources), to emphasise local stories (cite local voices; compare local and global causes; explain adaptation; report on funding; be a watchdog on compliance; report from global conferences), and to take heart – solutions are possible. R.K. Pachauri, chair of the Intergovernmental Panel on Climate Change, urges journalists to maintain focus on the scientific rationale for action.³ The journal *Nature* calls on scientists to engage with the media, help find them the experts they need, and work with journalism schools to ensure programmes give them an understanding of science.⁴

Sources:
¹<http://www.scidev.net/en/news/journalists-criticised-over-climate-change-reporti.html>;
²<http://www.scidev.net/en/practical-guides/climate-change-how-to-report-the-story-of-the-cent.html>;
³<http://www.scidev.net/en/opinions/how-the-media-is-creating-a-climate-for-change.html>;
⁴<http://www.scidev.net/en/opinions/science-journalism-how-scientists-can-help.html>

China's wasted nitrogen

A recent study finds that China wastes much of the nitrogen used in food production. In crop-animal systems, producing 1 kg of nitrogen in wheat, rice or maize requires 7.5 kg, 8.9 kg or 27 kg respectively of nitrogen in fertilizer. Improved nitrogen management in Chinese food production could greatly reduce emissions of nitrous oxide, a major greenhouse gas.

Source: Ma Wenqi et al., 2008. *Agricultural Systems* 99: 53-63.

New pit-viper on the China-Vietnam border

Russian and Vietnamese scientists have discovered a new species of pit-viper, *Protobothrops trungkhanhensis*, in Trung Khanh National Park in the north Vietnamese province of Cao Bang. The snake is only about 70 cm in length, quite small compared to other *Protobothrops* species. Only three other species in the genus – *P. cornutus*, *P. jerdonii* and *P. mucrosquamatus* – are known from Vietnam. The snake has been found only in Trung Khanh, but is likely to occur in adjacent Guangxi.

Source: Orlov NL et al., 2009. *Russian Journal of Herpetology* 16. VietNamNet Bridge (2009) New species of snake unveiled in Cao Bang, retrieved 09/04/09, from: <http://english.vietnamnet.vn/tech/2009/04/840704/> <http://www.birdlifeindochina.org/sites/default/files/Babbler%2029.pdf> p12

*Protobothrops*原矛头蝮蛇比相对较小，同一属的蛇另外只有三种在越南有分布，包括*P. cornutus*, *P. jerdonii*和*P. mucrosquamatus*。目前只有在Trung Khanh发现这种蛇，但邻近的中国广西可能也有分布。

资料来源：Orlov NL et al., 2009. Russian Journal of Herpetology 16. VietNamNet Bridge (2009) New species of snake unveiled in Cao Bang, retrieved 09/04/09, from: <http://english.vietnamnet.vn/tech/2009/04/840704/www.birdlifeindochina.org/sites/default/files/Babbler%2029.pdf> p12

路边的兰花少授粉

在四川黄龙国家公园的一项研究发现，*Phaius delavayi*和*Ponerorchis chusua*二种兰花中，越靠近路径的花成功授粉就越少。研究指该条路径由于在开花季节有很多游客在路上穿梭，致使这两种兰花在路旁十米之内的雌雄繁殖成功率都明显下降。

资料来源：Huang Baoqiang et al., 2009. *保护生物学*142: 701-708.

香港的本豆科植物固氮吗？

对香港28种本土木本豆科植物的研究发现，其中20种有根瘤，即能够固氮。8种不能固氮的豆科植物里，6种是Caesalpinoideae科。这个发现对选择合适植物恢复退化的土地非常有价值。

资料来源：Ng AYS and Hau BCH, 2009. *植物与土壤*316: 35-43.

中国黑脸琵鹭数量下降

1月9日至11日，香港观鸟会协调组织了2009年度国际黑脸琵鹭调查。对于黑脸琵鹭（*Platalea minor*）这种濒危的鸟类，调查中共记录到2,041只，比较2008年2,065只的纪录，这是1999年以来的首次越冬种群数量下降。黑脸琵鹭调查被认为是亚洲单一物种调查一个最好案例，其种群数量已经比2003的1,000只翻了一倍。台湾的越冬种群数量仍是最大的，有1,081只；中国大陆和香港的数量则分别下降到247只(约下降20%)和313只（约下降9%）。

资料来源：
www.birdlifeindochina.org/sites/default/files/Babbler%2029.pdf;
www.birdlife.org/news/news/2009/04/black-faced_spoonbill.html

广西南部 的古生巨猿

广西崇左最近发现的三合大洞已经出土了80多种哺乳动物的化石。在一个潮湿的热带——亚热带森林里，动物有一种 *Pongo* 猩猩，一种 *Hylobates* 长臂猿,乳齿象 *Sinomastodon yangziensis*, 剑齿象 *Stegodon preorientalis*, 一种鹿 *Cervavitus fenqii*, 两种猪 *Dicoryphochoerus ultimus* 和 *Sus xiaozhu*, 一种 *Tupaia*树鼩, 一种 *Ia* 蝙蝠和 *Typhlomys intermedius*猪尾鼠，还有中国迄今为止发现分布最南的 *Gigantopithecus*古猿。其地质年代可以回溯至120万年前。

资料来源：Jin Changzhu et al., 2009. 《中国科学简报》 54: 788-797.

红色名录里的中国物种

中国有333种两栖动物，居世界第7，但其中92种(占28%)受威胁——这居世界第6。华中与华南地区是全球12个受威胁两栖动物分布最集中的区域之一。中国有1,237种鸟，居世界第8，其中85种(占6.9%)受威胁——这居世界第5。中国有551种哺乳动物，居世界第3，其中74种(13%)受威胁——这居世界第5。中国有130种针叶树，是世界最多的，但34种(26%)受威胁，这也是世界最多。中国有20种苏铁，居世界第5，其中12种(60%)受威胁——也居世界第5。中国经评估的2,707个物种中，370种(14%)受威胁；其中的15%为极危，30%濒危，55%易危。

资料来源：Vié JC et al., 2009. *变动世界中的野生生物——2008年IUCN受威胁物种红色名录分析* IUCN, Gland, Switzerland, 180 pp. <http://data.iucn.org/dbtw-wpd/edocs/RL-2009-001.pdf>

国际保护生物学学会：来自亚洲的紧急呐喊

针对保护生物学在亚洲的政治影响非常小的现实，国际保护生物学学会的亚洲部确定了若干关键政策问题希望能使该情况有所改观。作者提出，作为保护生物学的从业者，应该让决策者和大众知道保护生物学和他们所关心的是密不可分的，这些问题包括：人类健康、贸易、能源、经济、农业、极端自然现象和国家安全等。他们建议了若干主要项目：

1. 为森林保护寻找新的资金来源，尤其是通过REDD（减少毁林和森林退化造成的碳排放）；
2. 探讨替代能源对生物多样性保护的潜在影响，比如东南亚油棕种植造成的大规模毁林问题；
3. 遏制毁灭性的野生动植物贸易，其中大部分发生在中国——当务之急是为机场和港口人员提供培训；
4. 重点保护高山生物多样性，它们本来已是特别脆弱又容易受气候变化影响，需要针对保护。兴都库什-喜马拉雅地区的生物多样性与文化尤其倍受威胁。融雪提前和冰川消融将给下游印度和中国的地低平原带来深远影响；
5. 带动更多学科与个人参与及加强关于生态系统的生态、生物、经济和社会研究；
6. 加强对《生物多样性公约》中一些未得到充分关注的关键领域，如外来入侵种等问题的科研投入；
7. 加强对全球环境基金（GEF）的保护生物学支持。作为落实《生物多样性公约》的主要资金来源，GEF制定了新的生物多样性重点领域策略，旨在提高保护区系统的可持续性，建立保护区可持续筹资机制，增加海洋保护区以提高代表性，促进陆地与海洋种养采收区域的生物多样性，培育生物多样性产品及其服务的市场，防止与控制外来入侵物种。亚洲部将致力令保护生物学在确定与实施这些优先领域时被适当考虑；
8. 进一步了解源自动物的传染病，在应对新出现的传染病时，鼓励政策制定者运用恰当的保护科学；
9. 利用保护生物学的知识来调解人与动物之间的冲突；

Orchid pollination reduced by pathway proximity

A study in Huanglong National Park, Sichuan, found that successful pollination in two orchids, *Phaius delavayi* and *Ponerorchis chusua*, was lower in plants closer to a pathway. The path, used by many visitors during the flowering season, depressed male and female reproductive success in both species within 10 metres.

Source: Huang Baoqiang et al., 2009. *Biological Conservation* 142: 701-708.

Do Hong Kong's woody legumes fix nitrogen?

A study of 28 native woody legume species in Hong Kong found 20 with root nodules, able to fix nitrogen. Of the eight non-fixing species, six were in the family Caesalpinoideae. The findings are valuable in selecting species for restoring degraded land.

Source: Ng AYS and Hau BCH, 2009. *Plant and Soil* 316: 35-43.

Black-faced Spoonbill numbers drop in China

The annual International Black-faced Spoonbill Census 2009, coordinated by the Hong Kong Bird Watching Society, took place from January 9 to 11. A total of 2,041 endangered Black-faced Spoonbills *Platalea minor* were recorded during the census, compared to 2,065 in 2008, revealing the first decrease in the number of wintering birds since the 1999 census. The census is considered one of the best examples of single-species population monitoring in Asia. The population had previously doubled from 1,000 in 2003. Taiwan still holds the largest wintering population, of 1,081 birds; the Mainland China and Hong Kong populations dropped respectively to 247 (a 20% drop) and 313 (a 9% drop).

Sources: www.birdlifeindochina.org/sites/default/files/Babbler%2029.pdf;
www.birdlife.org/news/news/2009/04/black-faced_spoonbill.html

Gigantopithecus was in southwest Guangxi

Over 80 mammal species have been found in the recently discovered Sanhe Cave in Chongzuo, Guangxi. In a humid tropical-subtropical forest fauna along with a *Pongo* orangutan, a *Hylobates* gibbon, the mastodont *Sinomastodon yangziensis*, the stegodon *Stegodon preorientalis*, the deer *Cervavitus fenqii*, the pigs *Dicoryphochoerus ultimus* and *Sus xiaozhu*, a *Tupaia* treeshrew, a *Ia* bat and the pygmy dormouse *Typhlomys intermedius*, was found the southernmost *Gigantopithecus* apes yet known from China. The strata date back 1.2 million years.

Source: Jin Changzhu et al., 2009. *Chinese Science Bulletin* 54: 788-797.

China species in Red List

China has 333 amphibian species – 7th-highest of any country – and of these 92 (28%) are threatened – the 6th-highest number. Central and southern China is one of 12 regions with important concentrations of threatened amphibian species. China has 1,237 bird species – 8th-highest – of which 85 (6.9%) are threatened – the 5th-highest number. China has

551 mammal species – 3rd-highest – of which 74 (13%) are threatened – the 5th-highest number. China has 130 conifer species – the highest – of which 34 (26%) are threatened – also the highest number. China has 20 cycad species – 5th-highest – of which 12 (60%) are threatened – 5th-highest number. Of 2,707 species assessed in China, 370 (14%) are Threatened; of these 15% are CR, 30% are EN and 55% are VU.

Source: Vié JC et al., 2009. *Wildlife in a Changing World – An Analysis of the 2008 IUCN Red List of Threatened Species*. IUCN, Gland, Switzerland, 180 pp. <http://data.iucn.org/dbtw-wpd/edocs/RL-2009-001.pdf>

SCB-Asia's urgent call to arms

The Asia Section of the Society for Conservation Biology (SCB) has identified some key policy issues to address the minimal political impact of conservation biology in Asia. The authors challenge practitioners to convince decision-makers and the public of the relevance of conservation biology to the things they are concerned about: human health, trade, energy, economics, agriculture, extreme natural events and national security. They propose various major steps:

1. Develop new sources of funding for forest conservation, notably through Reduced Emissions from Deforestation and Degradation (REDD).
2. Identify potential impacts of energy alternatives on the conservation of biodiversity, learning from the massive forest destruction in Southeast Asia driven by oil palm expansion.
3. Curb the devastating trade in endangered species of plants and animals, dominated by China – training of airport and port staff is an immediate priority.
4. Focus on the conservation of mountain biodiversity, which is particularly fragile and vulnerable to climate change and need specific protection. The Hindu Kush-Himalayas are especially threatened with biodiversity and cultural losses, and earlier snow melt and loss of glacial buffering there will have profound effects on the lowlands of India and China.
5. Enhance relevant ecological, biological, economic and social research on ecosystems, involving many disciplines and individuals.
6. Enhance scientific input into the Convention on Biological Diversity (CBD) on key areas inadequately addressed, such as Invasive Alien Species.
7. Enhance conservation-biology support to the Global Environment Facility (GEF). As the main funding mechanism for the CBD, the GEF has a new Focal Area Strategy for Biodiversity, aimed at improving sustainability of protected-area systems, establishing sustainable financing of protected-area systems, increasing representation of marine protected areas, mainstreaming biodiversity in productive landscapes and seascapes, fostering markets for biodiversity goods and services, and preventing and controlling invasive alien species. The Asia Section would like to build appropriate consideration of conservation biology in determining and implementing these priorities.
8. Build a better understanding of zoonotic diseases, encouraging policymakers to incorporate appropriate conservation science in designing responses to emerging infectious diseases.
9. Address human-animal conflicts through conservation biology.
10. Enhance community-based conservation, especially to defend resources against overexploitation for urban centres.
11. Address pervasive water-deficit problems with integrative attention to biodiversity.

These challenges can be met through improved regional cooperation.

Source: McNeely JA et al., 2009. Conservation biology in Asia: the major policy challenges. *Conservation Biology* 23(4): 805-810. http://www.conbio.org/Activities/Policy/Priorities%20for%20Policy-Relevant%20Conservation%20Research_%20a%20View%20from%20SCB%20Regional%20Sections.pdf



10. 加强基于社区的保护，尤其是保护资源免被城市(利益中心)过度开发；
11. 在处理普遍性的缺水问题时，要综合考虑生物多样性。

通过加强区域合作，这些挑战可望完成。

资料来源：McNeely JA et al., 2009. Conservation biology in Asia: the major policy challenges. *Conservation Biology* 23(4): 805–810.
http://www.conbio.org/Activities/Policy/Priorities%20for%20Policy-Relevant%20Conservation%20Research_%20a%20View%20from%20SCB%20Regional%20Sections.pdf

蝙蝠与鸿鸽对森林适应气候变化作用重大

东亚热带地区种子传播的一份研究报告表明，在破碎化的森林中，以果实为食物的大型果蝠和果鸠对于种子的长距离传播极其重要，因此需要迫切保护它们，免受猎杀。这份报告评估了在该地区种子传播一般可达到的最长距离，及人类活动对其影响。根据各种植物传播载体的不同，估计范围从10米以内到10公里以上，前者包括被蚂蚁搬运或从果实中跌弹出来的，后者则有由风力（对细小种子）、流水、果鸠、大型果蝠（对细小种子）、大象、犀牛以及人类传播。大部分植物种子的最长传播距离为100米到1000米，但是广泛分布、树冠茂密的龙脑香科和壳斗科植物的传播距离通常不到100米。由于大象、犀牛、猿类及其它动物的减少，至少三分之一大型树木的种子传播已经受到影响。

这项研究预计，在陡峭地区，种子的最大传播距离很可能足以使大部分植物物种能够跟随预测的气候变化而改变分布，但在温度与降雨梯度小得多的低地上，预测的气候变化却太快，植物不能靠种子的自然传播来缓解。

资料来源：Corlett RT, 2009. *Biotropica* 41(5): 592–598.

华南重点鸟区目录问世

中国重点鸟区（IBAs）目录由国际鸟盟根据各地区对全球濒危鸟类的重要性而编着——在华南地区，广西省有重点鸟区38个，海南省有13个，广东省11个，香港2个，澳门1个。华南最大的重点鸟区包括广西的龙林县与西林县，大瑶山自然保护区，天坪山，九万山，海洋山，大明山，大王岭自然保护区，架桥岭自然保护区，银殿山和西灵山山脉，西大明山自然保护区，十万大山自然保护区和布柳河自然保护区，广东的南岭以及海南的鹦哥岭。

资料来源：BirdLife International (2009) *Directory of Important Bird Areas in China (Mainland): Key Sites for Conservation*. Cambridge, UK: BirdLife International (English language edition). <http://www.chinabirdnet.org/>

造林行动减少广东一半碳排放，关键在土壤

一项研究表明，广东森林土壤对于缓解气候变化意义重大。自1979年至1998年，广东造林年平均吸收二氧化碳1.18亿吨（其中0.47亿吨被储于植物，0.71亿吨被储于土壤），相当于广东年二氧化碳排放量的一半。1998年的碳吸收率以阔叶林的土壤最大（每平方米14千克），其次是阔叶、针叶混交林（每平方米11千克），针叶林（每平方米7.7千克），以及其它植林（每平方米5.1千克）。经人工恢复，广东省的森林覆盖率由1979年的26%增长至2009年的56%。1998年后的数据未包括林地类型，而之前针叶林增长了42,483平方公里、阔叶林增长了6,882平方公里、混交林增长了1,894平方公里及其它林地类型增长了6,046平方公里。作者也特别强调从源头控制二氧化碳排放的必要性。

资料来源：Peng Shaolin et al., 2009. *Restoration Ecology* 17 (4): 487–494.

外来松树破坏土壤

研究显示，种植外来松树会给土壤结构带来严重的不良影响。在海南省尖峰岭国家级自然保护区，除了对比外来树种植林（加勒比松）与本地树种植林（罗汉松）下的土壤结构，研究者还将之与附近热带森林中的次生林与荒地的土壤结构作了比较。与罗汉松下的表层土壤相比，加勒比松下的表层土壤的松密度较高，土壤中的有机碳、全氮、钾、速效氮及微生物生物量碳含量较低，土壤微生物群落亦较小。两种植林类形都显示，与次生林相比，其土壤退化指数呈负面增长。然而，与荒地相比（土壤退化指数为-262），罗汉松下土壤的退化情况有所改善（-194），而加勒比松下的土壤退化情况则相对较严重（-358）。此结果表明种植本土植物，或让林地自然恢复，都可以提高土壤质量。

资料来源：Wei Yanchang et al., 2009. *Journal of Forest Research* 14(4): 221–228.

中国西南石灰岩地区发现新的十大功劳

在中国的西南部发现一种新的灌木物种 *Mahonia monoden*（小檗科）。目前只在其模式产地广西西南部的天等县和贵州省中部的贵阳市发现这个物种，在贵阳，自2000年采集过后其种群可能已经消失。按照IUCN的标准，这种新物种可列为极危。

资料来源：武建勇等, 2009. 《林奈学会植物学报》*Botanical Journal of the Linnean Society* 159(2): 357–361

鹦哥岭发现一种新的红木

海南发现楝科的一种新物种：*Munronia yinggelingsensis*。这种植物发现于白沙县（南开乡）高峰村附近的鹦哥岭自然保护区山谷里海拔约600米的热带雨林里。

资料来源：张荣京等, 2009. *Nordic Journal of Botany* 27(5): 376–378

Bats and pigeons key to forest adaptation; climate change too fast for lowland forest

Large fruit bats and fruit pigeons are particularly important for long-distance dispersal in fragmented landscapes and should be urgently protected from hunting, according to a review of seed dispersal in tropical East Asia. The review assessed the maximum routine dispersal distances achievable in the region, and their vulnerability to human impacts. Estimates for various plant–vector combinations range from less than 10 m, for species dispersed by ants or mechanical means, to over 10 km for some species dispersed by wind (tiny seeds), water, fruit pigeons, large fruit bats (tiny seeds), elephants, rhinoceroses and people. Most plant species probably have maximum dispersal distances of 100–1000 m, but the widespread, canopy-dominant Dipterocarpaceae and Fagaceae are normally dispersed less than 100 m. At least one-third of large tree species have impaired dispersal due to the loss of elephants, rhinoceroses, apes and other animals.

In steep topography, the maximum seed dispersal distances estimated in the study are potentially sufficient for many plant species to track projected temperature changes. But in the lowlands, where temperature and rainfall gradients are much shallower, projected climate change will be far too fast to be mitigated by natural seed dispersal.

Source: Corlett RT, 2009. *Biotropica* 41(5): 592–598.

South China's Important Bird Areas listed

A directory of China's Important Bird Areas (IBAs) – defined by BirdLife International based on their significance to globally threatened birds – includes 38 sites in Guangxi, 13 in Hainan, 11 in Guangdong, two in Hong Kong and one in Macau. The largest IBAs in this South China region are Guangxi's Longlin & Xilin Counties, Dayaoshan Nature Reserve (NR), Tianpingshan, Jiuwanshan, Haiyangshan, Damingshan, Dawangling NR, Jiaqiaoling NR, Yingdianshan & Xilingshan ranges, Xidamingshan NR, Shiwandashan NR and Buliuhe NR, Guangdong's Nanling Mountains, and Hainan's Yinggeling.

Source: BirdLife International (2009) *Directory of Important Bird Areas in China (Mainland): Key Sites for Conservation*. Cambridge, UK: BirdLife International (English language edition). <http://www.chinabirdnet.org/>

Afforestation offsets half of Guangdong's carbon emissions; soils crucial

A study shows the significance of Guangdong's forest soils in climate-change mitigation. Average annual CO² sequestration from 1979 to 1998 by Guangdong's restored forests was 118 Mt, about half the annual CO² emissions in Guangdong. Of this 47 Mt was in vegetation and 71 Mt was in soil. Carbon storage in 1998 was most effective in the soil of broadleaf forest (14 kg C/m²) followed by mixed broadleaf-coniferous (11 kg C/m²), coniferous (7.7 kg C/m²) and other plantations (5.1 kg C/m²). Guangdong's "forest land" increased through restoration from 26% in 1979 to 56% in 2009. Forest-type breakdown is not given after 1998, but before then the increases were in coniferous vegetation (42,483 km²), broadleaf (6,882 km²), mixed (1894 km²) and other forests (6,046 km²). The authors also note the need to control CO² emissions at source.

Source: Peng Shaolin et al., 2009. *Restoration Ecology* 17 (4): 487–494.

Exotic pines spoil the soil

Research has shown that exotic pine plantations can significantly and negatively influence soil properties. Soil properties under an exotic plantation (*Pinus caribaea*) and a native plantation of *Podocarpus imbricatus* were compared with adjacent secondary forests and abandoned land in the tropical forest areas of Jianfengling National Nature Reserve in Hainan. The surface soil under *Pinus caribaea* had higher bulk density, lower soil organic carbon, total nitrogen and potassium, available nitrogen and microbial biomass carbon, and smaller soil microbial communities, than under *Podocarpus imbricatus*. Both plantation types showed negative cumulative soil deterioration index (DI) compared to secondary forests. However, compared to abandoned land (DI = –262), the soil quality under *P. imbricatus* showed improvement (DI = –194) while that under *P. caribaea* showed deterioration (DI = –358). The results showed that use of native species, or natural regeneration, can improve soil quality.

Source: Wei Yanchang et al., 2009. *Journal of Forest Research* 14(4): 221–228.

New Mahonia from southwest China limestone

A new shrub species, *Mahonia monodens* (Berberidaceae), has been described from southwest China. It is known only from its type locality in Tiandeng, southwest Guangxi and from Guiyang, central Guizhou – and the latter population may have disappeared since its collection in 2000. The new species is Critically Endangered (CR) according to IUCN criteria.

Source: Wu Jianyong et al., 2009. *Botanical Journal of the Linnean Society* 159(2): 357–361.

Yinggeling yields a new member of the mahogany family

A new species of Meliaceae from Hainan has been described: *Munronia yinggelingsensis*. The plant was found growing in the valley rain forests of Yinggeling Nature Reserve at around 600 m in Gaofeng, Baisha County.

Source: Zhang Rongjing et al., 2009. 27(5): 376–378)

Rubber's thirsty habit threatens hydrology

A study shows the limitations of conventional models of evapotranspiration and soil moisture to predict hydrologic changes due to conversion of forest to rubber (*Hevea brasiliensis*). In Nam Ken catchment of Xishuangbanna Prefecture in south Yunnan, root water uptake by rubber during the dry season was found to be controlled by day-length, whereas the native vegetation does not demand water until the first monsoon rainfall. Rubber thus causes depletion of soil moisture in deeper layers. A new conceptual model is now needed to predict hydrologic changes due to land use conversion in the area.

Source: Guardiola-Claramonte M, 2008. *Ecobydrology* 1(1): 13–22.



橡胶吸水成性，不利水文

一项研究表明，因为森林改成了橡胶林，根据水分蒸发蒸腾和土壤湿气预测水文变化的传统模型也许不再适用。在云南南部西双版纳州的南肯流域，专家发现，在旱季，橡胶根部吸收的水与白昼时长有关，而其它的本土植物在季风带来的第一场雨来临之前却不需要水份。因此，橡胶会导致土壤深层的水分减少。这个区域需要一个新的模型来预测因土地利用模式改变而引致的水文变化。

资料来源：Guardiola-Claramonte M, 2008. *Ecobydrology* 1(1): 13-22.

海南废弃道路上的森林恢复：程度有所不同

一项研究发现，在废弃的伐木道路上恢复的森林的组成与结构，与周围的森林相比有了很大的变化。作者在弃道上选取了三个点，对群落的组成、结构和植物的功能特点（种子量和木材密度）进行比较，三个点包括：弃道的路面、路上方的坡缘和路下方的坡缘。在路面上，无论物种的丰富度、树干的多少、树基面积的大小、树干的大小以及林冠层的高度都是最低的。路面上小种子树种比其它二处多，软木树却较少。从硬木树的比较来看，路上方坡缘的硬木树比路下方的物种丰富，但树干量却较低。

资料来源：臧润国, 丁易, 2009. *Acta Oecologica* 35(3): 462-470.

华南灌木地上树木种子少

华南三省从牧场和农田恢复过来的主要植被是灌木。影响灌木地有效管理的因素之一是土壤内的种子库。研究者发现当地土壤里种子的物种不及植被的丰富，而物种的组成结构也与植被的很不同——种子主要是草和灌木的，很少有本地树种的。因此，专家认为树的种子来源限制了次级演替，并建议直接栽种树木幼苗。

资料来源：Wang J et al., 2009. *热带森林科学期刊* 21(3): 210-217. http://findarticles.com/p/articles/mi_7643/is_200907/ai_n35628507/

崇左白头叶猴繁殖良好

对资料的分析发现，广西崇左的白头叶猴繁殖良好，幼猴死亡率低，这些繁殖参数来自弄官喀斯特山地的八年研究数据。全年都有幼猴出生，但主要集中于11月至次年3月的干旱和较冷的月份，受孕时间正好是食物最丰富的时间段。从5—6岁起，雌猴每两年生育一次，20个月内的幼猴死亡率为16%——这在疣猴属里算低的。幼猴在19—21个月断奶。

资料来源：Tong Jin et al., 2009. *American Journal of Primatology* 71: 558-566.

调查未能证实白鲟仍然存世

为评估极危的白鲟——世界上最大的鱼类之一的生存现状，2006—2008年间在长江上游组织了4次大规模的运用水下声音探测的调查与捕捞¹。声音调查记录到9个潜在目标，有2个推测是白鲟。虽然用了总数4,762个带钩鱼线、111个定位带钩鱼线和950个流网捕到472条大型鱼类，但都不是白鲟。当然一些大型鱼类会躲藏起来或逃到深洞里，但白鲟已明显处于灭绝之边缘。确认的上一次目击记录已是2003年了²。尽管有强烈的建议要尽可能保护残存的个体，比如人工饲养、保存基因材料、克隆、或雌核生殖，即迫使未受精鱼籽发育，但这些都需要至少能发现一些活体。虽然在长江上游已建立了一个紧急回应保护网络以救助意外捕获的白鲟，但成本高昂、不易维持。

Source: ¹Zhang H et al., 2009. *Journal of Applied Ichthyology* 25 增刊 2: 95-99. ²http://news.bbc.co.uk/earth/hi/earth_news/newsid_8269000/8269414.stm

猕猴在广西的状况

采访与调查发现在广西的51个县有猕猴分布。文章作者估计其数量应该在17,000只左右，主要分布在西部和西南部的喀斯特地区。栖息地的减少和破碎化是这个物种面临的主要威胁，而且与当地居民之间也常有冲突。作者呼吁要加强立法来保护猕猴及其栖息地。

资料来源：李友邦 等, 2009. *广西师范大学学报（自然科学版）* 27(1): 79-83.

生态学亟待学以致用

拉近研究与实践之间的距离刻不容缓，这从*Biotropica* 杂志的一篇专题文章可见一斑。文章总结了6项主要措施，全部适用于华南地区。首先，应根据科学与社会双方面的产出来制订一套新的评价研究工作成效的标准，以评估业内人士是否有效地将知识与社会分享；第二，应在学术期刊上更多强调知识的转移；第三，应鼓励参与式的研究与跨学科研究；第四，要加强与地方研究机构合作，以更有效地促进知识共享；第五，应推广较长期的研究项目；最后，应对年轻一代的热带生态学家们开展培训，鼓励多做知识共享。

资料来源：Born J et al., 2009. *Biotropica* 41(5): 586-588.

英国剑桥大学保育领袖哲学硕士课程

保育领袖哲学硕士课程专为有领导潜能、并拥有3至5年相关工作经验的本科毕业生而设，为期一年，全日制。本课程的独特之处在于应届生将获得位于剑桥的几所学院和保育组织的联合培养，重点培训领导技能，以便更好地落实保育工作。本课程旨在提供独特的、世界一流的跨学科保育领袖教育。本课程现正招收首批2010年10月开课的学生。课程和奖学金申请截止日期均为每年的4月30日。本课程由英国剑桥大学地理系主办，并由剑桥保育组织(Cambridge Conservation Initiative, CCI)的合作伙伴协办。查询课程结构、申请办法、奖学金，或联系课程总监：nigel.leader-williams@geog.cam.ac.uk

<http://www.geog.cam.ac.uk/graduate/phil/conservation/>

Forest recovery in Hainan: different on abandoned roads

A study finds that the composition and structure of recovering forest stands on abandoned logging roads had significantly changed in comparison with the stands around it. The authors compared the community composition, structure, and plant functional traits (seed mass and wood density) on three positions of abandoned logging roads: road track (RT), road up-slope edge (UE) and road down-slope edge (DE). Species richness, stem abundance, basal area, stem size, and canopy height were all lowest on the RT. The RT had more small seeds but fewer softwood trees than the two road edges. Compared with the DE the UE had a higher and lower proportion of hardwoods in terms of species richness and stem abundance, respectively.

Source: Zang R and Ding Y, 2009. *Acta Oecologica* 35(3): 462-470.

A lack of tree seeds in South China's shrubland soils

The dominant vegetation in three provinces of southern China is shrubland, growing on former pasture and farmland. One influence on the effective management of shrubland is the soil seed bank. The researchers found it low in species richness and quite different to the vegetation in species composition – it was dominated by grass and shrubs with no native tree seeds. The findings suggest secondary succession is limited by tree seed sources, and suggest direct planting of tree seedlings.

Source: Wang J et al., 2009. *Journal of Tropical Forest Science* 21(3): 210-217. http://findarticles.com/p/articles/mi_7643/is_200907/ai_n35628507/

Chongzuo's White-headed Langurs breeding well

White-headed Langurs (*Trachypithecus leucocephalus*) in Chongzuo, Guangxi are breeding quite well, with low infant mortality, according to a review of data. The reproductive parameters were analysed based on eight years of data from Nongguan Karst Hills. Births occurred throughout the year, but peaked in the dry and cold months of November-March; the timing of conceptions coincided with peak food availability. Females gave birth every two years, beginning at age 5-6, and mortality of infants under 20 months was 16% – quite low for colobine monkeys. Infants were weaned at 19-21 months.

Source: Tong Jin et al., 2009. *American Journal of Primatology* 71: 558-566.

Survey unable to confirm survival of Chinese Paddlefish

Four large-range hydroacoustic surveys and capture surveys were conducted in the upper Yangtze River during 2006-2008 to assess the status of the Critically Endangered Chinese Paddlefish (*Psephurus gladius*), one of the world's largest fish species.¹ The acoustic surveys identified nine potential targets, two of them suspected to be paddlefish. A total of 4,762 setlines, 111 anchored setlines and 950 drift net catches failed to catch a paddlefish among 472 large fish specimens caught. While some large fish could have hidden or escaped in rough ground with deep holes, *P. gladius* is clearly on the verge of extinction. The last confirmed sighting was in 2003.² Strong

measures are proposed to save any remaining specimens, such as using surrogates to rear fish in captivity, preserving genetic material, cloning, or gynogenesis, where fish eggs are coerced into developing via parthenogenesis, but all depend on finding live individuals. A quick-response network has been established along the upper-stem of the Yangtze to save accidental catches of the paddlefish, but is costly and difficult to maintain.

Source: ¹Zhang H et al., 2009. *Journal of Applied Ichthyology* 25 Supplement 2: 95-99.

²http://news.bbc.co.uk/earth/hi/earth_news/newsid_8269000/8269414.stm

Rhesus Monkey status in Guangxi

Interviews and field surveys found that Rhesus Monkey *Macaca mulatta* is distributed in 51 counties in Guangxi. The authors estimate the population to be around 17,000, concentrated in karst areas in the west and southwest. The species is threatened by habitat reduction and fragmentation, and is frequently in conflict with local residents. The authors urge greater legal protection for monkeys and their habitats.

Source: Li Youbang et al., 2009. *Journal of Guangxi Normal University (Natural Science Edition)* 27(1): 79-83.

Ecology urged to apply itself

The synthesis of a special section of the journal *Biotropica* emphasises the urgency of tackling the gap between research and implementation. It concludes with six key measures, all with relevance to South China. The first is to create a new set of metrics to measure research success, based on both scientific and social outputs, assessing the effectiveness of sharing knowledge between disciplines and society. The second is to place more emphasis in research journals on demonstrating knowledge transfer. Third is to encourage participation and interdisciplinary research. Fourth is to partner with local institutions and local research centres to more effectively share knowledge. Fifth is to promote longer-term research projects. The last is to train the new generation of tropical biologists in knowledge sharing.

Source: Born J et al., 2009. *Biotropica* 41(5): 586-588.

MPhil in Conservation Leadership, University of Cambridge

The new MPhil degree in Conservation Leadership is a full-time, one-year masters course, aimed at graduates with leadership potential, and with at least three years of relevant experience. It will be run by a partnership between several university departments and conservation organizations based around Cambridge, UK, and will uniquely build leadership skills that improve the implementation of conservation. The course is currently admitting its first students to start in October 2010. The closing date for receipt of applications, for places and scholarship support, is 30 April. The course is based in the University of Cambridge Department of Geography, collaborating with partners in the Cambridge Conservation Initiative (CCI) to deliver the course.

<http://www.geog.cam.ac.uk/graduate/phil/conservation/>



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对复原力进行投资

Investing in resilience

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金融危机之后，为把世界经济推回正轨，各国政府付出了巨大努力。人们也越来越认识到金融与环境、社会问题的紧密联系，但是我们能够对后二者采取同样果敢的行动吗？

当一些人专注于恢复旧有秩序的同时，许多人将这次危机当作重新界定“繁荣”的一次机会——摒弃短期的，不可持续增长，追求持久的繁荣。

英联邦基金会¹曾要求我所属的机构向英联邦内、来自于公民社会、环境、发展和金融各个领域的、各专业顶尖的从业人员和思想家咨询“高持续”的恢复应该是什么样的。在和各财政部长的一次会面中，我们把收集到的意见向他们做了陈述（通常，部长们和生态学家所持的世界观是大相径庭的）。

构筑一个有复原力的新愿景

他们的第一个观点是：我们正处于为时代构筑一个新愿景的时刻，涉及到建立起一个对外来冲击有复原力的经济、尊重并了解自然的限制、公平分配带来的社会公正。

此三个目标互为补充。持续的道德水准提高和切实可行的领导才能把这个愿景变成现实。

他们的第二个观点是：虽然我们在稳定金融上取得了进展，但如果不在相关的环境和社会因素上采取行动，便不能使经济取得持久的复原力。这意味着：1、要投资绿色基础设施——土壤、水体、生物多样性和其它人类健康和发展所依赖的自然资源基础；2、释放出公民社会非正规经济的潜能。此二者需同时迈进，否则我们会重陷危机。

让绿色基础设施不再亮红灯

让我们一起来探视一下被忽视和饱受压力的“绿色基础设施”。

我们的“消费”超越了地球自然系统生产资源和净化废物的能力，这意味着“绿色基础设施”的全球收支帐单上出现了巨大的“赤字”。大家都知道银行业非常重要，因此不能倒闭，但地球肯定更为重要。联合

国千年生态系统评估显示60%的生态系统已经退化，如：75%的海洋渔场开采过度，淡水危机也在逼近。现在情况更每况日下，最近《自然》杂志发表的一篇文章²界定了“地球的九大界限”，有三个已经被人类逾越：气候变化、生物多样性丧失和全球氮循环。然而，大多数国家仍然只有不到1%的财政预算用于修复自然资源的根基。多年来，环境退化不受控制，相关投资短缺。环境资产实在需要我们的投资。

这将使我们在重要的环境危机——气候变化上取得的进展更为完备，全球20个金融危机恢复计划中16%的资金用于支援低碳发展，包括节能建筑、交通和再生能源等。低碳技术（目前已经发展成一个5万亿美元的市场）将推动发达国家的进一步增长。但如联合国环境署申明的，这些只是我们所说的“绿色经济”的一部分。

在发展中国家，重大的机遇来自环境资产。投资于“绿色基础设施”将有利改善贫困的行业发展。联合国环境署认为，发展可持续农业、淡水供应和公共卫生建设的回报最快，它将带来“绿色”的工作职位和生计，而且可以利用太阳带来的能量。或许，我们还可加上可持续林业，比如印度仅有7%的GDP来自森林，但在穷人的GDP总量中占的比例却达到57%。另外，森林还能对人类和整个地球缓和气候变化。

一份回顾了全球400项经济研究的报告³对投资环境资产提出了一些高效益的建议，用低成本而获取较高的地方利益：

- 提供洁净水和公共卫生：获益率高于14:1；
- 保护红树林：获益率高于7.4:1；
- 保护珊瑚礁：获益率高于5:1（加勒比海的珊瑚破坏将带来每年10亿美元的损失，包括渔业、旅游和海岸设施）；
- 水土保持：获益率高于3.3:1；
- 完善灌溉系统：60%的水在输送过程中流失掉。

这些投资可和传统的投资回报率媲美。

我们希望内阁大臣们根据生态系统和生物多样性经济学⁴的结果率先采取行动，这将让我们更清楚绿色基础设施的潜在经济价值以帮助决定开支。

Recently governments have made great efforts to put the world's economy 'back on track' following the financial crisis. Will they be as bold in response to the growing realisation that financial problems are linked to environmental and social problems?

While some are still preoccupied with putting things back the way they were, many see the crisis as a spur to establishing a new paradigm – pursuing not short-lived, unsustainable growth, but lasting prosperity for all.

The Commonwealth Foundation¹ asked my institution to consult leading Commonwealth practitioners and thinkers in civil society, in environment, development, and finance, about what 'high-sustainability' recovery should look like. In a talk to finance ministers – who typically have a rather different view of the world to ecologists – we presented their views.

A new vision for resilience

Their first point was that we are on the cusp of defining a new vision for our times. This comprises an economy that is resilient against disruptions; respect for and understanding of nature's limits; and social justice with distributional equity.

These three goals reinforce one another. Making that vision a reality will now depend upon continued high-level moral and practical leadership.

Their second point was that, while we have made progress on financial stabilisation, economic resilience cannot be achieved without action on the environmental and social contributors to this resilience. This means: (1) investing in 'green infrastructure' – the soils, water bodies, biodiversity and other natural resource foundations of health and development; and (2) unleashing the capabilities of civil society and the informal economy. Progress is needed in both, or we may fall back into further crises.

Bringing green infrastructure out of the red

Let's briefly explore 'green infrastructure', which is neglected and under pressure.

Consumption exceeds the capacity of the world's natural systems to produce resources and to clean up wastes. This means the global balance sheet of green infrastructure is now dangerously in the red. We said the banks were too critical to be allowed to fail – yet the planet is a bigger issue still. The UN's Millennium Ecosystem Assessment calculated that 60% of ecosystems are now degraded. For example, 75% of marine fisheries are beyond exploitation limits, and a freshwater crisis is imminent. The news is not getting any better – a recent major paper² in *Nature* identified nine 'planetary boundaries' and showed we have already exceeded three of them (climate change, biodiversity loss and the global nitrogen cycle). Yet less than 1 per cent of most national budgets is dedicated to nurturing the natural resource base. For years, environmental degradation has been unchecked and investment has been lacking. Environmental assets need our investment.

This would complement the progress we are already making on the big environmental hazard of climate change – 16% of the funds in the 20 recovery packages worldwide support low-carbon development in energy-efficient buildings, transport and renewable energy. Low-carbon technologies (already a \$5 trillion market) will drive growth in the North. But, as the United Nations Environment Programme (UNEP) asserts, these are only part of what we mean when we talk of a 'Green Economy.'

In the South, the big opportunity is in environmental assets. Investing in 'green infrastructure' can drive growth in sectors with high poverty-reduction impact. UNEP identifies the quickest payback from sustainable agriculture, freshwater supply and sanitation, which offer big prospects for generating 'green' jobs and livelihoods and can be 'powered by the sun'. I would add sustainable forestry – for example, forests account for 7% of India's GDP, but 57% of the 'GDP of the Poor' in India – and they buffer all people, and the planet, from climate change.

An earlier review of 400 economic studies worldwide³ suggested some good benefit-cost ratios of investment in environmental assets, capturing many local benefits at low cost:

- Providing clean water and sanitation: up to 14 : 1
- Conserving mangrove forests: up to 7.4 : 1
- Conserving coral reefs: up to 5 : 1 (\$1B a year will soon be lost in fisheries, tourism and coastal infrastructure from Caribbean reef destruction)
- Soil conservation: up to 3.3 : 1
- And fixing irrigation, too – where 60% of water is lost in transit.
- These compare favourably with more conventional investments.

We would like to encourage government officials to take a lead in acting on the results of the 'TEEB'⁴ – the 'Stern Review' equivalent for biodiversity and ecosystems. This will give us a better idea of the economic potentials of green infrastructure and inform public expenditure decisions.

Unsung players

Now a word on civil society, social enterprise and the informal economy: 'under-the-radar' actors who are also unrecognised by recovery efforts – and under pressure. Government responses to the recession principally focus on banks, formal institutions, the macro-economy, and protecting jobs in existing industries. Yet, even in today's financial crisis, it's the 'under-the-radar' players who are being innovative, helping to build resilience for livelihoods and harness the power of 'green infrastructure'. Some examples:

Community groups have been investing their own resources and skills heavily in green infrastructure. In tropical forests, communities invest over \$2.5 billion in cash and labour to conserve forests – more than all international organisations



默默无闻的贡献者

公民社会、社会企业和非正规经济其实担当不为人觉察的重要角色，他们没有被包括在经济复苏行动内，但却饱受压力。政府应对经济危机，通常将焦点放在银行、正规机构、宏观经济和保护现有产业的工作职位。然而，在今天的金融危机中，正是这些默默无闻的贡献者，在创新、在帮助提高生计的复原力并利用“绿色基础设施”的威力，譬如：

社区组织：将他们的资源与能力大量投入到“绿色基础设施”中，在热带森林里，社区投入超过25亿美元的现金与劳力来保护森林，这超过所有国际组织的总投入。如果能清除现存的障碍，例如：权利薄弱和难于取得土地、资金和市场，再配合适当的诱因，他们定能投入更多。

还有许多贫困人士日常的应对策略让人印象深刻，也提醒我们注意这些非正规经济固有的复原力。它能应付较慢的环境变化，并为失业者提供一个保护网。它本身具有灵活性和低运营成本、群体决策，还有大量无形的部分，创造出社会资本的“温床”并减少社会保障的开支。这些在发展中国家尤为重要。据统计，有一半的成人经济活动在非正规经济领域发生。在刚过去的整个全球经济增长期，它也不断增长，但在经济困难期，它又是穷人们的有效避风港。

许多社会企业让穷人也能得到可持续的技术。虽然低碳经济日益为追求利润的私人企业青睐，导致“绿色金融服务”不断涌现，然而这些私人企业对穷人需要的、有利于改善其生活的技术毫无兴趣。幸好非政府组织在不断增多，他们利用从碳汇、小额资助到普通的商业贷款等一系列金融工具，真正为穷人提供益处。我们给十个为穷困家庭提供低碳能源的“社会企业”作了评估，发现它们已经为九百多万人提供了服务，每年减少两百万吨碳排放。在孟加拉，这样的社会企业已为村民安装了数百万块太阳能板。

小型的社会项目同样能达到可观的规模。另一个例子是在印度城市里的社区厕所，迅速扩散的社区厕所公司。这些由城市贫困阶层自己设计、制造与管理，其花费仅为政府设计、承建商建造的厕所的一半。这样的设施需求巨大，要知道，还有十二亿人没法享用正式的厕所。

政府角色

那么，如何真正使经济具有复原力？政治改革和金融革新是必须的，而只有政府，才能采取快速、公平、长期的行动，带来实质性的改变。下面有一些建议：

- 纠正错误：停止对石油、农业和渔业的补贴，这鼓励了对环境资产的破坏和地方对“绿色基础设施”的忽视；消除影响社会企业和社区努力有效性的障碍，比如：土地权属和贸易许可证等；

- 推广良法：增加支援非正规经济的小额信贷；增大采购有利社会与环境资源的产品与服务（政府占有全球27%的市场）；

- 创新金融服务：创建“绿色公债”、“绿色银行”和社会股票交易等，以吸引公众存款到有利长期繁荣、并支持环境产品与服务的投资，比如：马来西亚发行了五亿三千万美元的绿色公债以种植37.5万棵树；

有一个工具可以作为促进政府达到以上方面的第一步^{5,6}：

评估国家财政预算中政府对环境上的开支，这有助于发现增长与社会各界对环境品质的依赖程度与敏感性及提高回报的途径。这也可扩展到刺激方案、新的国际金融稳定委员会（FSB）和国际货币基金组织（IMF）的规例。

我们已敦促政府要记录那些能提高经济复原力的行动，和上面提到对经济恢复作出贡献的各行业领袖们建立网路，并与大学和专业组织联系将人和环境的议题纳入经济与金融的思考与教育。我们建议寻找发展的另类方案，从单纯的GDP增长转到一个全新的目标设定和计算方法，让真正有价值的东西能被计算在内，让反映真正幸福的广泛指标得以量度。

总而言之，我们的建议是“高持续的恢复”不能仅让高踞经济金字塔顶尖的那些特权阶层参与，靠近底层的人也应得以参与并受惠；另外，也不能只看低碳技术，而是要更多投资于自然的“绿色基础设施”。政界领袖们和机构可以在很多方面作出努力来实现这个目标。

此文由2009年10月2日在赛普勒斯举行的英联邦财政部长会议上的谈话改编而成⁷。

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combined. Given their scale and reach, they could invest much more if barriers – weak rights and access to land, capital and markets – were removed and incentives provided.

The impressive day-to-day ‘coping strategies’ of many poor people alert us to the inherent resilience of the informal economy. It can cope with slower-moving environmental changes, and cushion dropouts from formal employment. It’s inherently flexible, with lower overheads, communal decision making, and a plethora of intangible aspects that create a ‘trampoline’ of social capital and can reduce social protection costs. In developing countries it is very significant – by some measures, about half of economically-active adults work in the informal economy. It has also grown throughout the last period of global economic growth. But during weaker economic times, it is a harbour in a storm for many poor people.

Many social businesses are already enabling poor people to access sustainable technology. Emerging ‘green’ financial instruments are based on the assumption that low-carbon business is driven by the profit-motivated private sector, but the latter is not attracted to reaching the poor with technologies that could improve their lives. A growing number of “hybrid” non-government/commercial organisations are drawing on financial instruments, ranging from grants to carbon credits to regular commercial loans. They can deliver real benefits. We reviewed ten of the better hybrid enterprises providing low-carbon energy to poor households: they had already served over 9 million people, saving 2 million tons/year in carbon emissions. A million solar panels are now in villages in Bangladesh through such a social business.

Small, social projects can reach scale, too. Another example is the rapid spread of community toilet enterprises through many Indian cities – they are designed, constructed and managed as community toilets by organizations formed by the urban poor and costing half as much as those designed by the government and constructed by contractors. We need more of this kind of thing, with 1.2 billion people still practising open defecation.

Government roles

So how to enable this economic resilience? The need for institutional reform and financial innovation is inescapable. Only government can act fast enough, equitably enough, and for long enough to really invest in changes required. Here are a few ideas of what to do:

Stop bad practice. Halt fossil fuel, farming and fisheries subsidies where they are perverse incentives to degrade environmental assets or neglect local green infrastructure. Remove barriers to effective social enterprise and community effort, like rights to land and trading permits.

Scale up good practice. Improve microcredit to support the informal economy. Increase public procurement of socially and environmentally sound goods and services (27% of global markets are entirely in government hands).

Develop new financial practice. Innovations such as ‘green’

bonds, ‘green’ banking and social stock exchanges can get people saving again for long-term prosperity, and support investment in environmental goods and services, such as Malaysia’s \$530 million green bond for planting 375,000 trees.

One tool seems a useful first step to help government achieve these:^{5,6}

Public environmental expenditure reviews of national budgets – which review the dependence and sensitivities of growth and social sectors to environmental quality, and ways to improve returns. This might be extended to stimulus packages, the new international Financial Stability Board, and IMF rules.

We have urged governments to catalogue ‘what works’ for economic resilience, to network leaders in various sectors who have helped to make the kinds of progress I describe, and to link universities and professional associations to get issues of ‘planet’ and ‘people’ into our economics and finance thinking and teaching. We have suggested they explore alternative measures of development, moving from an obsession with GDP growth to new ways of goal-setting and accounting aimed at a vision where truly valuable things are actually valued, and the breadth of real wellbeing is measured.

To sum up, our proposition is that ‘high-sustainability recovery’ must engage and support not only the privileged at the top of the economic pyramid, but also those near the bottom – and not only ‘low-carbon’ technology, but also investments in natural ‘green infrastructure’. There are many ways in which leaders and institutions can help make this happen.

This article was adapted from a talk given to the Commonwealth Finance Ministers Meeting, Cyprus, 2 October 2009.⁷

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发展的基础和保护的作用

Development fundamentals and the role of conservation

收集整理：费乐思 (香港嘉道理农场植物园)
Compiled by John Fellowes (KFBG)

人类的大部分财富，均来自为我们提供能量及物质需求的生态系统，然而这却常为经济学家们所遗忘。几个世纪以来，人类生活在一个能源供应持续扩张的世界，包括：煤和泥炭（特别从18世纪开始）以及石油和天然气（主要从19世纪开始）。和人类其他的主要需求一样，化石燃料同样来自于生态系统的服务功能。但实际来说，化石燃料无法再生，因为它们来自于那些早已不复存在的海洋及陆地生态系统。

目前在全球大部分地区，化石燃料使得人们放弃使用更传统的能源。20世纪食品生产量的急剧增长，很大程度归功于能源投入^{1,2}。普通香港居民现在每年家用能源为1.3百万瓦小时³，相当于17,500个小时在农场工作的耗能，或者9个虚拟奴隶4的劳动能力。有了这一能量上的补助，“进步”通常伴随着生产效率的大大降低⁵。以美国的食物生产系统为例，它所消耗的能量是它创造的能量的10倍6。如此一来，年轻的一代及他们的后代，只能继承到前人拥有资源的一小部分，却要为先辈对生态系统与气候史无前例的破坏，付出巨大的代价。

经济随着可利用的能源而增长。今时今日，原本用来购买商品和服务的金钱已大多用于购买古老生态系统服务。在如此独一无二的历史条件下，经济越来越快的增长已成为预期中会发生的事了。持续膨胀的好处使得人们相信并且表现得好像生产的问题已经被解决了，用E.F.舒马赫的话来说，这是一个荒诞而且是自取灭亡的错误。⁷

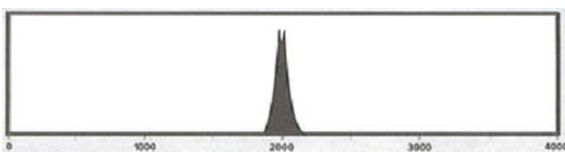
挥霍掉的遗产

坏消息是，我们已经差不多到达了这一漫长的能源供应扩张时代的尾声^{2,8}。在20世纪50年代，全球对新油田的发现已达到了顶峰。尽管近年来勘探技术越发先进，但剩在地下的石油却需要高额的代价来开采。在达到了毫无前兆的生产顶峰后，全世界48个最大的石油生产国中，有33个的石油产量正在下降。预测的中位数是，全球石油总产量将在2010年前后达到顶峰⁹。这意味着我们很快将进入能源衰退时代，即：能源总供应量减少，人均可用能源减少得更快，而能源投入产出比将减少得还要快得多。这些现象及其对社会造成的巨大影响，通常被称为“石油顶峰”。

严峻的现实

这一可用能源的大衰退在全球尚无先例，但历史中却充满了很多小规模案例，大部分都是以悲剧收场¹⁰。例如：我们最近看到的燃料和食品价格的剧烈波动，很久以前就被预测是对石油顶峰的反应。也许我们已经到达了工业革命和“绿色革命”所造就的人均产量的顶峰。和过去50年里的其他价格上涨事件不同，2006年至2008年（经济衰退之前）的全球谷物价格上涨不是因为某一特殊事件（例如季风严重变弱或干旱等）引起的，而是一种趋势¹¹。更令人担心的是，一个没有了石油的地球究竟可以承载多少人？以20世纪初的人口总数为基准，一个可靠的估算是20亿¹²。

历史上的石油时代



图表来源：<http://www.lifeaftertheoilcrash.net/>

我们面临石油顶峰的同时，也同时要面对另一个前所未有的挑战——气候变化。大多数气候学家认为，我们正朝着灾难性的方向前进——全球气温在本世纪内会上升3至5摄氏度¹³。大气碳含量的各种来源都在不断增加，而海洋、森林、泥炭地和永久冻土等长期碳汇的储碳功能，却在过去的50年里降低了8%左右^{14,15}。即使在短期内，气候变化会使得依赖降雨的农田庄稼产量在2020年减少一半¹⁶。海洋酸化等无法避免的影响^{17,18}，会大大降低地球的承载能力，更不用说那些本可避免的、因温室气体排放持续增多而造成的影响了¹⁹。

当然，石油顶峰和气候变化是相关联的，都是拿地球循环系统来做实验的后果。它们把我们带进了一个新的时代，一个不安全的时代。全球目前有一半的人口居住在城市，很多人都不了解基本的粮食种植技术，并且将生活必需品委托给庞大的机械化耕种与运输作业。我们比过去任何时候都更加经不起打击²⁰。

当下，很多人基于现有的经验仍认为全球经济增长是首要的，而对于人口过多、气候变化和能源短缺等问题，我们只需要做出小小的改变即可。然而，现有的

Although economists often forget it, most human wealth comes from ecosystems, which supply our energy and material needs. For hundreds of years humans have lived in a world of expanding energy supplies: coal and peat (especially from the 18th Century), oil and gas (mainly from the 19th Century). These fossil-fuels, like our other major needs, can be seen as ecosystem services. But for practical purposes they are irreplaceable, from ecosystems, oceanic and terrestrial, that have long ceased to exist.

Globally and in most regions these sources now dwarf more traditional sources of energy. The dramatic increase in food production during the 20th century was largely attributable to energy inputs.^{1,2} The average Hong Kong resident now uses 1.3 MWh of energy at home each year³ – equivalent to 17,500 hours of farm-work, or nine “virtual slaves.”⁴ With this energy subsidy, “progress” has often been accompanied by huge reductions in efficiency;⁵ the US food system, for example, consumes ten times as much energy as it produces.⁶ As a result younger and future generations are left with a fraction of the resources their forebears had. Many of the costs – the unprecedented damage to ecosystems and to climate – have yet to be paid.

The economy has grown with energy availability, as money – a claim on goods and services – is mostly now associated with claiming these ancient ecosystem services. In these historically-unique conditions, exponential economic growth has become the expectation. The expanding benefits have brought people to believe and act as though the problem of production has been solved – in the words of E.F. Schumacher, an “absurd and suicidal error.”⁷

Frittered inheritance

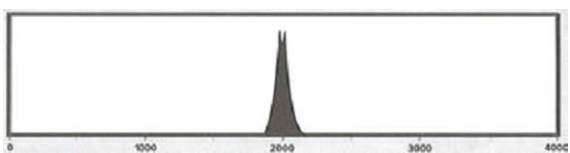
The bad news is, we’ve about reached the end of that long era of expanding energy supplies.^{2,8} Global oil discovery peaked in the 1950s despite subsequent technological advances, and the oil left underground is the most expensive to extract. Oil production is declining in 33 of the world’s 48 largest oil-producing countries – following peaks that occurred without warning – and the median prediction for a global peak is around 2010.⁹ This means we will very soon be in an era of energy decline: in total availability, (more rapidly) in per capita availability and (far more rapidly) in energy return on energy invested. These phenomena, and their enormous implications for society, are often known as “peak oil”.

Hard truths

We have no global precedent for this vast decline in energy availability, but history is littered with smaller-scale stories – most with unhappy endings.¹⁰ Wild fluctuations in prices of

fuel and food, as seen recently, have long been predicted as responses to peak oil. Perhaps we have already reached the peak of per-capita production enabled by the industrial and “green” revolutions. The 2006-2008 (pre-recession) global surge in grain price, unlike others in the past half-century, could not be attributed to a particular event (such as a major monsoon failure or drought) – it was a trend.¹¹ More alarming, there are doubts as to the carrying-capacity of Earth without oil. Two billion (the population at the start of the 20th Century) is one credible estimate.¹²

The oil era in history



The oil era in history from <http://www.lifeaftertheoilcrash.net/>

Peak oil confronts us at the same time as another unprecedented challenge: climate change. Most climate scientists think we are on course for a catastrophic 3-5°C rise in global temperature this century.¹³ Sources of atmospheric carbon are still escalating, while long-term carbon sinks, such as oceans, forests, peatlands and permafrost, have reduced their functioning by some 8% in the last 50 years.^{14,15} Even in the short term, climate change could halve yields of rain-fed agricultural crops by 2020.¹⁶ Unavoidable impacts such as ocean acidification,^{17,18} let alone the avoidable ones from continued emissions increases, could lower Earth’s carrying-capacity substantially.¹⁹

Of course peak oil and climate change are connected – the result of uncontrolled experiments with global cycles. Together they bring us into a new era, and it is not a secure one. Half the population now live in cities, many of them unaware of basic food-growing techniques and entrusting their essential supplies to giant mechanised operations of growth and delivery. We are more vulnerable to shocks than we have ever been.²⁰

Many people today believe, based on recent experience, that the global growth economy is the priority, and that we simply need to make minor adjustments in the light of overpopulation, climate change and energy shortage. Current evidence forces us to challenge this dogma.²¹ A related assumption is that intensive agriculture is the answer to population growth. But the past economic advantage of intensive agriculture has depended on high inputs and predictable conditions – neither of which we will have. It also tends to deplete soil and release greenhouse gases – something we definitely can’t afford. If intensive agriculture is the answer, it needs to be of a different kind.²²



证据使我们不得不对这一信条提出质疑²¹。一个相关的假设是，集约耕作是解决人口增长问题的答案。但是过去的集约耕作在经济上的优势是依赖“高投入”和“可预测的环境”，而这两个条件现已不复存在。况且，集约耕作也更容易耗尽土壤营养和释放温室气体，这肯定是我们无法承受的。如果集约耕作仍是出路，它需要一种完全不同的操作方式²²。

依靠基于科学的效率提高和改革全球的不平等现象的同时，对我们所面临的窘境最诚实的回应是：采纳经济收缩和本土化从而降低能源使用，就算我们现在不做这些改变，将来也会迫于无奈这么做。不管我们从效率和分配方面能节省多少，我们也必须放弃那些“虚拟奴隶”。

顶峰后的生物多样性保护

那么，生物多样性的保护会何去何从？就算没有石油顶峰和气候变化，我们还是进入了一个生物大灭绝的时代。有着这样一个经济和气候都毫无保障的未来，生物多样性的保护现在是否就成了一个我们负担不起的奢侈品？

我认为不是。能源危机和气候变化都会给生物多样性带来越来越多的影响。生物燃料、水力发电和薪柴砍伐会破坏自然生态系统。而生态系统也会挣扎着对气候变化作出适应²³。随着人口持续增长，并且部分现有主要耕地变得过于干旱、多雨、炎热或无法预测的情况下，农业可能会转移到边缘土地范围上，我们将会因此损失更多森林。使用者和保护者之间的矛盾会更加尖锐，而保护区将会遭受到新的压力。

但，这也是一个机遇。化石燃料的应用给予了我们很多，也同样拿走了很多。燃料的使用使我们脱离了生态的限制与循环，将我们带入了今天营养供应和气体生产的不平衡格局中。石油顶峰将会重新把我们带回到这个限制与循环中，不论我们是否愿意。

为复原力而发展

与生态重新接轨有些不容妥协的地方：

1. 气候必须恢复至并保持在人类和其他生物所适应的水平。这就意味着要将大气二氧化碳浓度由现在的百万分之390迅速降低到百万分之350以下²⁴。这同样也意味着我们要赶在大错铸成以前，从根本上限制累计碳排放量：如果能将其限制在7500亿吨，我们就有75%的机会将气温升幅控制在2°C的底线之内^{25,26}。鉴于我们已经排放了530亿吨，我们还必须每年减排4.6%，并要立即采取行动²⁷。
2. 保护并恢复对人类生命至关重要的生态系统服务功能²⁸。这不仅包括人们相对熟悉的供需服

务（例如仅渔业一项，如果管理得当，每年可以额外获得500亿美元的收益²⁹），它还包括调节、支持和文化服务，这些服务在中国不大为人所知³⁰。土壤中生物和自然植被的减少，不应被看作是自由经济所产生的“间接损失”，而必须扭转过来。一些针对这些问题的补救措施更能够借着碳截存抗衡温室效应^{24,31,32}。地球土壤储存着大约15,520亿吨的碳¹⁶。陆地生态系统中储存着大量的碳，其中森林储存率将近50%，草原为34%，而泥炭地为25%¹⁶。陆地生态系统每年已经从大气中吸收三十亿吨的碳，并且还有潜力储存更多。地球土壤碳截存率如能提高3%，我们就能够将大气中的碳含量降至百万分之350³³，这是可以通过以下方式实现的：如：减少犁地、肥料的使用及防止土壤侵蚀、添加生物碳、耕种更多多年生农作物、减少和调整畜牧养殖、保护和恢复植被等³²。热带地区的森林保护与恢复，对通过蒸发冷却地球尤为重要³⁴。由此可见，世界农业需要综合考虑食物安全、缓解与应对气候变化以及发展等问题，以寻求一个整全的前进方向^{22,29,30,35,36,37}。

3. 将人类资源消耗恢复到地球自然资源能够承受的范围内。为了减少未来资源短缺带来的影响，人口必须尽快达到顶峰，人类也要重新学习如何高效使用资源。我们需要一种能够共同应对气候与能源危机的社会凝聚力，这也能促使我们想出一个更加健康、更加全面的方法来保护土地。一个地区性的挑战，是如何对抗危害生态系统和农村社会长远生存的非法野生生物贸易。
4. 从生物多样性中重获保障。复原能力强的系统需要多样性。所有物种受到的物理影响正随着气候而变化，生态系统需要保持纬度、海拔以及降雨坡度上的连贯性。农户需要对不确定因素做好应对准备，生态系统则需要相互连接才能适应。我们必须恢复健康的混合运用土地的模式，令保护区“荒岛”可以连接起来，这是保护生物多样性所必需的³⁸。

以上各点勾画出更具复原力的未来，这是我们要选择的方向。自然保护和生态，都是未来发展基础的必要组成部分。

那么，本世纪将无可避免地出现人口崩溃吗？如果我们继续这样发展，置自然资本于不顾的话，人口崩溃的确是无法避免的。但是我们依然有很多事情可做起来避免它发生。其中一件就是把人类智慧重新运用在资源管理上。美国最小的农场通过对环境更亲密、更熟练的运作，农地产量是美国最大农场的60倍³⁹。小规模、高产的永续农耕，也许是最有可能实现可持续供养70亿以上人口的办法。要避免饥荒，我们必须大力振兴农业系统的可适应性、创造性和令它更“聪明”。人类只考虑金融资本的做法必须让位于对人类与自然的投入。

Alongside science-based improvements in efficiency, and reform of global inequality, most honest responses to our predicament involve facing up to some form of managed energy descent or “powerdown”, with economic contraction and localisation, before these processes are forced upon us. Whatever savings we can make in efficiency and distribution, we're going to have to start laying-off those “virtual slaves”.

Biodiversity conservation after the peak

So what about conservation? Even without peak oil and climate change, we had entered a great mass-extinction of species. With an insecure future economy and climate, is biodiversity conservation now a luxury we can't afford?

I think not. Both the energy crunch and climate change will increasingly impact biodiversity. The expansion of biofuels, hydropower and logging for fuelwood will damage natural ecosystems, as they struggle to adapt to new climate conditions.²³ As population continues to grow, and as some current intensive-farming areas become too dry, wet, hot or unpredictable, farming may shift into still more marginal lands, with further loss of forests. Protected areas could come under new pressure, with heightened conflict between extractive users and those responsible for protecting wider ecosystem services.

But it's also an opportunity. For all fossil fuels have given us, they have taken a lot too. Fuel use has taken us out of ecological limits and cycles and into today's imbalances in nutrient supply and gas flows. Peak oil will take us back (willingly or not) into these cycles.

Development for resilience

Our ecological realignment has some non-negotiables:

1. **Restore and maintain the climate** to which we and other life forms are adapted. This means bringing atmospheric carbon dioxide concentration quickly below 350 parts per million²⁴, down from 390 today. It also means a fundamental limit on cumulative emissions before we run into serious trouble: 750 GtC to give us a 75% chance of staying within 2°C of the baseline.^{25,26} Given that we're already at 530 GtC, this calls for a 4.6% annual reduction, with no time to lose.²⁷
2. **Safeguard and restore the ecosystem services** essential to human life.²⁸ These include not only the relatively well-known provisioning services – fisheries alone could generate an additional US\$ 50 billion per year if properly managed²⁹ – but also the regulating, supporting and cultural services. All these are poorly understood in China³⁰. The declines in soil life and natural vegetation, instead of being seen as “collateral damage” of a free economy, must be reversed. Some such remedial measures could counter the greenhouse effect through carbon sequestration.^{24,31,32} Global soils store some 1,552 gigatonnes of carbon (GtC).¹⁶ Terrestrial ecosystems have huge stores in forests (about half), grasslands (34%) and peatlands (25%),¹⁶ and terrestrial ecosystems already remove 3 GtC per year from the atmosphere, with the potential to store far more: just a 3% increase in global soil carbon could return the atmosphere to 350 ppm.³³ This

could be achieved by minimising tillage, fertilizer use and erosion, adding biochar, using more perennials, reducing and modifying livestock, protecting and restoring vegetation.³² Forest conservation and restoration in the tropics are especially important for evaporative cooling.³⁴ World agriculture thus needs a more holistic vision that synergises considerations of food security, climate change mitigation and adaptation, and development.^{22,29,30,35,36,37}

3. **Bring human resource consumption back within the limits** this natural capital can sustain. To reduce the impacts of future shortages, population will need to peak as quickly as possible, and efficient resource-use must be re-learned. The kind of community cohesion needed to address the climate and energy crisis could enable a healthier, more holistic approach to land care. A regional challenge is to combat the illegal wildlife trade that threatens both ecosystems and the long-term viability of rural communities.³⁸
4. **Restore insurance from biological diversity.** Resilient systems need diversity. The physical influences on all species are changing with climate, and ecosystems need continuity along latitude, altitude and rainfall gradients. Farmers need to hedge their bets against uncertainty, and ecosystems need connectivity in order to adapt. We must revive the healthy living matrix on which our islands of protected biodiversity depend.

Together these spell out a future of greater resilience – the direction we need to take. Nature conservation and ecology are integral to all these fundamentals of future development.

So is a population crash inevitable this century? It is if we continue to “develop” without regard for natural capital. But there is everything to play for. One thing we need to do is put human intelligence back into resource management. In the US the smallest farms, run with greater intimacy and understanding, have yields 60 times those of the largest.³⁹ Productive permaculture at the small scale is perhaps our best chance of sustainably feeding a population above seven billion. Averting famine will call for a great revival in the adaptability, creativity and intelligence of farming systems. Our fixation on financial capital must give way to investment in people and in nature.

Positive visions

People are not attracted to negative visions of the future – hence the ecologist's common experience to live “alone in a world of wounds”.⁴⁰ Fortunately, many of the necessary responses to peak oil and climate change – reducing motorised traffic, localising food, clamping down on products from rainforest areas, designing better buildings – could also raise the quality of human life.

A source of inspiration is the “Transition” movement.⁴¹ Transition is a package of approaches and ideas to support community-led responses to peak oil and climate change, building resilience and happiness. Evolving from the systems thinking of permaculture, Transition Initiatives thrive on creating positive, tangible visions of a community that will take it beyond its fossil-fuel dependent present. They have spread at





正面的前瞻

人们不会被消极的未来所吸引，因此生态学家常常哀叹：“孤单的居住在一个千疮百孔的世界中”⁴⁰。幸运的是，我们对于石油顶峰和气候变化必须做出的应对措施，例如：减少机动化交通工具、食物本地化、取缔来自雨林地区的产品、设计更优化的建筑等，同时也可以提高人们的生活素质。

其中极具启发性的一项行动是“转化运动”(Transition movement)⁴¹。这是一个将方法和思想结合，支持以社区主导的形式对石油顶峰和气候变化作出回应，增加社区的复原能力并给予社区成员快乐体验。转化行动的成功有赖于展示一个正面的、实实在在的社区蓝图，带领社区超越现今依赖化石燃料的时代。“转化运动”在全世界迅速撒播开来，在2009年2月，香港嘉道理农场暨植物园已很荣幸的举办了中国的第一个“转化培训班”。

“转化”意味着我们要结束近几十年严重的愚昧无知以及对自然的贬低。它要求人类的需求要符合自然现实；我们需要接受再教育，以将我们集体的智慧由利用石油转移到与自然的明智合作上。

自然保护并不是资金短缺时便要抛弃的奢侈品。它是廉价石油时代的冒险实验结束之后，我们重回平安之路的保证。🌱

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a dramatic rate around the world; in February 2009, KFBG was pleased to host the first Transition Training workshop in China.

The transition needs to end the spectacular ignorance and devaluing of nature that characterises recent generations. It needs human demands to be brought in line with physical realities. We need re-educating; to switch our collective intellect from exploiting oil to working intelligently with nature.

Conservation is not a luxury to be discarded when money is tight. It is our way back to safety from the dangerous experiments of the cheap-oil era.

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联合国气候变化框架公约第15次缔约方会议摘要

Roundup from COP 15 of the UN framework convention on climate change (UNFCCC)

收集整理：费乐思 (香港嘉道理农场植物园)
Compiled by John Fellowes (KFBG)

第15届联合国气候变化框架公约缔约方大会（COP 15）同意将2009年12月18日定下的哥本哈根协定记录在案。此项协定经大会以外非正式途径由美国与中国、印度、巴西、南非和欧盟拟定。这一结果对于气候稳定与森林生物多样性来说算得上成功吗？以下的分析根据不同的来源得出：

好消息

这是首次超过100位世界领导人和192个国家与会代表聚集在一起制定一个针对气候变化的全球性解决方案。今时今日，气候变化在各个国家已成为主要的政治问题。人们对气候变化的科学依据不再质疑。哥本哈根协定为2010年各缔约国再次聚首，就减排目标进行磋商与达成协议提供了基础。联合国秘书长潘基文承诺一定要在2010年敦促各方达成具备法律约束力的协定。

大部分与会国（112个国家）一致支持将大气中二氧化碳浓度降低到350ppm以下这一号召，希望可以将全球平均气温升幅控制在1.5℃以内。

哥本哈根气候协定承认有必要将全球气温控制在高出工业革命前水平2℃之内，以及有必要尽快令全球及各国温室气体排放达到顶峰。

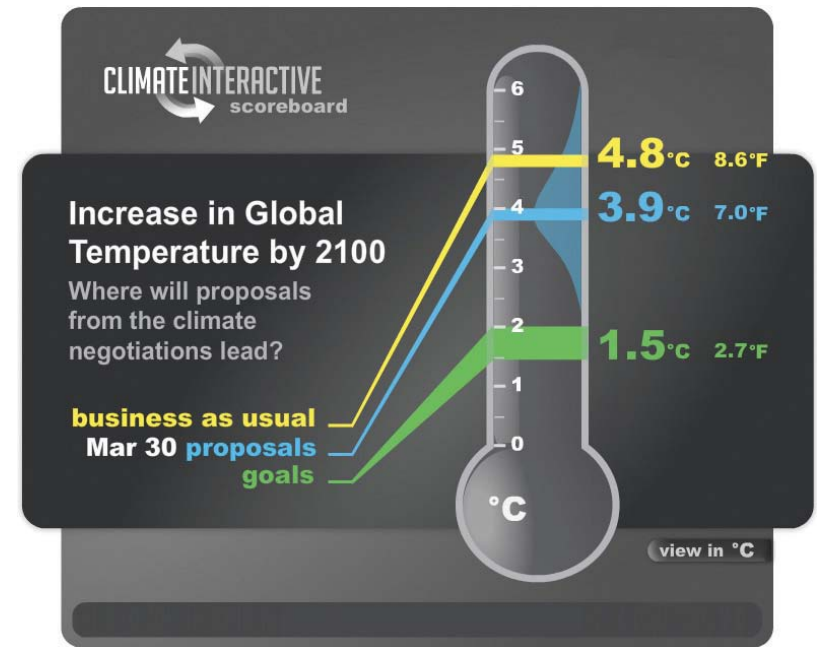
坏消息

尽管此次大会延期结束，并且被授权达成一项新的对抗气候变化的全球性解决方案，但大会缔约国最终没能达成一个有约束力的协定。各国不接受若不执行哥本哈根协定便会受国际法法律制裁的提案。此次谈判草草收场，最终以少数国家领导人在最后时刻定下的仓促协定告终，并且该协定并未详尽阐明任何条款细节。未能为碳市场确定详细的框架协定导致欧洲的碳价格跌至高峰期以来六个月内最低水平。

中国、美国、俄罗斯、印度、日本、德国、加拿大以及英国等最强大、污染也最为严重的国家并未同意将大气中二氧化碳浓度减少到350ppm及将全球平均气温升幅控制在1.5℃以内这两项有科学依据的减排目标。

全球污染排放应在2050年降到50%以下及在2015至2020年达到顶峰的这两个目标在协定中剔除了。根据联合国政府间气候变化专门委员会的要求，以上两个目标都是将温室气体浓度保持在450ppm范围内及避免灾难性的全球气温升幅超过2℃所必须达到的。

工业国家须在2050年实现温室减排气体80%的提案也被否决了。目前的排放目标远不能达到将气温升幅控制在2℃的要求。苏丹与会代表表示，全球气温升高2℃，对于非洲大部分地区来说很可能意味着升高3.5℃。这必将给该地区带来灾难。



The 15th UNFCCC Conference of Parties (COP 15) agreed to take note of the Copenhagen Accord of 18 December 2009, formulated outside the formal COP channels by USA, China, India, Brazil and South Africa with the EU. Was the outcome a success for climate stability and forest biodiversity? The following analysis draws on a variety of sources.

Good News

For the first time, over 100 world leaders and 192 countries convened to work out a global deal on climate change – now a central political issue in every country. The basic science of climate change is no longer contested. The Accord provides a basis for negotiations and agreement in 2010, when Parties have agreed to meet again to discuss targets. UN Secretary General Ban Ki-moon said it must be made legally binding in 2010.

Most (112) countries have now endorsed the call to reduce atmospheric carbon dioxide (CO₂) below 350 parts per million (ppm), in an attempt to limit global warming to 1.5°C.

The Accord recognises the need to limit global temperature rise to 2°C over pre-industrial levels, and to achieve the peaking of global and national emissions as soon as possible.

Developed countries promised \$30bn per year of additional funding for adaptation (for countries most in need) and mitigation in “developing” nations in 2010-2012. They aim to mobilise \$100bn a year by 2020.

Bad News

Though the latest of 15 COPs, and mandated to agree a new global deal on tackling climate change, COP 15 failed to reach a binding agreement. Countries did not accept the threat of legal sanction under international law. Negotiations ended with a last-minute rushed agreement by a few leaders, with very little detail. There was no detailed framework on carbon markets, and carbon prices in Europe dropped to a six-month low after the summit.

The most powerful and polluting nations, such as China, USA, Russia, India, Japan, Germany, Canada and UK, have not endorsed the science-based targets of 350 ppm CO₂ or 1.5°C.

Initial agreements that global emissions should be 50% lower by 2050, or should peak by 2015-2020, were removed. According to the IPCC both targets are necessary to stabilise greenhouse-gas concentrations at 450 ppm and avoid disastrous global temperature rises of >2°C.

An initial agreement for industrialised countries to reduce emissions 80% by 2050 was also rejected. Current emissions targets get nowhere near the 2°C goal. Sudan said even a global 2°C increase would likely mean a devastating 3.5°C increase for much of Africa.

NGOs and the World Bank said the funding pledged to help the poorest countries adapt is far too little. It will not be all in the form of unconditional grants. The source of the money is unclear.



好消息

发达国家承诺每年将提供300亿美元的额外资金，用于在2010至2012年间帮助最有需要的国家应对气候变化，以及帮助发展中国家减温室气体排放。发达国家计划在2020年将每年筹集的资金提升到1000亿美元。

发达国家与发展中国家正在研发低碳经济计划，并接受核查的需要。各与会国被要求在2010年2月1日前，阐明其在2020年之前控制碳排放量的承诺。需要获得国际援助的应对气候变化措施方面的承诺，将会被记录在案。富裕国家提出的减排承诺将会接受联合国气候变化框架公约的审查。发展中国家需要提交关于减排承诺的国家报告。

该协定包含了建立机制，以鼓励技术研发并向发展中国家进行技术转移的决定。

即使该协定的批评者也意识到此协定非常含糊，在未来几个月的商讨只能令它更好。

2015年将对该协定的执行情况进行评估。

协定认同减少由砍伐森林和森林退化导致的温室气体排放（REDD）的重要性，以及提高森林降解温室气体的需要。协定同样同意了通过“REDD+”机制为这些行动提供积极动力的需要，并从发达国家调集资金。缔约国在（REDD+）计划的关键技术指南方面达成了一致意见。

100亿美元的快速通道资金中，20%将被用于减少滥砍滥伐和森林退化产生的碳排放（REDD+）计划。澳大利亚、法国、日本、挪威、英国和美国承诺提供35亿美元用于减少贫困国家的森林砍伐。

制定了保护措施与准则，内容涉及生物多样性、生态系统服务与防止天然森林改成人工林。

发展中国家被要求找出造成导致温室气体排放的砍伐与森林退化的因素，以及解决它们的方法。它们亦被要求找出能够促使减排、提高温室气体移除，稳定森林碳储藏量的行为。

要求发展中国家建立强健而透明的国家森林监察系统，如果适用的话，也建立起地方监察体系。

该协定确实为进一步商讨留下了余地，使得各谈判方可以减少鼓励天然林改为人工林的风险。

坏消息

民间组织和世界银行均表示，帮助最为贫困国家应对气候变化方面的资金承诺远远不够。此项承诺不是全部通过无条件援助的形式提供。而此项资金的来源仍是不清楚。

协定没有规定要求富国报送关于污染排放的具有透明度的报告，尤其是在土地使用核算方面。这很可能会严重降低他们所设定的所有具有法律约束力的减排目标。除非发达国家为发展中国家支付所需费用，否则无法核查发展中国家所采取的行动。

研究对发展中国家技术转移的专家对于没有达成有约束力的技术转让结果而感到失望。

许多气候科学家认为，全球气温正迈向毁灭性的5至8℃飙升，就算采纳了目前提出的缓解措施，也不会有大的改观。

到2015年，若想要采取一个新的、更低的全球平均气温目标，例如上升1.5℃，可能已经为时已晚。

会议没有同意具有法律约束力的方法来推动REDD向前迈进。决议草案缺少针对REDD+的高水准目标。早期降低森林砍伐率的目标（在2020年降至50%，到2030年明显制止这一行为），以及提供资金援助的目标（150至250亿欧元）也均被剔除。

实际承诺的金额远远少于200亿美元——这是在2015年前减少15%的森林砍伐所必需的金額。会议没有明确达成私人融资机制，体制安排也有待解决。

保护生物多样性以及控制将天然林改变为人工林的主要措施从协定的实施部分转移到了不具约束力的序言部分

要求资源消耗国家解决他们推动森林砍伐的文字也被放入了序言部分。

对于地方推行REDD+计划，我们有一点担忧，那就是国家漏洞，指的是促使温室气体排放的行为仅仅是从一个地方转移到了国内的另一个区域。国家审计可以在国家层面解决漏洞的问题，但必需要求森林拥有国家显著提高自身的监测和报告水平。

推迟签署具有法律约束力的文件意味将有更多的森林被砍伐和退化。

Good News

Countries from both “developed” and “developing” world are developing low-carbon economic plans, and accepted a need for verification. Countries are asked to spell out by 1 Feb 2010 their pledges for curbing carbon emissions by 2020. Pledges on mitigation measures seeking international support will be recorded. Pledges of rich countries will be scrutinised under UNFCCC. “Developing” countries will submit national reports on their emissions pledges.

The Accord included the decision to establish a mechanism to enhance technology development and transfer to “developing” countries.

Even critics of the Accord noted it was so vague it could only improve in the coming months.

Implementation will be reviewed in 2015.

The Accord recognises the crucial role of reducing emission from deforestation and forest degradation (REDD) and the need to enhance removal of greenhouse gases by forests. It also agrees on the need to incentivise such actions through a “REDD+” mechanism, to mobilise money from developed countries. The COP agreed key methodological guidance for REDD+ activities.

20% of the proposed \$10 billion of fast-track funding will be allocated to REDD+ activities. Australia, France, Japan, Norway, the UK and the USA pledged US\$3.5 billion towards cutting deforestation in poor countries.

There are safeguards and principles relating to biological diversity and ecosystem services and against converting natural forests to plantations.

Developing-countries are asked to identify drivers of deforestation and forest degradation that result in emissions, and means to address them. They will also identify activities that result in reduced emissions, increased removals, and stabilization of forest carbon stocks.

Developing countries are asked to establish robust and transparent national forest monitoring systems, and sub-national systems if appropriate.

The preliminary nature of the agreement does allow further discussion that allows negotiators to reduce the risk of incentives to convert natural forest to plantation.

Bad News

The Accord does not require transparent reporting by rich countries on emissions, particularly on land use accounting. This could seriously undermine any legally binding emission reduction targets they set. There is no verification of the actions undertaken in the “developing” world unless they are paid for by the “developed” world.

Experts who had been working on technology transfer were frustrated at the lack of a binding outcome.

Many climate scientists believe the world is on course for a catastrophic 5-8°C flip in temperature regardless of currently-proposed mitigation efforts.

By 2015 it will be too late to adopt a new, lower target on global average temperature, such as 1.5°C.

No legally binding way was agreed to drive forward progress on REDD+. The draft decision lacked a high level objective for REDD+. Earlier targets to reduce rates of deforestation (50% by 2020, and to halt gross deforestation by 2030), and targets to provide finance (€15-25 billion), were all removed.

The amount committed is far less than the ~\$20 billion thought necessary to curb deforestation 15% by 2015. No private-sector financing mechanisms were explicitly agreed, and institutional arrangements remained unresolved.

Key safeguards to protect biodiversity, and limit forest conversion to plantations, were moved from the operative section of the agreement to a non-binding preamble.

The text obliging consumer countries to address their role in driving deforestation has been relegated to the preamble.

A concern for the sub-national implementation of REDD+ is national leakage, whereby activities that drive emissions are simply displaced to another area within a country. National accounting could address leakage at the national level but would require significant improvements in monitoring and reporting capabilities in many forest-owning nations.

The delay in a binding agreement means more deforestation and forest degradation.

提升海南农村复原力的案例

Building resilience in rural Hainan

撰文：乐小山、费乐思（香港嘉道理农场暨植物园）
Written by Hill Padilla and John Fellowes (KFBG)

现今，世界各地不得不面对着自然资源减少，气候变化日益剧烈以及经济的持续不稳定等问题。这些问题交织在一起，令我们对社区发展的重点提出了极大的疑问。面对不确定的情况，社区不能纯粹依靠累积金钱来确保其福祉，而应着眼于培养全面的自我修复能力。那么，在华南，自我修复能力强的农村社区应该是什么样的呢？

这几年来，嘉道理农场暨植物园（KFBG）一直在与海南中部鹦哥岭自然保护区内和周边的社区合作。该保护区拥有华南最大面积的连片热带雨林。我们在当地的首要工作，是和保护区管理局一起合作，有效保护热带雨林。当我们和社区打交道时，我们牢记生物多样性公约的原则：保护，可持续利用和公平享有生物多样性带来的利益。我们希望确保社区能从现存的森林公平获得一些回报——毕竟因为他们没有破坏，这片林子才得以留存了下来。另一方面，我们希望他们会适当改变一些对生物多样性有威胁的行为，如：狩猎、伐木、还有毁林来种植橡胶树。我们期望将保护和当地的需要和利益结合起来，这样会有助于森林的保护、也是保护必不可少的内容。最先，我们在鹦哥岭高峰社区的道银村开展工作。这个村子是保护区内不多的村子之一，地理位置偏僻，受经济发展的冲击比较小，对我们来说，既是挑战，也是机遇。

公平分享利益

有充分理论依据支持生态补偿：即：远离保护区外居住的人口得到森林生态系统的服务，如：水，气候调节和许多其它方面的好处，住在森林里和旁边的人由于发展受限应该受到补偿。但是，事实上，这种机制还尚未确立。那么，周边居民此时又可以获得什么好处呢？他们中有些人，有机会为自然保护区工作而获得经济收益，但大多数人没有这样的机会。我们能怎样帮助他们呢？

许多社区发展项目不成功，很大程度上，是因为他们给社区强加“解决方案”。这些“解决办法”要么不受欢迎，要么违背生态规律或是匆匆上马，没有给足够的时间培养社区群众成为项目的主人翁。我们一直试图避免犯同样的错误。我们的工作方式是，首先慢慢地建立起和居民的互信，了解他们的需求，然后提出一些实际想法，让他们自己决定选哪些来实践。“永续农耕”给我们提供了不少灵感，它所倡导的一些内容，已在各地有很好的实践基础，但都必须调整以适应当地情况。

第一步骤 ——引进循环系统

在我们建议了一些可能实行的项目以后，道银的新朋友们对其中两个产生了兴趣。两个项目都兼具改善卫生条件、解决肥料短缺和控制污染等多重效益。第一个是给村民们建造一个堆肥厕所——这也是道银村的第一个厕所。另外是深床猪圈。原先，村里的猪不是自由放养，就是圈在用混凝土倒的或者是木条搭的地板上。用深床猪圈养猪这种新方法，对猪自由觅食会有限制，但我们可以用高蛋白质饲料作物，来补充原先低蛋白的饮食，比如，给猪喂饲已经在海南落地生根的南美柱花草（我们不愿意引进新的外来种）。我们给村民放了一部用这种方法养猪的影片，让村民猜测片中猪的实际年龄。看着片中猪的个体大小，村民们估的答案比猪的实际年纪大得多。这么一来，我们的新朋友信服了，觉得可以试一下。

我们只是给他们提供了一点帮助，动员起来了的村民就很快把厕所和猪圈盖了起来，并且开始试用。两个项目都见效很快。村民们习惯用柴火做饭，堆肥厕所有效地利用了薪柴烧过后留下的草木灰，这比从老远引水冲厕不知要方便多少。不久，卫生堆肥厕所的设计就受到了乡亲的欢迎。猪儿们也对天然的稻草垫及营养丰富的饮食心满意足，不仅生长得快，也更加健



Throughout the world today, the combination of declining natural resources, dangerous climate change and an unstable economy raise serious questions about priorities in community development. In the face of uncertainty, a community cannot secure its wellbeing purely by accumulating money but should instead focus on building its all-round resilience. So what makes a resilient community in South China?

For several years, Kadoorie Farm & Botanic Garden (KFBG) has been working with communities in and around the great forest of Yinggeling in central Hainan. Along with our partners at Yinggeling Nature Reserve, our priority has been effective forest conservation. When we approached local communities we bore in mind the principles of the Convention on Biological Diversity: conservation, sustainable use and the fair sharing of benefits from biodiversity. We wanted to ensure the resident communities get fair benefits from the presence of the forest – which survives, after all, because they have not destroyed it. In return we hoped they would modify those aspects of their behaviour that threaten biodiversity, such as hunting, logging, and forest clearance to plant rubber trees. We expected integrating conservation with local needs and interests to be helpful, if not essential, to protecting the forest. We began with the community of Daoyin, in Gaofeng Administrative Village, whose intimacy with the forest, and relative isolation from commerce, raised challenges and opportunities.

Fair gains

There is a strong case that the ecosystem services derived by outside populations from natural forests – water, climate regulation and many others – merit compensation to those living alongside these forests. But in practice such mechanisms have generally not yet been developed. So what benefits could residents obtain in the meantime? Some had the direct economic benefit of working for the nature reserve, but most did not. How could we help them?

Many community development projects fail because they impose ‘solutions’ on communities that are either unwelcome,

ecologically inappropriate or rushed through without proper ownership. We tried to avoid these pitfalls by going slowly, building trust with the residents and presenting a range of practical ideas that allowed them to determine what was attempted locally. A source of inspiration was the approaches under the label “permaculture.” Some such approaches have been well tried and tested elsewhere, but all must be adapted to the local situation.

First steps – introducing cyclic systems

After raising a number of possibilities, two were of initial interest to our new friends at Daoyin. Both would bring multiple gains, in sanitation, fertilisation and pollution control. One was construction of a compost toilet for people – the first toilet in the village. The other was a deep-litter pen for the pigs, which either ranged freely or were kept in pens with concrete or slatted floors. While penned pigs have their foraging options curtailed, their low-protein diet can be supplemented with high-protein forage crops, like the naturalised South American plant *Stylosanthes guianensis* (we did not want to bring in new exotic species). We showed a film of pigs brought up under the regime and asked the Daoyin villagers to guess the age: based on their larger size the pigs looked much older than they were, and our friends were convinced it was worth a try.

With a bit of help, willing residents easily made the structures and gave them a trial. The benefits were quick. Villagers cook with wood and the dry compost toilet makes efficient use of the wood ash – much more convenient than hauling water for a flushing toilet. The hygienic design soon became popular in the neighbourhood. Meanwhile the pigs, contented on a natural straw substrate and richer diet, grew faster and healthier; to date another five such pig pens have been built in the village. Both systems allowed occasional harvesting of compost and use of the captured nutrients on fields, becoming a low-labour part of the waste management system of the community. The forage crop has also become important to them; several villagers have now planted *Stylosanthes* on unused land, and one even bought a machine-powered chopper to cut it.

康。迄今为止，村里又另建了五个这样的猪圈。厕所和猪圈这两个系统都可以时不时收集堆肥，把营养素返回农地，是社区低人力投入、废物管理系统的一个部份。对村民而言，饲料作物也日显重要；有好几个村民已经在不用的荒地上种上了柱花草。有一个村民，更自购了一台碎草机来处理饲料。

试验综合农业生态系统

在开展农业种植时，考虑植物蛋白含量这个做法，很快被村民理解和运用了。不过，我们的下一个建议更具争议性。我们希望他们尝试在橡胶林里种饲料作物。村民们担心：其它作物会不会和橡胶树争养份呢？我们的回答是：会！但我们认为，种植豆科作物可以固氮，从而增加土壤肥力；另外植被对防止水土流失的作用，足以抵消因竞争所产生的损失；林下套种也可以阻止除草剂的使用。到目前为止，两个村民在我们的说服下，采用了这种种植方法并实验了两年，橡胶长势确实较不间种要好。开了个好头，我们都等着看是否有更多村民会尝试。

我们还尝试了“永续农耕”的另一种技术：“稻鸭共育”。稻米是海南山区人民的主食中较传统的一种。海南人种植山栏稻，也种植水稻。两种稻都受虫害之扰，比如：叶蝉类引起的飞烧。稻田养鸭是不是能提供除虫、除草，施肥和增加土壤的含氧量等多重好处？实验结果证明是可行的，而且该技术已迅速传到其它村庄。这项技术的关键是鸭子，鸭子在完成稻田里的使命后，还可丰富节日的餐桌，成为另一道美食。

另一个受欢迎的项目是“自家小菜园”。由于道银地处偏远，要吃菜的话不是就地采摘一些野菜，就要到很远的地方去买回来。因此，保护区的工作人员建议村民种植蔬菜，提倡丰富种植品种，但控制种植量，这样就能做到一年四季，蔬菜自给自足、常吃常有（此种模式在国外又称作：*FAITH*，食物常备家中的意思）。

最近，为提高粮食产量，我们正在实践水稻“覆膜”技术，即：在水稻田上覆盖一层塑料薄膜，来保持土壤温度和生物活性，加快水稻生长。在营养物质充足的情况下，使用这种方法可以使系统更有效率。四川省农业科学院的吕世华教授已通过实验证明水稻“覆膜”技术，能更有效地提高肥料使用效果。“覆膜”可防止杂草，从而减少除草劳动，还保持水分，减少灌溉需要。受到其它地方成功经验的鼓舞，部份道银村民，在自己的山栏稻田和水稻田里，开始实验这种技术，稻米的长势和产出都有颇显著的改进。这一来，不少邻近村落的村民都跑到道银参观学习。最近，南开乡



政府也开始尝试这个项目。但该项技术也有它的不足之处，需要特别谨慎处理用过的塑料膜，提防塑料污染问题。

保护益人—少投入，高产出

上述我们提到的农业技术，和保护的关系不那么直接-我们做的，是提高他们土地的产量，从而降低他们对毁林开荒的需求。我们在当地推行的另一项创新项目和保护直接相关。在华南地区，溪流鱼种群不断下降。溪流鱼类是自然生态系统给我们提供巨大的、但还没有被量化的服务。有一段时间，我们想说服当地社区设立禁渔区，以达到恢复鱼类种群和增加禁渔区外渔获双赢的目的。原先，我们以为需要大量游说工作，才能让当地社区响应，因为，要让他们理解通过少捕鱼来增加渔获看似很困难，但实际情况证明，我们想错了。我们和保护区的工作人员讨论了几次后，然后和村民提出了我们的想法。没想到，2008年初，在我们还没有来得及做鱼类基础数据调查之前，鹦哥岭的工作人员就说服了道银村民，开始尝试建立鱼类保护区！不过，虽然没有基础数据，但村民还是可以自己判断鱼的大小和数量正在增加。两个夏季之后，村民们告知我们，他们在禁渔区外捕到了比以往更多而且大的鱼。现在，自然保护区内和周边，已有7个村庄，陆续设立了禁渔区。我们在其中两个村庄的禁渔区，重新放归了海南特有的海南墨头鱼(*Garra hainanensis*)，这种鱼在海南的大多数河流已经绝迹。

对于那些依赖自然资源为生的人来说，保护和可持续利用是有重迭并且有激励作用的。经过讨论，我们鼓励高峰社区的5个自然村，形成社区保护协调委员会。委员会已经领导5个村，制定了乡规民约，规范采藤和野生蜂蜜收集。保护区觉得协调委员会是一个将社区利益和有效保护紧密联系起来的重要平台。

上述这些活动都具有很好的宣传教育价值，这是我們很看重的。大部分活动都获得当地媒体的报导，引起了公众关注，让村民对他们所做感到自豪。

Experimenting with integrated agro-ecosystems

The idea of applying knowledge of the protein value of local plants soon caught on. Still, our next suggestion was more controversial; we wanted them to try intercropping forage crops along the contours of their precious rubber plantations. Wouldn't other crops take important nutrients from the rubber? Yes, but we thought nitrogen fixation by leguminous crops, and the role of the vegetation in intercepting soil runoff, would outweigh this loss. Crops under rubber would also deter the use of herbicides. So far only two farmers have been persuaded to try this – and have noticed improved rubber growth after two years. We await to see if uptake will increase after the promising start.

Another permaculture element on trial is the duck-rice system. Rice is the other, more traditional, staple for Hainan's hill people; they grow both paddy and *shanlan* or hill rice. Both types of rice get pest problems, such as hopperburn from planthopper bugs. Would ducks provide multiple benefits, of controlling pests and weeds, fertilising the fields, and aerating the soil? We tried, and the results proved popular – the technique has quickly spread to other villages. The clinching motivator is the ducks themselves, which are ready to be consumed in time for local festivals.

Another popular project is the kitchen garden. As Daoyin is a very remote place, plants must either be locally harvested or brought in a long way. The nature reserve staff have therefore encouraged the villagers to increase food diversity by planting more varieties but in smaller quantities, and making “food always available in the home” (FAITH).

A more recent experiment to improve rice productivity is the “plastic mulch” technique – a layer of plastic sheeting on the paddy can keep soil warmer and more biologically active, speeding up rice growth. Assuming there is plenty of nutrient, this can make the system more productive. Experiments by Prof. Lu Shihua, of Sichuan Academy of Agricultural Science & Technology, show it results in more efficient fertilizer use. The plastic mulch prevents weeds and thus reduces weeding labour; it also ensures moisture availability and reduces the need for irrigation. Encouraged by other successes some farmers tried this in their own fields, both for upland and lowland rice, and the improvements in growth and eventually



harvest were quite dramatic. This has prompted neighbouring villages to visit Daoyin and take note. The local township government of Nankai has recently started to try it. The main drawback of the technology is the pollution effect of the plastic if not handled properly – something for attention.

Conservation for people – having more with less

For these techniques the conservation gains were indirect – we were helping residents use their land more productively, thus reduce the demand to clear new land. Another innovation we wanted to promote was more directly related to conservation. Throughout South China we have observed declining stocks of stream fish, an immense, but largely unquantified, provisioning service from natural ecosystems. For some time we had wanted to persuade a local community to try the experiment of a no-catch zone, to achieve the double win of recovering fish populations and increased catch outside the zone. We expected this to require a lot of persuasion – it might be counterintuitive to catch more fish by catching less. But we were wrong. Having discussed this just a few times with the reserve staff and raised it with villagers, in early 2008 Yinggeling staff easily persuaded Daoyin to try it out, and they immediately established a fish sanctuary – before, in fact, we'd had time to do a baseline survey to measure its impact! Still, the villagers themselves can judge whether the size and number of fish is increasing. So far, two summers later, residents report a bigger catch outside the sanctuary, and bigger fish. Indeed fish no-catch zones have spread to seven other villages in the nature reserves. In two villages sanctuary establishment was even combined with the release of an endemic fish (*Garra hainanensis*) extirpated in most local rivers.

For people traditionally dependent on harvesting resources, there is a similar overlap in incentives for conservation and sustainable use. After some discussion we were able to encourage the five villages of the Gaofeng area to form a Community Conservation Committee. This has already formulated village rules and regulations for sustainable harvesting of rattan and wild honey. The nature reserve sees the committee as a key forum for tighter links between community benefits and improved conservation.

Of paramount importance in all these activities is the educational value. Most have been covered in the local media, which raised attention from the public and made the villagers proud of what they are doing.

Our next focus at Daoyin is to help the villagers find building materials that do not require a lot of cash – or natural resources at a rate that cannot be renewed. From techniques developed at Auroville in India, Yinggeling Nature Reserve and KFBG are currently building a community centre using stabilized earth – this requires just one-eighth the energy consumption of fired brick. At the time of writing, construction is midway through. Skilled forest wardens from other villagers volunteered to work in the construction and one significant result is learning and exchange among the volunteers and the villagers.

* 所有照片均由作者提供。
All photos are credited to Hill Padilla/ KFBG.

我们在道银的下一个工作重点，是帮助村民寻找合适的建筑物料，不必再花钱出外购买，或者过量使用自然资源使其不可再生。鹦哥岭自然保护区和嘉道理农场暨植物园，运用从印度奥罗维尔学到的新建筑技术——改良夯土法，在道银建造一座社区中心。夯土技术造屋所消耗的能源，是烧砖所需的八分之一。在撰写本文时，道银社区中心已经建成了一半。一些在其他村子懂起屋盖房的护林员自愿参加了社区中心的建造。这项工作最重要的产出，是创造了护林员志愿者和村民之间互相学习和交流的机会。

推广

鉴于我们在高峰取得的初步成功，鹦哥岭自然保护区和嘉道理农场暨植物园，已获邀在白沙县的元门乡和南开乡，做一些较大型的可持续农业示范项目。我们还计划在自然保护区南坡，推广一些有针对性的社区项目。两个机构已经联合制定了衡量示范项目有效性的一些准则：

- 示范项目必须有针对性，处理可持续生活所面对的威胁。目前由元门乡政府提出的待解决问题包括：土壤肥力和作物产量下降（比如：甘蔗，橡胶等），水质污染（来自于除草剂，化肥，橡胶加工）和废物处理问题（农村没有垃圾处理系统）。自然保护区觉得尚待解决的问题，主要是由于围垦，砍伐和狩猎引起的森林退化。
- 示范项目需令参与村民维持（最好是提高）节省开支的能力。这跟增加收入不一样，虽然很多时有同样效果！
- 示范项目应该保障（最好提高）粮食充足。比如：使得参与者对市场的波动和气候的变化有更高的承受力。
- 示范项目需要保持（最好是恢复）自然资本——包括生态系统服务功能。实践的技术应该能改善生物生产能力，以及适应气候变化。
- 示范项目需要控制（最好是降低）污染。
- 示范项目需要控制（最好是减少）能源投入。
- 示范项目需使用简单实用、利用本地资源的技术。
- 示范项目应该有很大机会被当地部门采纳和推广。最理想的准则，是项目见效快、操作相对容易。

加强信任 重建复原力

和当地社区的紧密合作，使我们更尊敬当地社区，并对其所处情况更了解。虽然，我们是一个自然保护区机构，但对全球趋势的认识，使得我们也在社区方面开展工作，帮助提高社区的自我复原力。

所幸，两个目标大体是一致的。增加对气候变化和石油危机的应对能力，需要维护和恢复生态系统的服务功能，无论是提供产品，如：水，鱼，藤，草药和蜂蜜；还是调节气候和控制病虫害，抑或辅助功能如：形成土壤，甚至还有保持群山优美的文化服务的功能。

在廉价石油时代，传统思维是不计投入、最大限度地提高生产力和令收入最大化。收入是一个有意义的数

据，因为它反映了你竞争资源的能力，但这种想法，却对财富所依赖的自然资本忽略不计，并错误的将幸福与收入挂钩。

具有自我复原力需要多样性和生产力，因为单一作物，非常容易受到虫害或气候变化的影响，不能作为收入的保证；另一方面，具有自我修复力要求减少对能源，种子，化肥和农药的投入。在廉价石油时代，农村社区可能已通过令收入最大化而为城市化做好准备，但他们可能越来越发觉自然资产才能给他们提供安全。自我复原力亦要求社区要有凝聚力，并且团结合作，认识到你最亲密的盟友，就是那些和你处境类似的人。在这一点上（还有其它许多方面），居住在偏远林区的社区，比居住在大城市的人要有优势。

今天，我们需要和传统思想更合拍的前瞻性思维：改善自然资产和优化生产力。在经济崩溃时，钱可以变得一文不值，但自然资本却是至关重要的。

在高峰社区，人类活动与生物多样性保护的冲突还是有很多。但是，我们已取得的经验告诉我们：自然保育与提高社区的自我复原能力有许多共通之处。当社区开始关爱他们的自然资本的时候，全球体系的混乱变得不那么令人让人忧心。尽管如此，我们在廉价石油时代所养成的态度还是需要改变。

在此，特别感谢道银村民，以及鹦哥岭自然保护区的工作人员，还有本园在大陆工作的同事：特别是王云鹏和卢刚。他们二位对工作充满热情和执着，是上述项目的主要推动力。

参考《森林脉搏》第九期
See Living Forests 9:
<http://www.kfbglivingforests.org/content/issue9/index.php>
<http://www.ncp.org.ph/index.php/Food-Always-in-the-Home-FAITH.html>



Scaling up

These initial successes in Gaofeng have led to Yinggeling and KFBG being invited to do larger-scale demonstrations of sustainable agriculture, in Yuanmen and Nankai Townships of Baisha County. We also plan to work around the southern margin of the nature reserve. The Yinggeling-KFBG team agreed some criteria of an effective demonstration:

- It **addresses recognised threats to sustainable living**. Threats currently recognised by the Yuanmen government include declining soil fertility and crop yields (sugarcane, rubber etc.), water pollution (from herbicides, fertilizers and rubber processing) and the waste disposal problem (no waste system in villages). Those recognised by the nature reserve include forest degradation through encroachment, logging and hunting.
- It **maintains (and preferably improves) the ability of practitioners to save money**. This is often, but not always, the same as earning more!
- It **maintains (and preferably improves) food security**. For example it makes practitioners less vulnerable to market and climate fluctuations.
- It **conserves (and preferably restores) ecological assets** – including ecosystem services. The system should improve the biological capacity for production, and the resilience of the system to climate change.
- It **curbs (and preferably reduces) pollution**.
- It **curbs (and preferably reduces) energy input**.
- It **uses simple and practicable techniques based on local resources**.
- It **has a good chance of uptake and promotion** by agencies active in the region. A desirable criterion in this was that it delivers benefits easily and quickly.



Building respect, rebuilding resilience

One result of our work with local communities has been a deepening respect and empathy for their position. Whilst always conscious of the conservation priorities, awareness of global trends leads us to recommend interventions that boost their resilience.

Fortunately the two considerations are largely aligned. Resilience calls for safeguarding and restoring ecosystem services, whether they are provisioning services like water, fish, rattan, herbal medicine and honey supplies, regulating services like climate and pest control, supporting services like soil creation, or cultural services like keeping the hillsides beautiful.

Conventional thinking in the cheap-oil era has been to maximise productivity regardless of inputs and maximise financial earnings. Income was a meaningful measure because it reflected your ability to compete for resources. But this thinking has disregarded the natural capital on which wealth was based, and assumed wellbeing was related to income.

Resilience calls for diversity as well as productivity: a single crop is no guarantee of income, and highly vulnerable to pests or climate changes. It calls for reducing the need for inputs of energy, seeds, fertilizers and pesticides. Whereas rural communities in the cheap-oil era might have maximised revenue to prepare themselves for urbanisation, they may increasingly find security from their natural assets. Resilience, too, is about community cohesion and cooperation; recognising that your closest allies are those in a similar position. In this as in many other respects, communities in remote forest areas have some advantages over those in large cities.

Today we need forward thinking which is more in tune with traditional thinking: improve natural assets and optimise productivity. Money could become worthless in an economic crash, but natural capital will be vital.

There remain plenty of conflicts at Gaofeng between human activity and biodiversity conservation. But our early experience convinces us that conservation has a lot in common with building community resilience. As communities nurture their natural capital, disruptions in the global system become less alarming. Still, attitudes acquired in the cheap-oil era will take some changing.

We thank the people of Daoyin, and our colleagues at Yinggeling Nature Reserve and KFBG – especially Wang Yunpeng and Lu Gang – for their enthusiasm and drive in pioneering the projects described here.

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“转化” 培训给一个大陆民间人士的感受

Transition training and me,
a civilian from the mainland

撰文：曾世逸

Written by Zeng Shiyi, dajiakm@yahoo.com.cn



作者简介：曾世逸，1978年生于湖南农村，读中专、入国企、再读研，最后投入公益领域而出不来。2006年后发起创办昆明真善美文化传播中心、北斗星志愿文化传播中心及“本土食尚”志愿服务小组，致力于邀请知名学者到云南等地高校、党政机关讲学，推动本地化、经常化的学术交流、经典研读和下乡实践、志愿服务，越来越关注生态农业和永续生活，2009年3月参加嘉道理农场暨植物园主办的这次“转化培训工作坊”。

一、如何应对气候变化和石油顶峰？

这是“转化” (Transition) 培训主办方——香港嘉道理农场暨植物园提的问题。我既纳闷又期待：气候变暖万众瞩目却日益严峻，各国政要为二氧化碳减排谈判得焦头烂额却进展甚微；石油资源日益稀缺，各国争夺激烈，以至《石油战争》成了畅销书。如此重大问题，我等一介草民、区区NGO，甚至一个城市，能有什么办法？

参加培训才知道，问题比我知道和想象的严重得多。为了避免气候变化带来的大灾难，必须把温度上升控制在2度以内，把二氧化碳浓度控制在445ppm以下，而这只比2006年的381ppm高64ppm，令人恐惧的是过去100年间二氧化碳浓度的上升超过60ppm，并且呈现加速趋势。

石油顶峰也即将到来。无论单个的油井、油田，还是重要产油国的产量或新发现的储藏量，都已达到或超过顶峰。这一问题在最近五年持续加剧，而替代能源刚刚起步，现今再生能源产量即使超乎想象地翻上

两番也只相当于我们耗油量的3%。所以，“廉价石油”即将成为过去，建基于石油的现今生活水平、生活方式、生产方式包括产业结构也将被迫全面调整。

一个难题已让我们束手无策，更令人忧心的是“1+1>2”！当石油峰值遇上气候变暖这个“天花板”，资源问题加上环境问题，头痛医头、脚痛医脚已不能解决问题，唯有全面“转化”！从生产到生活，从个人到社会，从一城、一国到全球，都必须全面“转化”！我等草民、草根也匹夫有责！这就是“转化”培训带给我的启示。

二、中国与西方：用对话合作代替质疑责难

在随后一次公众参与的“转化”对话中，来自中国大陆的我感受到了压力：几位外国朋友多次关切地谈到中国，并担心中国已给世界造成巨大的压力，但中国人还不知道问题的严重性……

通过主持人的许可和翻译，我就个人所知作了发言，大意如下：

中国的人均能耗及“生态足印”相对较低，仅相当于1/6个欧洲人、1/12个美国人的水平。中国的大多数数人，特别是农村居民，生活水平不高，资源消耗

About the author: Zeng Shiyi was born in 1978 in rural Hunan, China. He worked in a national enterprise after graduating from vocational training, then went back to study again, entered community service afterwards and was “trapped” there. In 2006, he founded the Zbenshanmei (literally: truth, goodness and beauty) Cultural Centre in Kunming, the Beidouxing (literally the Big Dipper or the polestar) Volunteering Promotion Centre and the “Local Deli” Volunteer Service Group. He’s committed to promoting localised and regular academic exchange by inviting scholars to deliver talks at tertiary schools and organisations of the party and government in Yunnan, and dedicated to promoting reading of classics, practising rural living and volunteering. He has also felt a growing interest in ecological farming and sustainable living issues. He joined the Training for Transition workshop in March 2009 organised by Kadoorie Farm & Botanic Garden.

Part One.

Transition: in response to Peak Oil and Climate Change

This was the question posed by Kadoorie Farm & Botanic Garden (KFBG), the organizer of the first Transition Training in Hong Kong. I wanted to know the answer: global warming was in the headlines and worsening; countries debated fiercely over carbon dioxide emission cuts but without much progress; oil was depleting and nations were fighting for it, and “A Century of War” became a bestseller. Facing a problem so huge, I wondered what can a layman, an NGO or even a city do.

The training showed me things were worse than I’d anticipated. To avoid catastrophic climate change we must keep the temperature increase below 2 degrees, and concentration of carbon dioxide below 445 parts per million (ppm) in the atmosphere. That’s only 64 ppm above the 2006 level of 381 ppm. What’s worrying is that atmospheric carbon dioxide has risen over 60 ppm in last decade, and the trend is accelerating. (Most scientists now agree a greenhouse-gas concentration below 350 ppm is needed to stop catastrophic climate change: see www.350.org/understanding-350#2)

Peak oil is approaching too. Whether it is the output of a single well, of an oil field, of major oil-producing countries or the volume of new reserves discovered, all figures have reached or passed their peaks. The problem has worsened in the last five years. With today’s alternative energy still immature, even if the output of renewables could be quadrupled, it would substitute only 3% of our oil consumption. So the age of “cheap oil” will soon become history, and the associated standards and ways of living, mode of production and industrial structure will all be forced into a complete overhaul.

Peak oil is disturbing. When it meets the “ceiling” of global warming, the situation becomes worrying as “1+1>2”! Facing both resource and environmental limitations, stop-gap measures are no longer enough. The only solution is a total “Transition”! That is “Transition” in everything, from production to daily life, from individuals to society, from a city or a country to the globe as a whole. We grassroots and laymen are also responsible! This is what the Transition Training brought home to me.

Part Two.

China and the West: dialogue and co-operation, not questioning or blaming

Later, during a public dialogue on “Transition”, I felt the tension as a member from Mainland China: several foreign friends expressed concern about China and its huge pressure on the world, and felt the Chinese are not aware of the seriousness……

With permission and translation help from the hosts, I made a statement according to what I know, roughly:

China is relatively low in per capita energy consumption and “ecological footprint”, which is only about one-sixth that of a European or one-twelfth that of an American. Most people in China, especially rural dwellers, live simply and consume few resources. Therefore, when blaming China for “troubles”, there should be more reflection on the European and American ways of live. Moreover, the problem lies not in which country you’re in, but which “class”. Those who overload the earth are people who live in luxury and overspend (no matter whether they are European, American or Chinese)!

And China isn’t unaware of the seriousness. China has translated plenty of foreign literature. “The Limits to



很少。所以，指责中国带来“麻烦”时，更应反思欧美的生产生活方式。进一步说，主要不是国别问题，而是“阶级”问题，给地球带来太大负担的是那些奢侈、过度消费的人（无论欧美的，还是中国的）！

另外，中国人不是不知道问题的严重性。中国翻译出版了大量国外书籍，《增长的极限》1980年代就已流行大陆，1990年代我的同学就跟我们分享《熵——一种新的世界观》。官方文件、报纸和教科书里都有环境保护、可持续发展方面的内容，资源、环境、人口问题已引起广泛关注，中国环保NGO数量众多并有较大影响。

百年来的“西学东渐”深深影响了中国，改革开放更是国门大开、全面学习西方。问题不是中国不懂西方，而是中国重蹈西方复辙。西方的主流是“现代化”，中国的主流是学习西方，因此西方“现代化”主导的中国，在快速“现代化”过程中也造成严重得令世人担忧的“现代性”问题。所以出路在于：要么改变西方这个“中国的老师”，要么中国不要再当“西方的学生”。总之，“现代化”是主流，这是世界性的问题，中西同构。“转化”也是全球性的，而关键在西方这个全球化的主导者。

其实，被“现代化”所否定的中国传统恰恰是生态的、可持续的，比如天人合一、重农抑商、自给自足、勤俭节约等。这些传统在中国的农村特别是西部、少数民族村庄至今仍有影响，令人担忧的是西部在学东部、农村在学城市，本土传统没有自信自觉，“现代化”仍在持续深入。尽管社区伙伴等机构致力于本土传统的保护和倡导，但人们更多被现代化、城市化这些主流的东西所吸引和影响，这才是更危险的。

现在想来，当时我的发言更多是民族自尊心受到伤害而作的辩护。中国现今问题的严重性，特别是其危险的发展趋势和未来前景，自然会让外国朋友担忧，也让国人扼腕。

令人感动的是，两位来自英国的“转化”培训师特别指出能源采用上的不平等现象：1美国人=2欧洲人=13中国人，而且中国生产外销西方商品的耗能量占到中国总能耗的四到六成。他们追问：若十亿中国人的耗能量及生态足印比三亿美国人还要低，问题究竟出在何方？

英国培训师让我更加坚信：不要相互指责“麻烦制造者”，而是自我反思、合作对话，携手推进“转化”工作。

三、倡导与践行：启动大陆转化工作

培训期间充满激情和自信，冲动地酝酿着怎么开展转化工作。但回到昆明之后，豪情、信心和计划又被日常事务挤压到角落去了。每每想起，顿生自责和无奈。半年过去了，行动仍未开始，但思考并未终止，激情和计划也在新生。

尽管转化主要是因应气候变化和石油顶峰这两大严峻挑战而提出和推广，也应该以减少我们对石油燃料的依赖和减轻气候变化对我们的影响为重点目标，但我认为转化不只限于环境、资源领域，也不同于一般的环保工作，而应该是针对整个人类的生产、生活方式及观念，从不可持续到可持续的全面的转化，是全球经济、社会、政治、文化及人们身心灵、工作生活、思想行动的全面转化，否则“转化”既不可能也不可欲。

尽管目前世界的转化主要旨在催化三块内容的反思和行动：有计划的本地化（Planned relocalisation）、减少能源使用（Energy Descent Pathway）以及加强地方复原能力（Local Resilience），但我认为在尚未真正启动转化工作的大陆，目前主要应该着眼于两个方面：一是进行社会倡导以让更多人了解和认同转化，二是一部分人率先行动起来，践行一种简单而可持续、有意思的新的生活方式。因为外部困境使转化更加紧迫和必要，但转化的动力来自人的内心，来自人对现有生活方式的反思及对身心幸福的追求，转化应该是从内心到外界、从思想到行动、从生活到生产、从城市到农村的递进过程。

尽管现代化、城市化、国际化、消费主义仍是中国大陆的主流价值，其全面转化在短时间内几乎不可能，但大陆之大，特别是“和谐社会”和“科学发展”等新提法让大陆的转化工作具有很大空间。目前，从事环保、生态农业、文化反思的NGO机构在成长，其中一些机构的工作在深化和拓展，逐步形成整全的健康理念，与“转化”理念越来越近（尽管他们不一定提出或接受“转化”的提法）。比如瀚海沙，已不再是单一的环保机构，不只是关注生态荒漠化，其工作已经延伸到社区支持农业（CSA）、文化反思及人文教育（心灵环保）等方面；推广土生品种及社区支持农业的柳州爱农会越来越重视整全、健康、合作等观念的传播；培育农村人才、推广农村合作及新乡村建设的梁漱溟乡村建设中心提出“新人”、“新文化”的理念并身体力行；特别值得一提的还有绿色生活馆——几个分别从事环境教育、传统文化保护、有机农耕的机构携手合作，在北京什刹海社区开展废物回收利用、社区历史整理、家庭有机种植等丰富多彩的

Growth” was already popular in the 1980s, and in the 1990s my classmates were already chatting about “Entropy: A New Worldview”. Topics of environmental protection and sustainable development are seen in official documents, newspapers and textbooks. Issues like resources, environment, and population arouse much attention. Also, environmental NGOs in China are numerous and have relatively big impact.

Last century’s “Learning from the West” deeply influenced China; and the more recent “Reform and Opening-up” meant wider acceptance of, and more thorough learning from, the West. The problem is not that China doesn’t know the West, but that China repeats the mistakes of the West. Modernisation, being the norm in the west, became the norm in China. And going through her fast-track development, a modernised China is also causing the world worrying modern problems. So, the solution: either the West, “teacher of China”, must change, or China must refrain from being a “student of the West”. That is to say for China and the West alike, the norm of “modernisation” is a world problem. As for Transition, the movement is also global and the key lies with the West, leader of globalisation.

In fact, quite a few Chinese traditions that “modernisation” dismissed are indeed ecological and sustainable, such as the unity of heaven and man, the encouragement of agriculture and discouragement of trade, self-sufficiency, hard work, thrift and so on. These traditions are still effective in rural China, especially in western China and in minority villages. However, western China is learning from eastern China, and rural areas from cities. Local traditions are losing confidence and self awareness, and “modernisation” is eating into them. There are organisations like Partnerships for Community Development (PCD) who work towards protecting and promoting local traditions. Yet it’s worrying that people are more attracted towards mainstream ideas of modernisation and urbanisation.

With hindsight, that statement by me was more of a defence for a hurt national pride. The problems China faces today, her hectic trend of development and perilous prospects - the seriousness of these problems are indeed worrying, to foreign friends and Chinese alike.

I felt touched when our two trainers from UK pointed out an unequal phenomenon of energy use: 1 American = 2 Europeans = 13 Chinese and that 40-60% of China’s energy consumption was used in manufacturing commodities for export to the West. They then asked, “When the energy consumption and ecological footprint of a billion Chinese is lower than that of 300 million Americans, where is the real problem?”

With these trainers I felt reassured that this is not a time for finger pointing at “trouble makers”, but for self reflection, dialogue, and joining hands and work towards Transition.

Part Three.

Advocacy and practice:

initiating Transition work in the Mainland

During the training I felt passionate and confident, and was restlessly thinking about how to launch Transition work. But back home in Kunming, all passion, confidence and plans were squeezed aside by daily routine. Sometimes Transition thoughts would pop up, though only to leave me with self blame and helplessness. Half a year passed, and although nothing is in practice yet, the thinking is ongoing, and passion and plans are redeveloping.

Transition was proposed and promoted in response to the two pressing challenges, namely climate change and peak oil, and its major aim should be to decrease our reliance on fossil fuels and minimise the effects of climate change on us. However, I think Transition is not limited to environmental and resource aspects, and is different from general environmental protection work. Transition should aim for changes in all aspects, from how we produce to how we live and think, from non-sustainable to sustainable. And the changes should cover all areas, including world economics, social, political, and cultural aspects. It should be a transition in people’s bodies, hearts and minds, from work to life, from thought to action. In short, it needs to be in all aspects; otherwise Transition will be impossible and undesirable.

The world Transition movement has put forth three major areas for reflection and action, namely Planned Relocalisation, an Energy Descent Pathway and Local Resilience. For Mainland China, where Transition is not yet active, I think at this point we should prioritise two tasks: one being social advocacy to gain wider understanding and acceptance; and the other to have a group of people to practise and show a new way of living that is simple, sustainable and meaningful. Although external difficulties add to the urgency and necessity of Transition, what drives it is the inner pursuit of well-being of body and mind and reflection on one’s current lifestyle. Transition should be a progressive progress, from inner heart to external world, from ideas to action, from ways of living to ways of producing, and from cities to rural areas.

In China, modernisation, urbanisation, internationalisation and consumerism are still mainstream, which means a total Transition in the near future seem hardly possible. Yet China, as big a country as she is, has, with new concepts like “harmonious society” and “scientific development”, huge potential for Transition work. At present, NGOs working on environmental protection, eco-agriculture, cultural reflection etc. are maturing. Some of them are going deeper and wider with their work, and gradually forming holistic health concepts which are getting closer to those of Transition (although they might not use the name, or even accept all the ideas, of Transition). One example is Han Hai Sha, which is no longer merely an organisation for environmental protection, or only focusing on desertification, but whose work is extending into areas of community supported agriculture (CSA), cultural reflection and humanity education (being environmental at heart), etc. Similarly the Farmer’s Friend Association of Liuzhou, which previously focused on promoting local agricultural species and CSA, is now putting more emphasis





活动。展望未来，环保、生态农业、文化反思等相关机构的工作和理念与转化最接近，或可成为转化工作的主力，但由于转化工作是个整全的系统工程，因此前提是这些相对专业和单一的机构首先“转化”他们自己，同时需要机构之间的协同合作，这并不是容易的事，更非一朝一夕可成——当然至少是可以期待又可推动的。大陆转化工作的先行者，应该是那些真正有全球视野和深层关怀，有理想主义精神又能践行简单生活，有坚强意志又有感召力、影响力的人。

鉴于主流观念之强大与问题、趋势之严重，我觉得慢慢吞吞、零敲碎打、各自为战或单兵作战的惯行 NGO 做法难以取得实际效果，转化工作应该讲究系统性、协同性，要有力度、速度和规模效应。具体而言，在毒奶粉、结石宝宝、三聚氰胺等恶性事件相继曝光的背景下，以食品安全、健康生活为突破口，推动生活、消费等方面观念及方式的转变。同时，加大对各种（而不是单一）严重社会问题及典型事件的宣传，加大对消费主义、物质主义的批判和反思，让更多人意识到现有的生产、生活方式不可持续，全面转化才是根本出路。在此基础上——也是更重要的，引导人们反思自身、付诸行动，鼓励一部分人率先践行简单、快乐、健康而可持续的新的生活方式（比如“半X半农”、家庭节能环保、家庭种植、中华武术、艺术欣赏与创作、志愿服务等），让更多人实实在在地看到或感受到新的生活方式是可能的，而且是有吸引力的。我计划采取以下方式：动员市民和大学生到农村去参观、体验和学习，推动大学生寒暑假返乡调查家乡的本土传统及民间智慧，开办转化小报、“内

部刊物”或通过大众媒体传播“转化”理念，举办转化工作坊及面向政府和公众的讲座与交流，倡导和践行“转化新生活”等等。

相关网站链接：
瀚海沙—环境与文化工作室：
<http://www.desert.org.cn/>
柳州爱农会（土生良品）：
<http://tuguan.bokee.com/>
梁漱溟乡村建设中心：
<http://www.3nong.org/>
绿色生活馆：
<http://greenlifecenter.blog.sohu.com/>

参考文献：
Meadows DH et al., 1972. *The Limits to Growth*. Universe Books.
Rifkin J and Howard T, 1980. *Entropy: A New World View*. The Viking Press, New York.

on promoting holistic, healthy and collaborative concepts. And Liang Shu Ming Rural Reconstruction Center which promotes farmer training, co-operatives and new rural construction, has now added the concept of “New Person”, “New Culture” and is living the philosophy. Also worth mentioning is the Green Life Center co-founded by several organisations from the fields of environmental education, traditional culture protection and organic farming respectively. They have jointly launched colourful activities like recycling, forming local history archives, home organic planting etc. in the Shichahai community in Beijing.

Looking to the future, organisations working on environmental protection, eco-agriculture and cultural reflection have concepts close to Transition, and could become major forces for Transition. However, Transition is a holistic systematic process, so these relatively professional and individual organisations must first put themselves into Transition, and collaborate with each other. This is no easy task, nor a quick one. But at least it is achievable and could be pushed forward. In the Mainland, Transition pioneers will be those with genuine and caring world view, who are idealistic yet could practice simple living, with strong will, inspiration and influence.

Considering the strength of the mainstream, and the seriousness of problems and development trends, I think any typical NGO action, in slow, piecemeal, isolated or one-man-show style, is unlikely to have a major impact. Transition work should be systematic, collective and should be launched with energy, at speed and at scale. In particular, after the unveiling of toxic milk powder, “stone babies”, melamines and other scandals, food safety and healthy living could be a good starting point to promote changes in ways of living and patterns of consumption. It is also a good time to increase public awareness of the range of (rather than single) serious social problems and events, and to step up criticism and

reflection regarding consumerism and materialism. Time to make more people aware that existing production styles and lifestyles are unsustainable, and the only way out is a total Transition. So what we should do now, and this is very important, is to guide people to self-reflect, take action, take the lead in simple, joyful, healthy and sustainable new ways of living (such as “half-X half-farming,” household energy saving for the environment, home-grown (food), Chinese martial arts, art appreciation and creation, voluntary services, etc.), so that more people could see and feel for themselves that the new ways of living are possible, and better, attractive. Here’s my plan: to organise rural visits for the public and students to experience and learn, to promote surveys by university students of traditions and folk wisdom when they return home for summer and winter vacations, to publicise transition concepts through newsletters, “internal publications” and the mass media, and to organise workshops as well as seminars and exchange forums for the government and the public, to advocate and practise a “Transitional new life”.

Related websites:
Han Hai Sha: <http://www.desert.org.cn/>
Farmer’s Friend Association, Liuzhou: <http://tuguan.bokee.com/>
Liang Shu Ming Rural Reconstruction Center: <http://www.3nong.org/>
Green Life Center: <http://greenlifecenter.blog.sohu.com/>

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Meadows DH et al., 1972. *The Limits to Growth*. Universe Books.
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社区支援农业志愿者

Community - supported agriculture volunteers

撰文：周晖、邓文婷 (社区伙伴)

Written by Frances Fai Chau, frances@pcd.org.hk and Sherman Tang, sherman@pcd.org.hk



社区支持农业项目的实习生在成都附近开心的从事着体力劳动。
CSA supporters happily labouring near Chengdu.

有一句话尝试为当前中国的城乡关系作注——“城市人为农村人造假，农村人为城市人下毒”，虽然有点戏谑的夸张，但反映的是在生产行为只是为了满足资本累积的今天，随着人们对增产、增收的无尽追求，品质和诚信已濒临破产的现实。而城乡看似二元的距离，但又是互为表里的依存着，摆在我们面前的，是如何为这种依存建立起良性的互动？

社区伙伴自2003年开始探索以“社区支援农业”带动城市和乡村正向发展的可能。也许对于城市人群来讲，最初的愿望是出于餐桌安全来支援那些本土生产的有机食品，但在不断地了解我们选择的食物和背后乡村生产者的故事及我们所处的生存环境后，继而希望打开的是反思城乡关系、城市生活方式、环境和消费模式，以及在现代化和全球市场化下对社区永续的发展的思考。

愈来愈多团体和个人在这方面表示关注，并付诸行动。社区伙伴在2006年开展了社区支援农业实习项目，鼓励青年人实践梦想。在活动中，他们能一面学习，一面反思；而主办机构和相关的社区，也能培育协作者和团队成员。我们也在实习期里提供小额资助，支援他们举办与社区支援农业相关的活动，最终触及城乡关系的议题，如城乡互动、生态破坏、农村生计等。而加强一个幅盖全国的社区支援农业网路更是项目的重点，那是实习生和主办机构互动和交流经验的平台，两者都能从中学习。

2005年，社区伙伴与嘉道理农场暨植物园合作，为社区支援农业网路提供技术支援，随后两年，于广西柳州和北京举办生态农业培训，其中柳州的爱农会、河北的晏阳初乡村建设学院（现国仁城乡（北京）科技发展中心）、梁漱溟乡村建设中心和成都的华德福学校对此项目热心支援。

爱农会于2005年底成立，以富有地方特色的“土生良品”餐厅为平台，为城市消费者提供地道美食之余，更积极推动农户种植本地传统品种的农作物，鼓励城市消费者和农民交流，成为城乡互助互信的桥梁，也促进农民与大自然间和谐关系。成都的华德福学校的课程核心包括了人与大自然的关系。除了社区为本的农业外，华德福学校致力建立生产者与消费者之间互信互助的关系。这里的实习生在图书馆辟了个有机农业的角落，鼓励健康生活方式和保护生态的消费。

实习生也把他们的学习和实践的成果记录下来，这些文章刊载在各参与机构出版的刊物，包括华德福学校历年的特刊、爱农会的地方小报《土生良品》及梁漱溟乡建中心的《新农村建设通讯》和社区伙伴出版的《比邻泥土香》等，希望透过这些纪录，把当中有益的实践经验传给更多的行动者，携手营造健康的土地、健康的食物和我们健康的生活。

社区伙伴

“社区伙伴”是一个社区发展组织，于2001年5月由“嘉道理基金会”创办及资助。“嘉道理基金会”成立于1970年，创办人贺礼士嘉道理勋爵一直秉持“助人自助”的信念。社区伙伴于中国大陆和社区及相关组织一起工作。

我们的愿景：人与人、人与大自然能和谐共处

我们的使命：与社区和相关人群一起努力，恢复人们内心与大自然的联结，探索实现可持续生活的道路和方法。

可持续生活：我们理解的“可持续生活”是在互助关爱，自力自足的社区里，人们与自然和谐共处，过着简单知足，充满安全感和创造力的生活。

网址：www.pcd.org.hk



社区支持农业项目的实习生在广西柳州帮助水稻插秧。
A group of CSA supporters help planting rice in Liuzhou, Guangxi.

There's a saying often used to depict the urban-rural relationship in contemporary China: “Town-dwellers feed country-dwellers with fake products; country-dwellers feed town-dwellers with poison”. Though it may sound a cynical joke and an exaggeration, it captures a truth: when all productive activities aim only at economic growth, the resulting endless pursuit of higher productivity and higher income lead to loss of quality and integrity. The urban and the rural communities, that appear to be disjunct, are in fact in an interdependent and mutually supportive relationship. The problem we are confronted with is how to enable a virtuous cycle of interaction in this relationship.

Since 2003, PCD has been exploring the potential of Community-Supported Agriculture (CSA) to bring about positive development in the urban-rural relationship. Urban dwellers may start to support local production of organic food simply because of their worries about food safety. However, it is hoped that as they continue to learn about choices of food, stories of the rural producers and the environment we live in, they will begin to reflect on the urban-rural relationship, urban lifestyles, environment, and current modes of consumption. Consequently they may reflect on how modernization and development of the global market affect the sustainable development of their communities – including their vulnerability to the impacts of peak oil and climate change.

More and more organisations and people are concerned with and acting on these issues. In 2006, PCD launched the CSA Internship Programme to enable young people with such dreams to put them into practice. Those taking part in the programme learn and reflect at the same time, while host organisations and communities help to train facilitators and team members. During their internship, interns may also apply for small grants from PCD to organise CSA activities, which may focus on urban-rural interactions, ecological degradation, sustainable rural livelihoods and other issues. The emphasis of the programme is to strengthen the national CSA network. It is also a platform for the exchange of experience between interns and host organisations, both of whom gain learning opportunities in the process.

In 2005, PCD began collaborating with Kadoorie Farm and Botanic Garden to provide technical support to the CSA network in China. In the following two years, ecological agricultural training was organised in Liuzhou, Guangxi and Beijing. The programme has been enthusiastically supported by, among others, Ainong Hui in Liuzhou, James Yen Rural Reconstruction Institute in Hebei (now known as the Guoren Urban-Rural Mutual Aid Co-op), Liang Shuming Center for Rural Reconstruction, and the Waldorf School in Chengdu.

Ainong Hui was established at the end of 2005. Using the *Tusheng Liangpin* (Wholesome Local Products) restaurant as a platform, the organisation has been introducing local cuisine to urban consumers and actively encouraging farmers to grow local and traditional varieties of crops. By encouraging exchanges between urban consumers and rural farmers, Ainong Hui has been acting as a bridge of mutual support and trust between the urban and rural communities, while fostering a more harmonious relationship between farmers and nature.

Besides supporting CSA, the Waldorf School in Chengdu, too, has been working hard to build a relationship of mutual trust and support between producers and consumers. A corner of the library of the Waldorf School has been used by the interns to introduce organic farming, and to encourage a healthy lifestyle and a consumption pattern that protects the ecology.

The CSA interns have documented the processes and the results of their learning. These have appeared in publications of the host organisations, including the yearbook of the Waldorf School, the *Tusheng Liangpi* local newspaper published by *Ainong Hui*, the Rural Reconstruction Newsletter published by Liang Shuming Center for Rural Reconstruction, and Bi Lin Ni Tu Xiang (“Fragrance of the Earth in the Neighbourhood”) published by PCD. It is hoped that documenting these stories will allow beneficial practices to be passed on to more activists, and contribute to the common effort to nurture healthy land, healthy food and a wholesome lifestyle, resilient to disruptions in the global climate and economy.

Partnerships for Community Development (PCD)

Established in Hong Kong in May 2001, Partnerships for Community Development (PCD) is an organisation set up and funded by the Kadoorie Foundation, a Hong Kong-based trust founded in 1970 by the late Sir Horace Kadoorie, who lived by the motto: “help people to help themselves”. PCD works with communities and groups in Mainland China. Our vision is: Communities in which people live in harmony with each other and with nature. PCD works to re-connect people's hearts with nature and to explore ways to live sustainably. By sustainable living, we mean that people live simply, in harmony with nature and in locally self-reliant communities. People support each other, are content, creative and secure.

Website: www.pcd.org.hk



1967年，梅伟义在英国兰开夏郡帮助皇家鸟类保护协会莱顿莫斯自然保护区修葺一间观鸟屋的屋顶。

Starting early: David Melville thatching the roof of a birdwatching hide, RSPB Leighton Moss Nature Reserve, Lancashire, UK, 1967.

梅伟义：四十六年 心系保护志不改

In for the long haul:

David Melville

访问及撰文：费乐思 (香港嘉道理农场暨植物园)

Interviewed by John Fellowes (KFBG)

您是如何对大自然产生兴趣的？

我是在一个对自然历史有着浓厚兴趣的家庭里长大的。我的母亲热爱种植花草，园艺知识丰富。我的父亲是一名普通的医生，但如果可以选的话，他倒是更希望成为一名海洋生物学家。父亲对植物和蝴蝶也有浓厚的兴趣。后来，哥哥选择了植物学之路。我记得小学时，有一次，我把暑假收集到的一些东西交给老师，有一块黄铁矿，一些贝壳，还有压干的万寿菊花 *Chrysanthemum segetum*（当然那时我对学名一窍不通），想不到竟然还得了个奖。

直到上了中学，我才决定好好地研究鸟类。打从那以后，大多数闲暇时间，我都在观鸟，定期记录附近湖泊上水鸟数量，并将这些资料交给当地观鸟协会。我的生物老师们给我很大的支持，其中一位就是植物学家奥列·波卢宁(Oleg Polunin)。

您从事保护的原动力来自哪里？受到过什么特别的触动？

那是个人生的拐点。1964年。我读了蕾切尔·卡逊（Rachel Carson）写的《寂静的春天》。书中提到，有机氯农药毒害导致美国东部鸟类数量大减的情况，这让我深受触动。

还有1967年发生的一起沿海石油严重泄漏事件。那一年，美国大油船托里峡谷号，在英吉利海峡西南部触礁沉没，大量原油流入海峡，杀死了大批海鸟。我在同学中间募捐，并收集了旧床单，寄给相关机构，帮助清洗鸟身上的油污。

上了大学，我有幸师从帕尔默·纽博尔德（Palmer Newbold）和阿姆严·麦迪恩（Amyan Macfadyen）。纽博尔德是伦敦大学保护生物学课程的创始人，麦迪恩则是60年代国际生物学项目知名学者。

您为何会选择来到香港？您初来之时，香港的环境保护状况如何？

我当年是受邀到香港帮助解决原来的启德机场鸟患问题的。当时，飞机和雀鸟相撞的主要风险来自黑耳鸢，而射杀它们绝不是解决问题的办法。所以，我的任务就是让机场不再招惹这种鸟。后来，我们将一条主要的污水道延长，令其在海港的出水口远离飞机场。鸟患问题变得少多了。

1974年，我到香港的时候，郊野公园计划刚开始。当时的港督麦理浩爵士对这个项目很支持，但主要目的是为了提供休闲场所，对野生生物保护的关注并不多。香港观鸟会是当时强烈提倡保护的机构，而弗雷德·海赫特尔和迈克·韦伯斯特的“敢言”更是不时地刺痛政府。

英国广播公司电台节目播出了帕特里夏·佩恩的纪录片之后，香港的野生动植物贸易吸引了很多国际关注，那时食用野生动物的数量十分惊人（例如：一年超过15,000猛禽被食用），它们所遭受的虐待也让人震惊。好像是为了防止猛禽伤人，贩卖者就折断它们的喙；一些被兽夹或套索捉到的动物，如猪獾，只剩下三条腿等等。

当时，生物多样性保护在香港被认为是“西方”的事情，和广大的、为生计奔波的老百姓似乎扯不上关系。政府对野生动植物贸易及虐待动物的执法也做得很不够。现在情况很不同了。

捕捉鸟类和动物曾经风行一时，比如：画眉鸟常被捕来放在笼中供人赏乐，而穿山甲则成为盘中美味。奇怪的是，当新界高速发展时，捕猎压力反而较1970年要小得多，而很多野生动物的数量也丰富了许多。我到香港不久，这里就有一个在香港最主要的湿地——后海湾的米埔边上的淡水湿地修建高级住宅区的计划。早些年，斯科特爵士就已经向香港政府提出，把米埔建成环境教育的保护区，但是政府却一直没有行动。那个住宅计划的威胁令香港观鸟会、长春

How did you become interested in nature?

I was brought up in a family where we all had wide ranging natural history interests. My mother was a keen and knowledgeable gardener and my father, who was a general practitioner but would have preferred to be a marine biologist, had a particular interest in plants and butterflies – my brother went down the plant path. I remember winning a prize at primary school for a collection of ‘things’ I made over the summer holidays – this included a lump of iron pyrites, sea shells and a pressed Corn Marigold *Chrysanthemum segetum* (although, of course, I didn’t know about scientific names at that age!).

It wasn’t until I was at secondary school that I decided I wanted to study birds in detail – most of my spare time was spent birdwatching and I made regular counts of waterfowl on local lakes and submitted my records to the local bird society. I received a lot of encouragement from my biology teachers, one of whom was the botanist Oleg Polunin.

What made you want to get involved in conservation? Any formative influences?

Reading Rachel Carson’s *Silent Spring* in 1964 was one turning point. The dramatic declines of birds in the eastern USA as a result of organochlorine pesticide poisoning appalled me.

In 1967 the super-tanker Torrey Canyon ran aground and broke up off the coast of Southwest England releasing a huge oil slick and killing large numbers of seabirds – one of the first big coastal oil spills. I raised money from fellow school students and got some old sheets and sent them off to help with cleaning the birds.

At university I was lucky to have Palmer Newbold and Amyan Macfadyen as biology professors – the former had set up the Conservation Ecology course at London University and the latter was prominent in the International Biological Programme in the 1960s.

What brought you to Hong Kong? What was the conservation situation when you first came?

I came to Hong Kong to get rid of birds from the old Kai Tak airport – Black-eared Kites *Milvus migrans* were the main problem in terms of birdstrike hazard to aircraft, and shooting wasn’t the solution. I was tasked to come up with a plan that would make the airport less attractive to birds – in the end we extended a major sewer to discharge into Hong Kong harbour away from the airport and this substantially reduced the problem.

When I arrived (1974) the Country Parks programme was just gearing up, with strong support from the then Governor, Sir Murray MacLehose, but this concentrated on providing recreational opportunities and there was relatively little awareness of wildlife conservation. The Hong Kong Bird Watching Society (HKBWS) was, at that, time a strong advocate for conservation, with Fred Hechtel and Mike Webster being particular thorns in the side of the administration.

The trade in wildlife attracted a lot of attention internationally following the broadcast on the BBC of a documentary radio programme by Patricia Penn. Not only were the volumes large (e.g. 15,000+ birds of prey a year for eating), but the conditions in which animals were kept were appalling – birds of prey had their beaks broken off so they wouldn’t peck people, mammals such as Hog-badgers *Arctonyx collaris* caught in gin traps and snares had feet missing, etc. etc.

At that time conservation was seen as a ‘western’ activity of little relevance to the population at large who were often struggling in quite hard conditions to improve their lot. The Government did little to enforce the trading regulations or the cruelty laws at the time – things have improved enormously now.

There was also a lot of trapping of birds such as Hwamei *Garrulus canorus* for cage pets and mammals such as Pangolin *Manis pentadactyla* for consumption. Rather surprisingly, as the New Territories have become increasingly developed there is less trapping pressure and populations of many species are higher than in the 1970s.

Almost as soon as I arrived there was a proposal to build an ‘up market’ housing estate on freshwater wetlands at the edge of the Mai Po marshes, Deep Bay. Some years earlier Sir Peter Scott had proposed to the Hong Kong Government that Mai Po should be developed as an educational reserve, but nothing had been done. The threat of the housing project prompted strong reaction from both HKBWS and The Conservancy Association, and from overseas bird conservation groups. The development still went ahead (Fairview Park), but the Government declared Mai Po a restricted-access area and this set the scene for the future development of the nature reserve (which started 10 years later!).

You went on to become the first manager of Mai Po Marshes Nature Reserve. What were the first challenges as manager? Did you have much support at that time?

When I returned to Hong Kong in 1984, WWF had acquired three gei wai [tidal shrimp ponds] at Mai Po. My first job was to get habitat management started and to oversee construction of bird watching hides, paths, the floating boardwalk through the mangroves and the education centre. People thought I had a wonderful job in which I spent all day bird watching – in fact I probably did less bird watching when I worked at Mai Po than at any other time in Hong Kong! At first I worked alone – everything from clearing paths upwards.

The Mai Po project could never have started without financial support from the Royal Hong Kong Jockey Club. Subsequently many other corporate and individual sponsors have supported Mai Po. WWF Hong Kong has always been very fortunate that it has attracted many people to support its work through serving on voluntary committees – the Management and Education Committees were invaluable in the early days in providing a sounding board for ideas and in the development of educational materials for use in the school programmes.

社以及一些外国鸟类保护团体反应强烈。然而，住宅项目并没有取消，也就是现在大家看到的锦绣花园。但令人欣慰的是，政府也同时宣布米埔成为一个限制进入区。这一决定，为米埔在十年之后成立为一个保护区奠定了基础。

您后来当上了米埔沼泽湿地保护区的第一任经理。您遇到了哪些困难？是否得到很多的支持？

当我1994年重返香港时，世界自然基金会在米埔已拥有三个基围虾塘。我的第一个任务，是启动栖息地的管理工作，同时开始监督兴建观鸟屋、小径、通过红树林的浮桥和教育中心。外人认为我找到了个优差，可以成天观鸟——事实上，那段时间是我在香港看鸟时间最少的。刚开始的时候，我一个人做所有的事情，开小径什么的都做，事事都得亲力亲为。

没有香港赛马会的支持，米埔的工作就不能开展。随后，米埔也接受了越来越多的商业团体和个人的捐款和支持。一直以来，世界自然基金会香港分会有幸得到许多人的支持，如参与一些志愿性质的委员会。在保护区成立初期，管理和教育委员会为米埔的建设贡献了很多好点子，还协助开发了许多为学校而设的环境保护教材。

一些观鸟爱好者，对建立米埔教育保护区，是持保留态度的。他们认为，学校的参观，会干扰鸟的栖息——“我正看一只很稀有的鸟，结果一群学生走过，就把鸟给吓走了。”幸好这种想法改变了。人们逐渐意识到，米埔的未来，必须依靠更广泛的公众支持。而这种支持，必须要通过教育公众，提高他们的保护意识来获得。

观鸟比赛是米埔重要的筹资盛事。怎么想起举办这个活动？

有一次，尹琰(Clive Viney)和米湛士(Mike Chalmers)在吃中午饭时打赌，看谁能在24小时内录到最多种鸟。而何桃君(Mary Ketterer)刚好听到，她立即看出这是一个为世界自然基金会筹资的机会。开始的时候，观鸟比赛的规模很小；这些年发展很迅速，观鸟比赛已经成为米埔扩大湿地面积、发展以及管理的重要资金来源。当初，香港政府同意世界自然基金会接管米埔的前提，就是要世界自然基金会独立筹募经费。观鸟大赛，让我们展示出非政府机构可以在香港募得可观捐款，开展保护工作的能力。我们在这方面的成功，也鼓励政府在日后给我们提供资助。

这以后，你又担任了世界自然基金会（香港分会）保育总监的职位。这个职位，对您来说，应该不仅是一个机遇，也是一个很大的挑战吧？您当时是如何确定您的工作重点的？

当时，香港的私人发展商在新界低地区域囤积了不少农地，等待建高尔夫球场（有一段时间盛传，由于在香港打高尔夫比日本要便宜得多，所以日本人会飞到香港来过周末，打高尔夫。）或者是住宅区的机遇。那时候，香港政府也在新界进行大规模的渠务和道路的工程，还有填海等项目。

尽管1970年后期就成立了香港环保署，但其主要的工作重心还是停留在治理，比如：水污染和空气污染，对生态保护关注很少。

为了让生态评估走上正轨，我花费了不少时间和精力。当时一个典型的手法，就是在冬季调查两栖和爬行动物，然后宣称该地没有两栖和爬行动物出没。另外就是缓减措施的问题。从理论上来说，空气和水污染可以在源头处理，但要缓解陆地和水生栖息地的丧失则要困难得多。很多早期的生态补偿地很小，毫无生态价值，但我坚持把这一套体系建立起来。

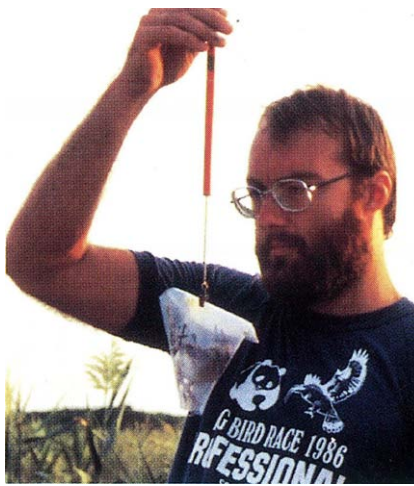
您是否还曾经做过一些打击国际野生动物贸易的工作？

在二十世纪七十年代，我在渔农署工作时，曾经接触到一些野生动物贸易方面的事情——当时香港正在起草条例，准备为执行《濒危野生动植物种国际贸易公约》立法。公约一旦通过，我们就一定要进行执法了。那时候稀有的鹤类（如：白枕鹤）从中国偷运出来，经香港出境，卖到欧洲。皮毛贸易活动也很猖獗（包括老虎皮、豹子皮、猎豹皮），还有盔犀鸟的盔突、用来雕制鼻烟壶。

香港是国际象牙贸易的主要市场，我参与了贸易调查和促进象牙贸易商、雕刻业界以及“西方”环保人士之间的交流等工作。西方保护团体对亚洲文化知之甚少，这种不了解在处理传统中药贸易时尤为突出。实际上，环保人士和中医师有一个相同的利益：两者都不希望看到可作药材的动植物绝种，所以问题的关键是如何携手合作，而不是执着于“文化”和“原则”的分歧。

您在中国大陆的生态保育方面也做了一些工作。您当时主要是想做什么？像您这样的一位‘老外’生态保育专家，在大陆工作，比起在香港，是不是会面临着更多的文化差异？

起初，我主要是在鄱阳湖等湿地保护区工作，培训保护区人员和协助制定管理计划。工作开始的时候确实很艰难，特别在人类活动强度很大的湿地，比如辽宁



Some bird watchers had mixed reactions to the establishment of an educational nature reserve at Mai Po, and regarded school parties as causing disturbance to the birds – ‘I was watching this [rare species] when the school group came past and the bird disappeared into the bushes.’. Thankfully

this mindset changed as people came to realise that the future of Mai Po lay with widespread public support and that this was best achieved through increased public awareness and education.

The Big Bird Race became an important source of funding for Mai Po. How did that come about?

A lunchtime wager between Clive Viney and Mike Chalmers as to who could see the most birds in Hong Kong in a 24 hour period was overheard by Mary Ketterer who immediately saw the fund raising possibilities to support WWF Hong Kong. From humble beginnings it grew enormously and over the years has provided vital support to the expansion, development and management of the Mai Po Marshes Nature Reserve. When the Hong Kong Government first agreed to let WWF HK set up Mai Po it was on the basis that WWF had to fund it – the BBR allowed us to demonstrate that an NGO could raise substantial funds for conservation in Hong Kong, and this later encouraged the Government to contribute as well.

And then you became Director of Conservation for WWF Hong Kong. Quite an opportunity, but a daunting challenge: what were your priorities?

Private developers had accumulated considerable holdings of farmland, mostly in the lowland parts of the New Territories, and were looking for opportunities to build golf courses (at one time it was claimed that Japanese would come to Hong Kong to play golf for a weekend as it would be cheaper than playing in Japan!), and/or housing. At the same time Government was forging ahead with major drainage and road projects in the New Territories, as well as coastal reclamation projects.

Although the Environmental Protection Department (or similar agency) had been in existence since the late 1970s, it focussed on ‘end of pipe’ issues – water and air pollution – little attention was given to ecological matters. I spent a lot of time trying to get ecological assessment conducted properly. A typical ploy had been to survey amphibians and reptiles in winter and then claim that none were present! Then there was the issue of mitigation. Whereas air and water pollution could (in theory, at least) be dealt with at source, it was much more difficult to deal with the loss of terrestrial and aquatic habitats. Many of the early mitigation sites were very small and of no ecological value but I persevered to get the principle established.

And weren’t you also involved with tackling the international wildlife trade?

Whilst working for the Agriculture and Fisheries Department in the 1970s I had some involvement in trade issues – this was when legislation had to be drafted to implement CITES in Hong Kong and, once passed into law, we then had to enforce it. At that time the rarer cranes (e.g. White-naped, *Grus vipio*) were being smuggled from the Mainland, through Hong Kong to Europe. There was also an extensive trade in fur skins (including Tiger *Panthera tigris*, Leopard *Panthera pardus* and Cheetah *Acinonyx jubatus*), and hornbill ‘ivory’ (from the Helmeted Hornbill *Rhinoplax vigil*), which was used for carving snuff bottles.

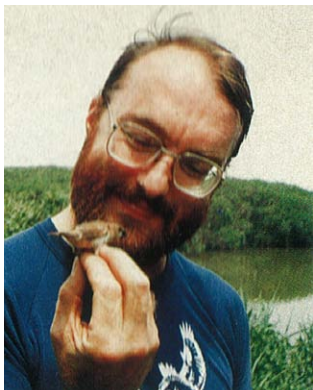
Hong Kong was the major market for the international ivory trade and I was involved in trade studies as well as trying to promote communication between traders and carvers, and conservationists in ‘the West’. There was very little understanding of Asian culture among most western conservation groups and this became even more apparent when attention turned to trade in traditional medicine items. In fact, both conservationists and traditional medicine practitioners have a common interest in ensuring that species do not become extinct, but the challenge is to build on the common ground rather than go for a head-on clash of ‘cultures’ and ‘principles’.

You also came to be involved in Mainland China – what were you trying to do there? Were there extra cultural barriers to overcome for a *laowai* conservationist?

Initially I worked at a number of wetland nature reserves, such as Poyang Lake, running training courses for the staff and assisting in the development of management plans. This was very challenging especially in view of the great range of human activities occurring at some sites – at Shuangtaizihou, Liaoning, the reserve lies over a major oil field, it encompasses the largest commercial *Phragmites* reed farm in the world, and much of the intertidal area was being reclaimed for rice farming...and in the midst of this was the largest known breeding population of Saunders’ Gull *Larus saundersi*.

After some years it became obvious that we also needed to engage in policy at a national level and we did the ground work for the development of the China National Wetland Policy, which involved some 17 national-level Government agencies. I’ve been very lucky to work with some very dedicated conservationists in the Ministry of Forestry and the Environmental Protection Agency, the Institute of Zoology of the Chinese Academy of Sciences, and universities, as well as provincial-level agencies. They have helped me understand much about China’s biodiversity and conservation issues.

I remember when we undertook a review of nature reserves in China (*A Biodiversity Review of China*, 1996) asking about the large number of ‘paper’ nature reserves with nothing on the ground – no staff, no buildings, no management activities. I was told that if the authorities waited until resources became available there would be nothing left to protect – by declaring a lot of reserves, and accepting that many would be lost or severely degraded, there should be some left in future when funding could be found. A very pragmatic approach, but quite different from a conventional western one!



1988年3月，梅伟义（前排左起第三位）和生态保育专家一起与江西鄱阳湖国家级自然保护区工作人员一起合影。

David seated front row 3rd from left, with conservationists and staff of Poyang Lake National Nature Reserve, Jiangxi, March 1988.



2009年6月，梅伟义在阿拉斯加诺姆手捧一只雄性斑尾塍鹬。
David with a male Bar-tailed Godwit Limosa lapponica, Nome, Alaska, June 2009.

的双台子河口保护区。保护区下面是个大油田，还有世界上最大的芦苇产地，很多海滨区域都被围垦，用来种植粮食。在保护区的中心，就是全世界最大的黑嘴鸥繁殖地。

过了几年以后，我们发现参与国家政策层面的工作也非常重要，于是开展了一些基础工作，来支持国家湿地政策的出台。这项工作涉及到17个国家级单位。

我有幸和一群非常敬业的环保人士一起工作，他们来自国家林业局、环保总局、中科院动物所、大专院校、省林业局和保护单位。这些同事帮助我更深入了解中国的生物多样性和保护议题。

我记得，当我们在编写中国保护区的评估报告（《中国生物多样性》1996）的时候，问到为什么存在着大量的“纸上”保护区（即：没有人员编制、没有办公地点、没有管护）。我得到的回答是，如果等到资源都齐备了，再建保护区的话，那么就没有什么值得保护的剩下来了。把众多保护区先圈起来，尽管其中的很多会在日后保不住，或者生态状况会严重恶化，但总有一些会留存下来，等资金到位的时候就可以得到真正的保护。这种保护策略和西方传统的方法很不同，但却很实际。

那么，您在二十世纪九十年代的工作重点有没有什么改变？

香港低洼地区的不断发展迫使我们必须采用新的保护方式。和其他的环保团体不同，世界自然基金会香港分会对发展商采取的是“打开大门”的政策。我们关注的是保护的成效，而不是对一切发展都持否定的态度——长远来讲，这样是不现实的。有些地点，比如作为全球的蜻蜓重要栖息地的沙螺洞，就没有办法和住宅区以及高尔夫球场的发展计划结合起来，但是后海湾附近的一些区域却有可能与上面提到的项目相结合，而取得相赢。

现在回想起来，您在香港和大陆所做的工作中，那些让您特别有成就感？

保护所取得的一点一滴的成果都凝聚了许多人长时间的辛勤劳动。让我最感欣慰的是，每次回到香港，虽然不断看到后海湾边界两侧被城市扩张侵占，但米埔却依然草长莺飞，百鸟翔集。

那么，有什么让您觉得遗憾的呢？

中国及东亚其他地方海岸湿地的不断丧失，让我很忧心。尽管当地的保护人士做了不少卓有成效的工作，但经济的空前发展，还是对成千上万涉禽赖以生存的生境带来了巨大的破坏。黄海之滨、鸭绿江畔是斑尾塍鹬迁徙的主要中转站，那里正受到填海工程的影响。

您不想对中国的保护工作者说点什么，对他们表示鼓励，或者分享一下您这么多年积累的心得，以帮助他们做出更有成效的工作？

我想说的是：保护工作任重而道远——成功都要通过长时间的努力。从推动香港签订湿地公约（当我还在渔农署工作的时候），到米埔和后海湾被划为国际重要湿地，中间相隔了16年，但是漫长的等待是值得的。

保护工作只有在广泛的支持下才能成功，但一定要建立在可靠的科学基础上。不要把复杂的问题简单化，要想法把复杂的信息，用公众可以理解的方式表达出来。但是，也不能用好像“拯救大象、停止象牙贸易”等听起来简短有力、但过于简单的方式。这些口号很受公关顾问的青睐，但实在有辱公众的智慧。这种方式可能会收到短期效果，但当公关人士的兴趣转移到另外一个热门话题时，生态保护者却要花更长的时间去解决上一个问题。

我们不可能赢得所有的战役，但可以从每一场战斗中学习。

现在您退休了，在新西兰定居，这是不是意味着您终于拥有了一个平静的、远离是非非的生活？

当然不可能啦！我刚刚结束了在地方保护委员会第二个三年的工作。这是受保护部委任的一个工作，其中许多工作是提供建议，比如：要在一个保护着全球80%的斑点楔齿蜥（“活恐龙”）的保护区开发生态旅游；在一个生长着特有植物的地方开采白云岩。还有就是为阿贝尔塔斯曼国家公园的管理工作提供建议。这个公园虽然是新西兰最小的国家公园，但它一年的游客接待量却数以万计。

我也是新西兰鸟类学会理事——这个协会主要致力于促进鸟类的科学研究，不进行倡导游说工作。但我们还是发现，我们研究的数据常常在一些规划的听证会上派上用场，例如风电场和沿海水产养殖的发展。

我正对在新西兰和北极繁殖的涉禽进行研究。斑尾塍鹬的研究让我常常得以走访迁徙路线上的一些站点，包括中国、韩国和阿拉斯加。我最近开始了一个长期的、关于新西兰特有的蛎鹬Haematopus unicolor的项目。这种鸟最大的种群在塔斯曼湾，离我住的地方不远。

我得走了，因为我还需要时间整理我为环境法庭准备的一些证据。这是关乎一个修建水力发电站的申请。受影响的河流是世界种群10%以上的黑额燕鸥Sterna/Cblidonias albostrata的栖息之所。

Did the focus of your work change during the 1990s?

The increasing development of the Hong Kong lowlands required new approaches to conservation. WWF HK, unlike some other NGOs, adopted an open-door approach to developers. Rather than simply say ‘no’ to everything and hope to hold back development, which was not sustainable in the long-term, we wanted to look for conservation gains. There are some sites, such as the Sha Lo Tung Valley with its globally important dragonfly fauna, where I could see no way of combining housing and/or golf course development with retention of the biodiversity values, but some other sites around Deep Bay offered interesting opportunities.

Looking back, are there things in your Hong Kong / China time that give you a particular sense of achievement?

The successes in conservation are the result of hard work by a great many individuals over a long period of time. It is wonderful to be able to return to Hong Kong and still find Mai Po filled with a vast array of birds, despite the creeping urban sprawl encroaching on Deep Bay on both sides of the boundary.

Conversely, anything you feel disappointed by?

I’m very concerned by the ongoing loss of coastal wetlands in China and elsewhere in East Asia. Despite some very good work by local conservationists the economic behemoth tramples everything in its path to the detriment of millions of shorebirds dependent on these areas. The major migratory stopover for Bar-tailed Godwits Limosa lapponica in the Yellow Sea at Yalu Jiang, Liaoning is subject to ongoing reclamation.

Any words of encouragement, or tips picked up along the way, that might help China’s conservationists defend more of wild nature?

Conservation is a long-term business – the successes often take a long time to achieve. It was 16 years between getting Hong Kong to sign up to the Ramsar Convention (when I was working for the Agriculture and Fisheries Department) and getting the Mai Po/Inner Deep Bay site declared as a Wetland of International Importance under the Convention– but it was worth the wait!

Conservation can only be successful with popular support, but it must be science-based to be credible. Do not ‘dumb-down’ the complexities of issues, but find ways of getting messages, which may be complex, across in a manner which people can understand. Simple, sound-bite conservation messages such as



1997年，梅伟义在内蒙古鄂尔多斯高原上观察遗鸥。
David looking at Relict Gulls Larus relictus, Ordos Highlands, Inner Mongolia (approx. 1997)

‘save the elephant, stop the ivory trade’ appeal to PR consultants but insult the public by presenting a grossly oversimplified message. It may work in the short-term, but conservationists will still be trying to fix the problem long after the PR people have moved on to another topic.

We can never win all the battles, but you learn from each one.

Now you’re ‘retired’ and based in New Zealand. Does that mean a quiet life away from all the controversies?

No way! I have just completed two three-year terms on the local Conservation Board, appointed by the Minister of Conservation – among the many matters we were asked to advise on was opening up a nature reserve with 80% of the world population of Tuatara Sphenodon sp. (a ‘living dinosaur’) to eco-tourism, continued quarrying of an area of dolomite with endemic plant species, and management of the Abel Tasman National Park, New Zealand’s smallest, which receives tens of thousands of visitors a year.

I’m also a council member of the Ornithological Society of New Zealand – the society promotes the scientific study of birds and does not engage in advocacy, but nonetheless we find that our data gets called upon for planning hearings, e.g. in relation to wind farm and coastal aquaculture developments.

I’m active in studies of both New Zealand and Arctic-breeding shorebirds. Our work on Bar-tailed Godwits has enabled me to visit a number of sites along the flyway, including China, South Korea and Alaska. I have recently started a long-term project on the New Zealand endemic Variable Oystercatcher Haematopus unicolor which has its largest population in Tasman Bay, near where I live.

I’d better go now as I have to finalise my evidence for an Environment Court hearing on an application for a hydroelectric scheme on a river which supports more than 10% of the world population of Black-fronted Terns Sterna/Cblidonias albostrata



1993年，孟沙（国家林业局官员），梅伟义和何桃君（世界自然基金会香港分会荣誉主管）在辽宁双台子河口自然保护区寻找繁殖的黑嘴鸥。
With Meng Sha (State Forestry Administration) and Mary Ketterer (Honorary Director, WWF HK), Shuangtaizhekou Nature Reserve, Liaoning, 1993 – looking for breeding Saunders’ Gulls Larus saundersi.



果子狸的生态学研究

Ecology of the Masked Palm Civet (*Paguma larvata*)

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2003年，一场“非典（SARS）”使名不见经传的果子狸遭到一场空前“劫难”的同时也成为万众瞩目的对象。然而我们对其野生状态下的生态学和生物学知识却了解甚少。为了让大家能够真实了解果子狸，在香港嘉道理农场暨植物园和欧盟第六框架项目的共同资助下，作者对具高度食果性的果子狸（*Paguma larvata*）的行为生态学及其在森林种子传播中的作用进行了调查研究。

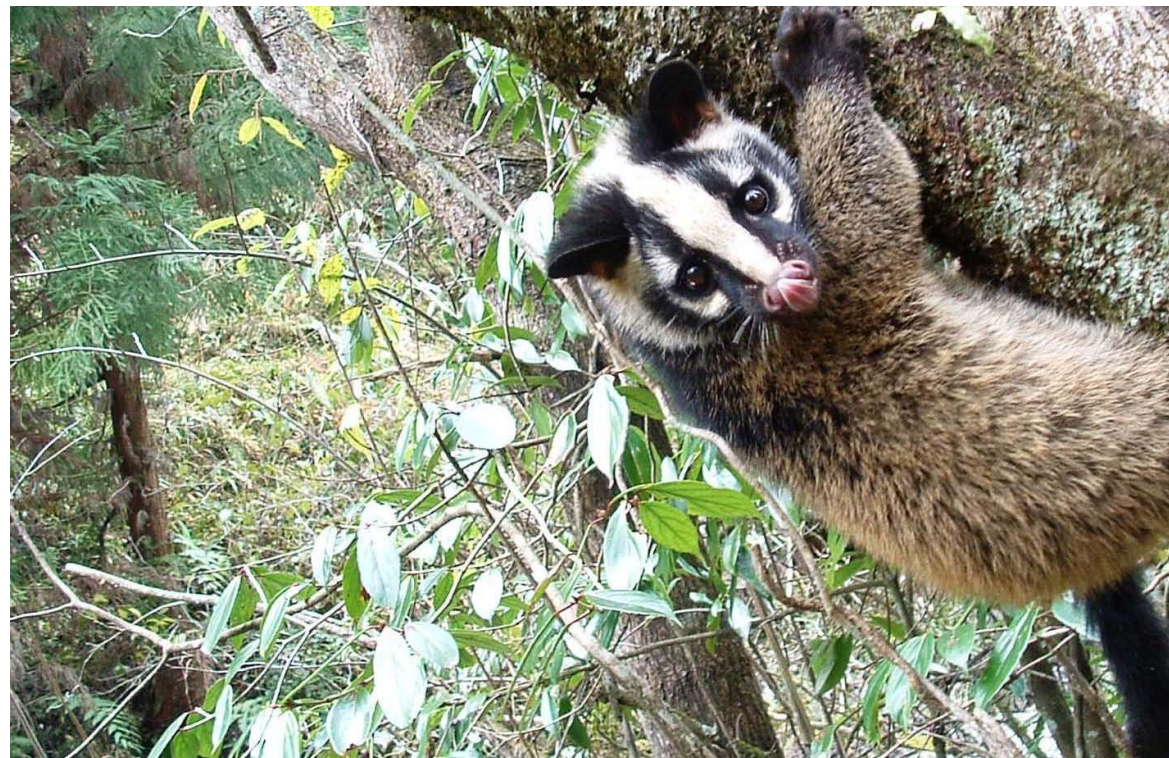
野外研究地选择

到哪里去研究野生果子狸，成了我们野外工作的首要问题。果子狸学名花面狸(*Paguma larvata*)(英文名：Masked palm civet)，属食肉目灵猫科果子狸属，主要分布在热带和亚热带丛林，偶尔也出现在居民点附近。果子狸是灵猫科动物中分布最广的一种，从巴基斯坦北部到马来半岛、苏门答腊、婆罗洲、华东、华南，乃至安达曼和尼科巴群岛，几乎只要有森林的地方就有它们的身影。如此广布的动物，我们该如何选择一个合适的地点去研究它们呢？从生态学研究的角度考虑，这个地点要便于观察与研究。但是在欧盟项目支持下，我们还需要与别的研究团队合作开展病毒学和流行病的研究。因此，从病毒学研究的角度考虑，即便于研究者到野外采集样品。由于是与中国科学院武汉病毒研究所合作开展研究，所以选点上要考虑距离湖北省武汉市越近越好。

2004年初，经湖北省林业局和武汉病毒所病毒学研究专家的推荐，我们把研究地点选择了湖北省宜昌市后河国家级自然保护区，保护区位于湖北省西南部的五峰土家族自治县中南面，属武陵山脉东段余脉的一部分山地。保护区地处中亚热带到北亚热带的过渡区域，一年分为明显的四季，冬天冷，夏天较为潮湿、热。保护区除了保存有较

好的原始森林外，还有一些次生林、人工林和农田构成。过去报道该保护区有87种哺乳动物。除了果子狸，还有20种食肉动物生活在该保护区，其中包括黑熊(*Ursus thibetanus*)、猪獾(*Arctonyx collaris*)、黄喉貂(*Martes flavigula*)、鼬獾(*Melogale moschata*)以及豹猫(*Prionailurus bengalensis*)。但该区域的果子狸相对较多。

2005年，在香港嘉道理农场暨植物园的支持下，我们想在捕猎压力较大的广西再选择一个研究点开展对比研究。在广西省林业厅和广西师范大学李汉华教授的介绍下，我们先后去了弄岗、龙虎山、岑王老山保护区进行野外踩点。在弄岗保护区弄岗站，样线调查中我们发现灵猫取食后的痕迹，由于没有使用分子标记的技术手段，很难区分是果子狸还是椰子狸。在龙虎山保护区，通过对当地几位过去经常打猎的猎人的了解，此地的果子狸猎捕较为严



The outbreak of SARS in 2003 brought little-known civets into the limelight. But knowledge of their ecology and biology remains poor. The present study, funded by Kadoorie Farm and Botanic Garden (KFBG) and the 6th Framework Programme of the European Commission, investigated the behavioural ecology of Masked Palm Civets and their role in seed dispersal.

Study site

“Where to conduct the fieldwork?” was our first question. The Masked Palm Civet *Paguma larvata* is a small carnivore, living in subtropical and tropical forests, and also frequently found near human settlements. It is the most widespread of all civets, its range stretching from northern Pakistan and Kashmir to Indochina and the Malay Peninsula, Sumatra, Borneo, much of eastern and southern China, and the Andaman and Nicobar islands. For such a widespread species, how to select a suitable site to conduct our fieldwork? It should be a site where we could easily study the ecology. At the same time, under the financial support of the 6th Framework Programme of the European Commission, we sought to carry out epidemiological and virological studies in cooperation with another research group – Wuhan Institute of Virology (WIV), the Chinese Academy of Sciences. The site should thus allow easy collection of viral samples in the field, and be close to Wuhan.

In 2004, at the recommendation of WIV virologists, we selected Houhe National Nature Reserve (NNR) as our study area. Part of the eastern Wuling Mountains, Houhe NNR is located in the south of Wufeng Tujiazu Autonomous County in southwestern Hubei Province. This reserve straddles the middle and northern subtropical zones and has four distinct seasons, including a cold winter and a hot, humid summer. The reserve consists of primary and logged forest, plantation and farmland. Approximately 87 species of mammals have been reported. In addition to the Masked Palm Civet, 20 species of carnivore (the mammal order Carnivora) have been reported, including Black Bear (*Ursus thibetanus*), Hog Badger (*Arctonyx collaris*), Yellow-throated Marten (*Martes flavigula*), Chinese Ferret-badger (*Melogale moschata*) and Leopard Cat (*Prionailurus bengalensis*). But Masked Palm

Civets are particularly common in the study area.

In 2005, under the support of KFBG, we planned to select a new study site in Guangxi, where wildlife is subject to heavy hunting pressure, for comparison with Hubei. At the recommendation of Prof. Li Hanhua of Guangxi Normal University, we conducted preliminary surveys in Nonggang, Longhushan and Cenwanglaoshan Nature Reserves. At Nonggang we collected several civet scats, but couldn't distinguish the target species from the Common Palm Civet *Paradoxurus hermaphroditus*, as we weren't using molecular biological techniques. At Longhushan a veteran hunter told us the Masked Palm Civet was subject to heavy hunting and had a very low population density, making the site unsuitable for in-depth study. At Cenwanglaoshan civets had been hunted on the periphery of the nature reserve in 2004. We also found several tracks of Spotted Linsang *Prionodon pardicolor*, Silver Pheasant *Lophura nycthemera* and some flying squirrels during our field survey. So we selected this reserve to conduct our study. We set 20 cage traps and pitfall traps, in broadleaf forest and grass-shrubland habitats. Masked Palm Civets are arboreal and nocturnal, sleeping during the day. We waited after setting the traps. Ten days passed, a fortnight, and a month. But each time we checked the traps and changed the baits (wild fruits and dead chicken), we were disappointed.

So, we eventually conducted our 2006 study only in Houhe NNR. We hoped we could get to know the behavioural ecology of the Masked Palm Civet at this site. We would then conduct a comparative study in South China later, if we still had the energy and funding.

Field research and scientific discovery

We have now done four years of systematic study on the behavioural ecology of Masked Palm Civets and their role in seed dispersal, by means of radio tracking and faecal analyses. Analysis of 1023 dung piles and 786 feeding traces indicated more than 126 kinds of food material consumed by the civets. As for many other dietary generalists, the spatial and temporal distribution of food can profoundly affect the Masked Palm Civet's foraging decisions and prey selection. In the present



重，现在的种群密度较低，不适合在此地开展系统的研究。在岑王老山保护区，访问中，我们了解到曾经有人2004年在保护区外猎捕到果子狸。并且在样线调查中，我也发现有较低的斑林狸、白鹇、鼯鼠等动物的活动痕迹。所以，我就把研究地点定在这个保护区。我和保护区的工作人员在果子狸可能出现的地点设置了20个笼子和20个陷阱，果子狸是夜行性动物，昼伏夜出。至于它们什么时间能光临我们的笼子和陷阱，就只能耐心等待了。10天过去了、半个月、1个月过去了。我们每日都去检查笼子和陷阱，变换诱饵（鸡肉、鸡内脏、香蕉），结果总是让人失望。

因此，2006年我们把主要的精力都集中在湖北后河保护区的果子狸研究。当时我们希望先摸清一个地点的果子狸的习性后，如果还有充足的精力和财力，我们再去广西或华南的其他地区开展相关的研究。

野外研究与科学发现

本研究采用无线电跟踪、粪便分析、样线调查、结合室内萌发对照实验等技术和方法开展工作。通过近四年的研究发现，尽管果子狸分类上属于食肉动物，但却是一种高度食果的杂食性动物。基于大量的粪便（1,023）和新鲜采食痕迹分析（786）发现果子狸取食10类至少126种食物。与多数广食性物种相似，食物资源时空变化影响果子狸的食物选择与利用。在目前的研究区域，果子狸利用的食物主要包括野果、种植的果实、叶、两栖动物、爬行动物、鸟类、小型哺乳动物、软体动物和节肢动物。这些食物资源具有明显的季节性和生境变化，根据他们的时空变化，果子

狸出现相应的觅食改变。6到10月，果实是果子狸的主要食物，而其他月份，果子狸主要吃鼠类和鸟。同时，本研究还第一次实证了小型食肉动物应对食物资源空间上季节性变化采取转换觅食地的策略¹。即根据果实资源的空间分布，果子狸还出现从原始林到次生林之间的相互转换。

我们给12只果子狸带了无线电颈圈并进行了跟踪。结果表明，果子狸的平均家域为192.60（64-451）公顷。果子狸春天的家域较大，冬天较小。果子狸家域的重叠现象严重，重叠率为26%，同性间的重叠率与异性间的重叠率并没有显著的不同，表明果子狸是没有领域性的物种。果子狸的昼夜活动节律具有显著的时间变化。在夜间22点到凌晨1点具有一个活动高峰，白天8点到12点具有一个活动的小高峰。总的昼夜活动节律没有性别和月的变化。月平均活动率与月平均温度之间也没有限制的相关性。所以说，野生果子狸并没有（半）冬眠现象，因而否定了对饲养种群观察所得出的结论^{2,3}。

在目前的研究区域，我们对果子狸的种子传播效率及其在森林更新中的作用也进行的系统的研究。7月到12月之间收集的55%的果子狸粪便中具有种子，表明其是一个高度食果性的物种。果子狸至少取食67种野生果实。除了多脉青冈栎(*Quercus multinervis*)，果子狸能传播其他所有的种子。每个粪便中含有的种子数变化较大，1-13127个不等。但50 % 以上的粪便样品中的种子数都小于250。果子狸取食的果实以红色（52 %）为主。尽管果子狸偏好果肉丰富的种类，但其果



无线电跟踪
Prof. Zhou Fang with
the reserve wardens
in Nonggang

study area, available foods included wild and cultivated fruits, leaves, bark, amphibians, reptiles, birds, small mammals, molluscs and arthropods. The abundance of these food categories varied significantly among seasons and habitats, and civets altered consumption of the categories according to their temporal and spatial availability.1 From June to October, wild fruits were the main food of civets in forest habitats, whereas cultivated fruits were the main food in farmland. In contrast, from November to May civets in forested habitats primarily consumed rodents and birds. Alongside these changes was a shift from foraging in primary forest (November to May) to foraging in logged forest and farmland (June to October) – apparently related to fruit availability.

Home range characteristics of 12 Masked Palm Civets were studied by radio tracking. Home range size of civets ranged from 64 to 451 ha, with an average of 192 ha. Home range size changed seasonally, being smallest in winter and largest in spring. Average overlap between individual home ranges was 26%, regardless of gender, suggesting the species is not strongly territorial. Civets were significantly more active at night than in daytime. During the night there was a noticeable peak in activity from 22:00 to 01:00 h, and in the daytime there was another small peak from 08:00 to 12:00 h. Mean overall activity did not differ among sexes or months. No significant correlation was found between monthly mean activity and monthly mean temperature. Thus the Masked Palm Civet doesn't hibernate or undergo a winter slowdown (sub-hibernation).2, 3

Civet effectiveness as seed dispersers, and their potential in maintaining this service through an annual cycle, were also evaluated in Houhe NNR. Seeds were found in 55% of faecal samples from July to January, and belonged to at least 67 species, indicating that the species is highly frugivorous. Except for *Quercus multinervis* whose seeds were destroyed, civets could disperse all the seeds found in their faeces. The number of seeds in faeces ranged from 1 to 13,127, with half

the faeces having fewer than 250 seeds. Most consumed fruits (52%) were red. Although civets tended to prefer fleshy fruit, fruit consumption was strongly related to wild fruit plant distribution in different forests and fruit production during our two-year study period. In feeding trials in captivity, seeds of 15 species were retained for an average of 5 hours. Sampling movement data according to the civet diel foraging-activity cycle gives an estimated mean dispersal distance of 535 m, with approximately 70%, 17% and 3% of seeds moved more than 200 m, 1 km and 2 km from the parent plant, respectively. The extent of these civet “seed shadows” suggests their influence in determining forest structure will likely increase as other larger mammalian dispersers are exterminated. To better understand the seed dispersal services by frugivorous carnivores, seed dispersal by the other two sympatric carnivores, the Chinese Ferret-badger (*Melogale moschata*) and the Yellow-throated Marten (*Martes flavigula*), were also studied. They were legitimate dispersers, but efficiency as seed dispersers was different. Ferret-badgers mainly defecated in open sites which were regarded as “unsafe micro-sites” for seed germination and seedling establishment, indicating that they were inefficient dispersers.4 On the other hand, the ferret-badgers demonstrated the behaviour of digging for prey, especially in autumn when insects and amphibians hibernate underground and fruits are also ripe; after obtaining prey, they left funnel-like pits on the forest floor. These pits could enhance the recruitment and survival of seedlings by acting as “seed traps”. The martens transported seeds over long distances and thus were legitimate and efficient dispersers.5, 6

Role in forest recruitment and regeneration: implications for conservation

Masked Palm Civets and several sympatric frugivorous carnivores are dominant dispersers of plants bearing fleshy fruits. They can disperse seeds within homogeneous habitats and across heterogeneous habitats. With large foraging ranges, long seed passage times in their gut, and selection of particular

* 除另行标明外，所有照片均由作者提供。
All photos are credited to the author, unless otherwise stated.





实利用仍明显与果树的分布以及果实的产量显着相关。15种种子在果子狸肠道中的通过时间为5小时。模型预测表明，果子狸传播种子的距离是535米。近70 % 的种子 > 200米，17 % 的种子 > 1000米，3 % 的种子 > 2000米。这些结果显示，伴随着其他大型哺乳类种子散布者的消失，果子狸对森林的更新中具有更显着的影响。

为了更好地理解食果性食肉目动物对种子的传播作用，对另外两种果子狸同域分布的食果性食肉目动物鼬獾 (*Melogale moschata*) 和黄喉貂 (*Martes flavigula*) 的种子传播作用也进行了研究。结果表明，鼬獾和黄喉貂都是合格的种子传播者，但在种子传播效率方面存在差异。鼬獾的粪便主要是在不利于种子萌发的微生境点，如小石包或裸石上，并且其具有粪便标记行为⁴，因此鼬獾并不是一个非常高效的种子传播者。但鼬獾还能通过另外一种机制促进森林更新，即常常通过挖土取食地下的无脊椎动物，这些取食后留下的“小坑”有助于埋藏与保护种子，因而促进森林更新。黄喉貂能携带较多数量种子到较远的生境中，并且消化作用并不降低种子的萌发，因而是一个高效的种子传播者^{5,6}。

在森林更新与恢复中的作用：保护的启示

果子狸及其伴生的几种食果性食肉动物是亚热带鲜果种子的主要散布者，并且这些动物多是广生境的种类，其不仅能在原始生境中传播种子，而且能在原始生境与破损生境之间传播种子。由于食肉动物具有较大的活动范围与能力，因而其具有长距离种子传播的能力。果子狸等几种食果性食肉动物具有较大的咽喉，能吞咽较大的种子，对森林中大种子的传播具有重要意义。因此，这些动物在森林生态系统植物多样

性维持以及破损森林生态系统的恢复具有十分重要的作用。

但遗憾的是这些动物多数属于常见种，并且不在保护之列，因而常常被猎捕作为野味或毛皮动物出售，种群数量在日趋减少。特别是SARS后，新一轮日益增加的非法盗猎行为正在危急着这些广布物种的生存。如何保护这些常见种⁷，使其在维持和修复森林生态系统中起着更加积极作用⁸，需要更多的有识之士投入更多的研究与保护工作，需要社会各界更多的关注和参与。

本研究是首次在亚热带地区开展食果性食肉动物在森林更新与恢复中的作用研究⁵。亚热带果实的丰富度具有明显的季节性，春天较少，而秋天较多。虽属于食肉目，果子狸等几种食果动物已适应了这种果实季节性的变动，秋季食物中含有较高的果实比例。果子狸等几种食果性食肉动物也是热带常见的动物，但到目前为止并未见详细的研究报道。特别是热带地区果实是全年都比较丰富的。因此，为了更好的理解这些动物在森林恢复与更新中的作用，也为这些物种及森林的保护制订更全面有效的保护行动计划，希望有更多的热带生物学家在热带地区开展相关研究。

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defecation micro-sites, their role as seed-dispersers is significant in maintaining and establishing the floristic diversity and species composition of forested habitats.

However, these animals are not well protected by either local forest managers or local residents in forest areas of China. They are often hunted, for their skins and meat. Their population is thus declining. Especially after the outbreak of SARS, a new round of increased illegal hunting and trade is threatening the survival of these widespread species. Conserving these “common” animals, and retaining their role in forest recruitment and regeneration, will need further efforts from researchers, as well as concern and engagement from other sectors of the community.

This study is the first systematic report of frugivory and seed dispersal by several sympatric frugivorous carnivores in a subtropical forest, where fruits are abundant in summer and autumn and very scarce during other seasons. Although classified as a carnivore, fruits were their primary food source in autumn and intact seeds were frequently defecated. In tropical areas, where they are also naturally common, fruits are available throughout the year, but so far no systematic dietary studies examining their potential as seed dispersers in these habitats have been published. Therefore, complementary studies in tropical areas are called for, in an effort to gain a more complete understanding of frugivory and seed dispersal by frugivorous carnivores and develop informed conservation measures for them.

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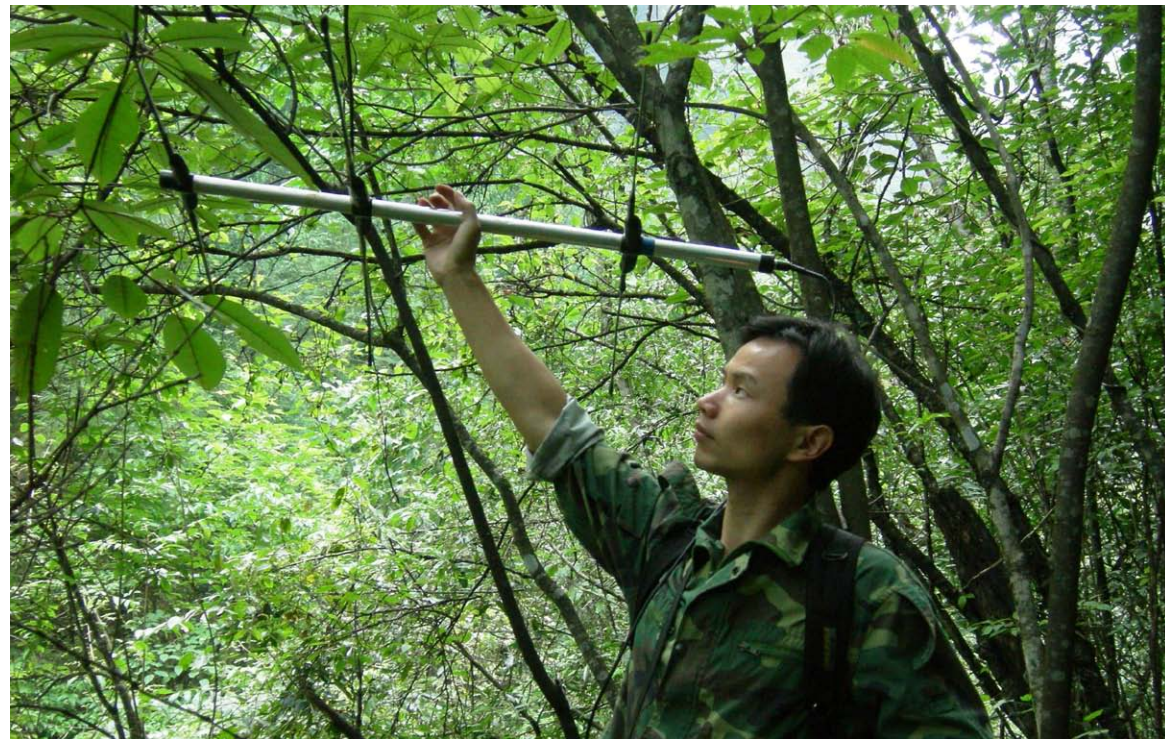
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01 香港细辛是一多年生的爬
行草本，具肉质的根状茎和心
形的叶子。
Hong Kong Asarum is a
perennial creeping herb with
fleshy rhizome and heart-
shaped leaves.

02 香港细辛是香港独有
种，多生长在多石、潮湿的
疏林下。
Hong Kong Asarum grows
on stony moist soil under
the canopy. It is an endemic
species to Hong Kong.

03 香港细辛的花。花瓣合生
成筒状，可以困住来采蜜的小
昆虫以助传播花粉。
Flower of Hong Kong
Asarum. The perianth forms
a tube which traps insects for
pollination.

* 所有相片由由吴英婵摄
All photos by Angie NG
(angiang@kfbg.org)

香港细辛(Asarum hongkongense)

一幅北极熊一脸无助地站在浮冰上的照片曾令不少人
为之动容，也活生生地展现了全球暖化给动物带来的
恶果。但是大家有没有想过其实不少植物也同时受到
全球暖化的影响，只是因为植物不能移动而默默地承
受着这些恶果。在热带地方，受影响最大的相信是适
应在较凉快的高山地方的植物，尤其是分布狭窄的植物
。香港细辛便是一个好例子。

分类

香港细辛属于马兜铃科细辛属。马兜铃科的花大都样
子怪怪的和有”臭味”的，用以吸引细小的蝇类作为
它们传播花粉的媒介。香港只有马兜铃属和细辛属，
而细辛属只有香港细辛一个原生种。

形态特征

多年生的草本植物，具肉质的根状茎，全株有辛味。
叶子近革质，卵状心形或卵形，长6-11厘米，宽
5-8厘米，密被缘毛，两面无毛，上面光亮。叶柄长
12-30厘米。叶脉基出，5-7条。花单生，坛形，紫绿
色，有短梗。花被筒阔卵形或近球形，内具隆起纵向
瘤状皱纹，檐部开展成3裂，裂片阔卵形；雄蕊12，花
柱6，顶端2裂。果为蒴果，并不常见。花期冬春季。

分布及生境

此种自1990年发表后，并未在其它地方发现，也就
是说此种是香港独有的。就算是在香港的原生境，其分
布也相当狭窄。到目前为止，只见于大屿山，在海拔
500-800米高的山坡灌木林和疏林下，生长于多石、
潮湿、排水良好的泥土中。

用途

细辛是常用的中药，有止痛散寒的功用。传统中药
是用细辛（*Asarum sieboldii*）的，但香港细辛也有此功
能，只是辛味较淡，药性较弱。但千万不要乱服因为
细辛中含有的马兜铃酸可引致肾衰竭。

状况及面对的威胁

香港细辛因为稀少和珍贵，在中国境内被列为极危。
此种生长在郊野公园内因而受到保护。人为的破坏虽
少，但是因为气候变化带来的影响却无形地威胁着它
的生存。按现时的碳排放量，21世纪末香港的气温便
可能会平均上升3.5度。到时如果植物想保持现有生
境的温度，只好向高海拔生长。根据每上升1000米，
温度会下降6度的规律，如果上升3度的话，植物（还
有相关的授粉者和种子传播者）便需上移500米。在
香港来说，那些只生长在500米以上的植物将无处可
逃，面临灭绝，因为香港最高的地方——大帽山也不
过是957米。分布狭窄而生长在高海拔的香港细辛可
是前景坎虞前了。如果香港细辛从香港它唯一的生境
消失，也就是说它将从此消失于地球的版图上。

放眼世界，香港细辛只是冰山一角，还有更多其它的
物种，甚至有些是未为人知的物种，也在默默承受着
全球暖化的后果，甚至可能成为气候变化的牺牲品。
你会否为自己的高碳生活而感到丝毫内疚呢？你有否
想过自己可以帮忙解决这问题呢？

(撰文：吴英婵angiang@kfbg.org)

Hong Kong Asarum (Asarum hongkongense S.M. Hwang & T.P. Wong Siu)

Many people have been deeply moved by a picture showing
a polar bear standing helplessly on a small floating ice cube.
This picture symbolises the disastrous consequences of global
warming for animals. But have you ever thought that many
plants silently face similar disaster, just because they aren't
mobile? In tropical areas, the most likely species to be affected
are those adapted to cooler montane climates, and with narrow
distributions. Hong Kong Asarum (*Asarum hongkongense*) is a
good example.

Taxonomic position

Hong Kong Asarum is in the genus *Asarum* of the family
Aristolochiaceae.¹ Most flowers of Aristolochiaceae have
unusual shapes and a stinking smell attracting small flies as
their pollinators. In Hong Kong there are two genera in the
family, *Aristolochia* and *Asarum*. Hong Kong Asarum is the
only *Asarum* species native to Hong Kong.

Description

Hong Kong Asarum is a perennial herb with a fleshy rhizome,
and strong acrid odour. The leaves are slightly leathery, ovate-
heart-shaped or ovate, 6-11 cm long and 5-8 cm wide; the
margins are densely ciliate, glabrous on both surfaces, and
glossy above. The petioles are 12-30 cm long, and there are
5-7 basal veins. Flowers are solitary, campanulate and purplish
green, with short pedicels. The perianth tube is broadly ovoid
or subglobose, with longitudinal wrinkles inside; the limb
above the tube is 3-lobed and broadly ovate; there are 12
stamens and 6 styles, with a bifid apex. Capsule fruits are not
commonly seen. It flowers in winter and spring.

Distribution and habitat

The species has not been found outside Hong Kong since
its description in 1990; in other words it is endemic to
Hong Kong. Even in its natural habitat in Hong Kong, its
distribution is very restricted. Up to now, it has been found

only on Lantau Island, under thickets and thin forests on hill-
slopes at 500 m to 800 m where the soil is stony, moist and
well-drained.

Uses

Asarum is a commonly used Traditional Chinese Medicine
which can relieve pain and dispel ‘coldness’.⁴ Wild Ginger
(*Asarum sieboldii*) is traditionally used. Hong Kong Asarum
is believed to have similar functions but with a weaker aroma
and hence weaker medical efficacy. Asarum should not be
taken without prescription since the aristolochic acid it
contains can lead to severe kidney failure.

Status and threats

Due to its rarity and some collecting pressure Hong Kong
Asarum meets “Critically Endangered” criteria,^{2,3} though
has not been officially assessed. All known populations of
the species are now protected inside country parks, reducing
the impact of illegal collection and habitat destruction. But
although direct human threats are not severe, the invisible
threat from climate change could threaten its survival. If we
maintain present carbon emission levels, the mean temperature
in Hong Kong is likely to increase by 3.5°C by the end of the
21st Century.⁵ Plants, and their pollinators and dispersers, will
have to migrate upwards to stay in habitats with temperatures
similar to the present. According to the rule that temperature
drops 6°C for every 1000 m in elevation, species will have
to move upward by 500 m for a rise of 3°C. In Hong Kong,
plants confined to 500 m or higher would have nowhere to
escape and face extinction, since the highest place in Hong
Kong is only 957 m. Hong Kong Asarum is doomed by such
a scenario.

Globally, Hong Kong Asarum is the “tip of the iceberg”.
Many other species, some unknown to us, are silently being
impacted by global warming, and some are disappearing. Only
by addressing our high carbon lifestyle can we save them.

(Written by Angie NG angiang@kfbg.org)

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鹦哥岭树蛙

鹦哥岭树蛙是我们2003年对海南鹦哥岭的大片未受保护的森林进行本底调查时才被发现的。当时，我们在马域岭海拔1300米原始林下的低矮植物上发现了两只成体。随后我们在该区进行了多次野外调查，亦只多找到两只，但发现一个新的分布点——鹦哥咀海拔1550米处。我们咨询了向导和护林员，是否曾见过或认识这种蛙，他们都不认识。这进一步显示鹦哥岭树蛙分布窄、数量少。事实上，在其它林区的调查，亦从来没有找过这种蛙。

鹦哥岭树蛙是中型蛙类，雄蛙体长43毫米左右。背部通常是青绿色，但能变成棕色或暗绿色，估计这变色的技能可帮助它们融入不同的背景，起到保护色的作用。树蛙趾间的蹼和大腿内侧为红色，只在跳跃时，才会显露出来。这一闪而过的夺目色彩，可令天敌大吃一惊，助它逃出生天。

繁殖期，雄蛙会在雨季临时积水的小水池附近鸣叫，而据信是这种蛙的暗绿色卵泡，亦曾被发现挂在这些小水池上面的植物上。除了零星的观察外，我们对这种蛙所知甚少，甚至连它们的蝌蚪也不曾发现。

那么，这一住在高山上的物种会受气候变化影响吗？鹦哥岭树蛙是一种外温动物，亦即我们所称的冷血动物。它们不能制造热能，来保持一个稳定的体温。而它们基本的活动，如觅食和繁殖，都会受所处环境的温度所影响。而住在热带的陆栖外温动物，对温度变化的承受能力则更差。

它们不能够像候鸟那样迁徙到温度合适的地方去，要留在生理上适应的温度范围，它们就只能往海拔更高处去。

我们知道，每爬高100米，气温便会下降0.6℃。科学家预测，如果人类继续现有的生活和做事方式，华南地区的气温会在60年后上升4℃。这就意味着，鹦哥岭树蛙要活下去，需在未来60年往上迁移600至700米。但这事不可能发生，因为鹦哥岭最高峰只有1812米，那是他们所能攀爬的极限。

除了变暖外，气候变化亦会令极端的天气更为严重和频繁。这很可能会降低这种蛙的繁殖成功率。鹦哥岭树蛙通常在季节性、临时性的小水体里繁殖。如果遇上长期的干旱，蝌蚪赖以生存的繁殖地会干掉，复巢之下的蝌蚪亦会全军覆没。相反，蝌蚪若是在遇上异常大雨时，也有被冲走的危险。

当然，如果气候变化真如上面预测的那般，那么我们的粮食供应以至社会都会遭受到极大的打击，到时不会有很多人关注这一不为人熟悉的物种的灭亡。但鹦哥岭树蛙本身，却可以被视作一种对生态变化作出指示的生物（或晴雨表）。它的未来，像所有生存在地上的物种（包括人类）一样，取决于我们当今对气候变化危机的重视程度。要改变还不算太迟，现在我们还有时间修正不可持续的生活习惯。但是，那些蛙却已经越来越接近它们的“峰顶”（极限）。

（撰文：刘惠宁 mwnlau@kfbg.org）

Yinggeling Tree Frog

The Yinggeling Tree Frog was only discovered in 2003, during the baseline survey of the large tract of unprotected forest in the Yinggeling area. At that time two adults were found on low vegetation in primary forests at 1300 m in the Mahuoling area. Despite much subsequent field work in Yinggeling, only two more individuals were found and one more locality added, at 1,550 m in Yinggezui. We have asked local guides and wardens about this frog and even they are not familiar with this species, further indicating that it is rare and restricted. Previous surveys in other good forests on Hainan have failed to find this beautiful frog.

It is a medium sized treefrog and males are about 43 mm in length. The upper side is usually grass green in colour but it can change to brown or dark green, probably to blend with the background. Toe webbing and the insides of the thighs are reddish, giving a flash of colour that might startle a predator when the frog jumps. Adult males call near seasonal rain-fed pools in spring, and moss-coloured foam nests, believed to belong to this species, have been seen hanging on vegetation above such pools. Besides these observations, little is known about the species and its tadpoles have never been found.

How will this high-altitude species be affected by climate change? Being an ectothermic or ‘cold-blooded’ species, such that it cannot generate body heat to maintain its body temperature, its basic activities like feeding and reproduction are strongly influenced by the environmental temperature. Tropical terrestrial ectotherms actually have narrower thermal tolerance and are more susceptible to warming. The Yinggeling Tree Frog will not be able to migrate to areas of more suitable temperatures. To remain in its physiologically adapted temperature range, it will have no choice but to move higher up the mountain as temperature increases. A climb of

100 m uphill corresponds to a drop of 0.6℃. A prediction for South China is that the air temperature will increase 4℃ in the next 60 years if we continue doing things as usual. In this scenario, the Yinggeling Tree Frog will have to move up 600 to 700m in altitude over the next 60 years! That is not possible as the summit of Yinggeling is just 1811m.

In addition to warming, climate change will cause more frequent extreme weather events. This is likely to affect the reproductive success of the Yinggeling Tree Frog as it breeds in small, seasonal rain-fed pools. Tadpoles will perish if the breeding pool dries up during severe dry spells or they may be washed away during exceptionally heavy rains.

Of course climate change of this projected pace would cause massive disruptions of human food and society; few would notice the slide to extinction of such little-known species. The future of Yinggeling Tree Frog, like all other life on earth including humans, depends on how seriously we treat the climate change crisis now. There is still time to change our unsustainable life styles, but the frog is getting close to the summit.

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保护，碳、向可持续生活过渡

Conservation, carbon and transition to sustainability

向可持续生活过渡，必须建立在保护生命的基础上，包括保护生物多样性和生物圈。自然保育是广泛实现可持续性的支点。如果生态系统失去了多样性，不再正常的运作，就无法长久地为人类生命和生活质量提供赖以存在的生态服务。一个连生态系统服务功能，都寻求用科技合成方法来取得的世界，不单单是科幻小说，也是可怕的人间炼狱。

在这场讨论中最紧要的问题是，我们能否在全世界都锁定在不可持续的发展道路的背景下，真正做到生物多样性的保护。《迈向可持续》¹一书认为这是不可能的。生物多样性保护和可持续理念必须双向整合。如果生物多样性是可持续生活的基础，那么自然保护就不可以和可持续性的议题抽离开来。二十世纪的大多数时期，现代生物多样性保护运动一直通过保护区的形式，将人类和发展与自然分隔开。那就是环保人士接受了不断扩张的世界经济将无可避免地对自然环境带来破坏的现实，与此同时，他们也努力确保一些最重要的地方受到保护。在这一点上，他们是取得了一些成绩的：世界上有12%的陆地面积受到了保护。但这是一种浮士德式交易：任由人类对生物圈需求的不断扩大，生物多样性所受的影响便会增加，而气候变化也会越来越剧烈。我们再也不能把生物多样性的保护，作为独立于可持续性广泛讨论之外的内容了。

那么，如果要保护好生物多样性，我们在可持续生活上到底应该做些什么？最重要的是，我们必须支持更广泛地向可持续生活过渡。我们要能够解释，如何才能建立能维持生物多样性和向地球公民提供高水平福祉和快乐的经济体。我们还需要制定有效的保护战略，创造一个包含人类在内的、生物多样性丰富的世界，而不是一个被无生命人文景观所包围、内部却只有一些充满生物多样性的“孤岛”的世界。人们普遍认识到，单靠分隔的、面积细小的保护区是无法实现保护目标的；扩大不让人进入保护区的面积也不会得到周边社区或国家纳税人的支持。2003年德班协定指出：保护区应为人提供‘超越地图边界、国家界限，跨社会、性别和世代’的好处²。这就要求保护和可持续利用必须紧密地结合起来(<http://www.iucn.org/themes/ssc/susg/>)。

自然保护运动必须向公众证明，生物多样性是所有人的，不分贫富。我们对贫穷和环保之间复杂联系的了解越来越深了^{3,4,5}，但是，环保必须和我们对生态系统健康和人类福祉的关注紧密联系起来。我们的保护工作，必须和人民对自然的认识联系起来，比如：自然为我们提供了食物、物品、安全洁净的环境、美与奇，当然还有生计和工作。如果保护工作能够针对这些议题，那么就是满足人类的需求而不是抑制他们了（正如批评者常常抱怨的那样）。

我们应积极参与迈向可持续的讨论，寻觅出成功的经

济体模式是怎样的，如果这种经济体不是建基于大量能源和物质消耗、污染的工厂、机场、和堵塞的高速公路，以及向国外出口不能持续的消费需求。我们必须界定“可持续性”在发展中经济意味着什么？如何可以做到？还应该协助制定策略，让人们有机会过一种有追求和希望的生活，这种生活模式同时亦支持一个生机盎然的自然。

因此，正如生物多样性对可持续性至关重要一样，可持续生活是实现保护不可或缺的一环。我们能在一个不可持续的地球上实现生物多样性保护么？答案是：绝对不行。如果那样做的话，我们将不得不把生物多样性放进箱子里保护起来，正像我们把蝴蝶钉在鳞翅类学家的抽屉里来保护一样，而我们的保护区也会被一个遭蹂躏的世界所包围，逐渐变得贫瘠失色。

环保工作者必须面对迈向可持续性的挑战：我们的工作单位、个人生活、购物和渡假模式，还有我们给贫穷地区社群所提供的方法，都必须符合可持续的、在一个地球的限制下生活(http://www.panda.org/about_wwf/what_we_do/policy/one_planet_living/index.cfm)的挑战。认为我们可以在一个隔离的泡沫中操作而让其它环保运动来解决消费和世界经济问题是一个极为不现实的幻像，这和典型的企业和消费者的幻想：“一切都会好起来”一样。很可能的是，我们和合作伙伴共同保护的森林能储存的碳远远超过我们做这工作时所排放的。但同任何公司或政府（当然还有大学）一样，我们需要证明我们说的没错。这便需要审计我们的工作，并将结果提供给利益相关者，也包括批评者。

大自然，经济和社会是紧密相连的：我们很清楚这一点。因此，作为环保工作者，在我看来，我们没有其它选择。我们必须使‘过渡至可持续生活’成为我们为自然而战的核心，正如我们把自然作为推动可持续性的中心一样。如果不这样做，便是以叶障目、自欺欺人，最终是咎由自取、失败收场，如果不这样做，肯定是不道德的。

本文节选自William M. Adams, 2008, *Oryx* 42(4):469-470. · 已获作者授权，在此表示感谢。 <http://journals.cambridge.org/action/displayIssue?jid=ORX&volumeId=42&seriesId=0&issueId=04>

参考资料：

¹ Adams SM and Jeanrenaud S, 2008. *Transition to Sustainability: Towards a Diverse and Humane World*. IUCN, Gland, Switzerland.

² IUCN, 2005. *Benefits Beyond Boundaries. Proceedings of the Vth World Parks Congress*. IUCN, Cambridge, UK.

³ Redford KH, Levy MA, Sanderson EW and de Sherbinin A, 2008. What is the role for conservation organizations in poverty alleviation in the world's wild places? *Oryx* 42: 516-528.

⁴ Roe D, 2008. The origins and evolution of the conservation-poverty debate: a review of the key literature, events and policy processes. *Oryx* 42: 491-503.

⁵ Walpole M and Wilder E, 2008. Disentangling the links between conservation and poverty reduction in practice. *Oryx* 42: 539-547.

A transition to sustainability must be based on the protection of life: biodiversity and biosphere. The conservation of nature is the fulcrum for wider change towards sustainability. Without functioning, diverse ecosystems the services on which both human life and quality of life depend will not endure. A world where techno-science seeks to deliver ecosystem services through synthetic processes is not only science fiction but also a grim environmental dystopia.

The burning question for conservation in this debate is whether we can deliver biodiversity protection within the context of a world locked on an unsustainable development path. Transition to Sustainability¹ argues that we cannot. The need to integrate biodiversity and sustainability cuts both ways. If biodiversity underpins sustainability, so conservation cannot be separated from a wider sustainability agenda. For most of the 20th century the modern conservation movement tried to protect nature away from people and development, in protected areas. In effect, conservationists accepted that damage to nature from the expanding world economy would continue while they fought to ensure that the most precious areas were protected. In this limited aim there has been some success: 12% of the terrestrial globe lies in a protected area of some kind. But this was a Faustian bargain: expanding human demands on the biosphere left wider impacts on biodiversity and climate change unchecked, with disastrous effects. It is no longer acceptable to treat biodiversity conservation as if it were independent of wider debates about sustainability.

So, what does a commitment to sustainability involve for biodiversity conservation? Most importantly, we must support the wider changes involved in the transition to sustainability. We need to be able to explain how to build economies that sustain biodiversity and deliver high levels of welfare and happiness to the earth's citizens. Conservation strategies must be crafted that create a biodiverse world that includes people, not a world of biodiverse enclaves in lifeless human landscapes. It is widely recognized that protected areas cannot achieve conservation's aims as small high biodiversity islands. Nor will calls for exclusive reserves necessarily achieve political support from surrounding communities or national taxpayers. The 2003 Durban Accord argued that protected areas should provide benefits 'beyond their boundaries on a map, beyond the boundaries of nation states, across societies, genders and generations'.² This demands close integration of protection and sustainable use (<http://www.iucn.org/themes/ssc/susg/>).

The conservation movement must demonstrate that biodiversity is for rich and poor alike. The complex links between poverty and conservation are increasingly being teased out^{3,4,5} but conservation must also become more strongly integrated with concerns about wider ecosystem health and human well-being. We need to base our work in what people see nature doing for them, for example providing food, products, a safe and clean environment, beauty and wonder, and of course livelihoods and jobs. If conservation can address such issues, it will be meeting human needs and not (as its critics so often complain) thwarting them.

We need to contribute to debates about the transition to sustainability, working out what successful economies look

like if they are not built on vast energy and material demands, polluting factories, airports, jammed freeways, and the export of unsustainable consumptive demand overseas. We need to define what sustainability means in developing economies, and how to achieve it, helping devise strategies that give people the chance to lead lives of aspiration and hope that also sustain living nature.

So, just as biodiversity is critical to sustainability, sustainability is a vital issue for conservation. Can we deliver biodiversity protection in an unsustainable world? Absolutely not, or we will end with biodiversity 'saved' by being shut into boxes like butterflies pinned in a lepidopterist's drawer, our protected areas just impoverished enclaves in a ravaged world...

Conservationists cannot be exempted from the challenge of sustainability: our organizations, our private lives, our shopping patterns, our holidays, and the solutions we offer to impoverished communities in poor countries all have to meet the challenge of sustainable one-planet living (http://www.panda.org/about_wwf/what_we_do/policy/one_planet_living/index.cfm). The idea that we can operate in a bubble while the rest of the environmental movement addresses issues of consumption and the world economy is a cruel illusion, just another version of the standard corporate and consumer fantasy that all will be well. It may well be that the carbon stored in the forests we help our partners protect far outweighs the carbon we burn doing it. But like any corporation or government (or university of course) we need to prove it is so. We need to audit our work, and make the results available to our stakeholders, including our critics.

The natural world, the economy and society are connected: we know this. Therefore as conservationists it seems to me that we have no option. We have to make the issue of a transition to sustainability central to our fight for nature, just as we make nature the centre of the push for sustainability. Anything else is wilfully tunnel-visioned and ultimately self-defeating. Anything else is, surely, simply immoral.

Excerpted with kind permission from an article by William M. Adams, 2008, *Oryx* 42(4):469-470. <http://journals.cambridge.org/action/displayIssue?jid=ORX&volumeId=42&seriesId=0&issueId=04>

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¹ Adams SM and Jeanrenaud S, 2008. *Transition to Sustainability: Towards a Diverse and Humane World*. IUCN, Gland, Switzerland.

² IUCN, 2005. *Benefits Beyond Boundaries. Proceedings of the Vth World Parks Congress*. IUCN, Cambridge, UK.

³ Redford KH, Levy MA, Sanderson EW and de Sherbinin A, 2008. What is the role for conservation organizations in poverty alleviation in the world's wild places? *Oryx* 42: 516-528.

⁴ Roe D, 2008. The origins and evolution of the conservation-poverty debate: a review of the key literature, events and policy processes. *Oryx* 42: 491-503.

⁵ Walpole M and Wilder E, 2008. Disentangling the links between conservation and poverty reduction in practice. *Oryx* 42: 539-547.

《森林脉搏》投稿须知

Author Guidelines for Living Forests

范畴

《森林脉搏》由嘉道理农场暨植物园中国项目出版，每年两期，为致力从事华南地区自然保育人士报导环保资讯，提供讨论及交流渠道，借以启发读者。《森林脉搏》的内容题材包罗森林和生物多样性各个保育范畴，尤以改善资源管理与减少威胁为报导主题。凡从事相关保育的工作者、森林管理人员、科研人员及顾问等都欢迎投稿。

稿件类别

1. 特稿及短文

稿件须连同相片一并递交，特稿及短文分别以1,200及500字为限，题材务必与华南地区的保育事项有关，例如：

- 影响该地区生物多样性的问题
- 保护区管理
- 濒危物种、类群或生态系统组成部份的野外考察或资料整理
- 生态修复及生物多样性保育的项目与个案研究
- 相关公约、法律与政策的推行与实施
- 森林及野生生物资源利用之重要性及影响

2. 来函

回应前期刊登文章之稿件以少于500字为宜。

3. 资讯速递

以报导最新保育动态或重要消息并且未经刊载为合，亦欢迎提供关于经费来源信息与相关会议、培训班等资料。来稿以少于500字为宜。

4. 新闻焦点

根据已印刊的资讯及其他可靠报导来源，以少于200字撮要有关华南及毗邻地区的森林与物种保育资讯。

5. 出版刊物

简单介绍近期出版的书籍、报告与书评。诚邀作者及出版社投寄书刊供编辑评述，亦欢迎投寄对近期出版书籍的书评，建议进行书评前先谘询本刊编辑的意见。

稿件格式

有关稿件的一般格式，可参阅近期出版的《森林脉搏》。来稿中、英文皆可，双语版更佳。除可递交打印稿外，作者亦可把文件储存作WORD或RTF档案以电邮形式提交。封页须标明题目、作者之邮政及电邮地址全写，及其他共同撰稿的作者姓名和地址。此外，稿件须顺序编码，图表应力求简洁易懂，标题恰当。首次提及的物种，应按其科学名称书写，并在调查方法内注明分类命名法之采用准则。

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作者可透过邮寄或电邮方式递交文稿（地址如下）。付寄邮件必须声明(1)文稿并未公开发表或投寄他处（获准翻印的文章除外），及(2)投寄稿件前经已取得所有作者同意。如文稿内容与其他已文付印刷或正在整理的刊物内容有重迭，应注明并有关稿件一并递交。随特稿及短文应附上不少于两张JPEG格式的照片（彩照更佳），标题则须附注于文稿内。另欢迎作者投寄一幅或多幅高素质的彩色幻灯片或照片，以作甄选本刊封面照之用。

审阅及校对

来稿须经编辑委员会审阅，如有需要，本刊会谘询其他专家之意见。来稿一经接纳，为使内容更明确清晰，本刊或会进行修改。除非来稿经大肆修改、加插资讯或需澄清，否则本刊编辑不会就其他修改另行通知作者。

其他

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Scope

Living Forests magazine is published twice a year by the China Programme, Kadoorie Farm and Botanic Garden. It aims to inform, inspire and serve those dedicated to nature conservation in the South China region, providing a platform for discussion and information exchange. *Living Forests* publishes material on all aspects of forest and biodiversity conservation, particularly with the potential to improve management and reduce threats. We welcome submissions by forest managers, researchers, advisers and practitioners with related objectives.

Content

1. Articles

Feature articles (1,200 words) and *Short articles* (500 words), with photographs, are invited on topics relevant to the magazine's focus in South China. These include, but are not limited to:

- Issues affecting biodiversity across the region
- Considerations and guidelines for effective management of protected areas
- Field research and reviews on the status and distribution of threatened species, taxonomic groups or ecosystem components
- Initiatives and case studies for ecological restoration and biodiversity conservation
- The working of relevant conventions, laws and policies
- Research on the importance and impacts of forest and wildlife utilisation.

2. Letters

Contributions (generally <500 words) in response to material published in previous issues of the magazine.

3. Notices

Items (generally <500 words) concerning recent developments in conservation or important announcements, other than from published sources. Other items of interest include news of the availability of grants or funding opportunities, and announcements of relevant meetings, workshops and conferences.

4. In the News

Concise reports (<200 words) on news of forest and species conservation interest in South China and surrounding areas, based on published sources including reputable websites.

5. Recent Publications

Brief announcements of new publications and book reviews. Authors and publishers are invited to send publications to the Editor for potential review. Reviews of recent books are also welcomed; prospective reviewers are advised to consult the Editor in advance.

Preparation of manuscripts

Authors are advised to consult a recent issue of *Living Forests* for general style. Contributions can be in English or Chinese or (preferably) both. Electronic submissions in either Word or Rich Text format are acceptable. The cover page should contain the title, corresponding author's full postal and email address (as applicable) and names and addresses of any additional authors. All pages should be numbered consecutively. Tables should be self-explanatory and each with an appropriate caption. The first time a species is mentioned, its scientific name should follow. Where necessary, the basis used for nomenclature of taxa should be indicated in the methodology.

Submissions

Manuscripts should be sent either by post or email to the Editor (address below). A covering letter or email note must confirm that (1) submitted manuscripts have not been published or submitted for publication elsewhere (or, in exceptional circumstances, that permission for republication has been acquired), and (2) all authors have agreed to the submission of the manuscript. If there is overlap with other publications, including any in press or in preparation, this should be stated and the papers concerned sent to the Editor. For articles a minimum of two (preferably colour) photos in JPEG format and captions should be attached separately with the body text. Authors may also submit one or more high quality colour slides or photos related to their submission for consideration as a photograph for the front cover.

Review and editing

Manuscripts are subject to review by an editorial Committee; if appropriate external reviewers may be consulted. After acceptance, manuscripts may be edited to enhance clarity; such editing will not be sent to the author unless substantial changes have been made or additional information and clarification is needed.

Others

Contributors will receive two free copies of the issue in which their paper is published. The copyright, upon acceptance of an article, will be transferred to the Kadoorie Farm and Botanic Garden. To contact us, please write to:

Editorial Committee, *Living Forests*
China Programme Coordination Office
Kadoorie Farm and Botanic Garden
Lam Kam Road, Tai Po, N.T., Hong Kong SAR

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