



## **Australian Academy of Science**

### **Sino-Australian Workshop on the Management of Grassland-Livestock Systems and Combating Land Degradation in Northern China**

#### **Background**

Following an initiative of the Chinese Embassy, a meeting on 22 September 2005 between the Embassy, AusAID, and other relevant Australian government departments was held to discuss a proposal from China's Ambassador to Australia, Madam Fu Ying for a collaborative program to resolve issues affecting the long-term sustainability of the extensive grasslands in China. AusAID agreed to contribute funding for a small scientific meeting to be held at the Australian Academy of Science, Canberra, on 6-7 December 2005.

The Australian Academy of Science agreed to work with the Chinese Embassy, and in liaison with AusAID, develop a suitable agenda and list of participants for the meeting. The Australian convenor of the meeting was Dr TJ Higgins, a Fellow of the Academy, Chair of the Academy's National Committee for Plant and Animal Science, and Deputy Chief, CSIRO Plant Industry.

Academy representatives met with the Chinese Ambassador to Australia, Her Excellency Madam Fu Ying and Professor Tang Huajun of the Institute of Agricultural and Resource and Regional Planning, Chinese Academy of Agricultural Science, in Beijing on 9 October 2005, to further discuss the aims and format of the meeting. Professor Tang was selected as the Chinese convenor of the meeting.

The objectives of the meeting were to:

- Enhance communication and cooperation between Chinese and Australian scientists and experts.
- Provide a forum for identifying and discussing the fundamental causes of grasslands degradation in China and for sharing the lessons learned from efforts to fight it.
- Identify gaps and opportunities for new research and development programs seeking to address the problem.

The Canberra meeting would also discuss the value of a proposed subsequent workshop on grasslands management to be held in Beijing in 2006, at which objectives and proposed outcomes would be refined and used as the foundations for a cohesive set of proposals seeking financial support from donors. At such a workshop AusAID agreed to share the experience and findings of its current grasslands projects.

## **Project**

Given the short time frame for organisation of the meeting, the Academy, CSIRO and AusAID, kept frequent contact and also kept the Chinese Embassy up-to-date on developments. The Academy, in conjunction with the organising committee, led by Dr Higgins:

- (a) Developed a suitable list of Australian and Chinese scientists who participated in the meeting, in liaison with the Chinese Embassy and AusAID (**Attachment 1**);
- (b) Developed an agenda for the meeting, in conjunction with AusAID, and prepared relevant meeting materials (**Attachment 2**);
- (c) Organised logistics for the meeting – including travel and accommodation for participants; catering for the meeting and other administrative duties as required;
- (d) Hosted the meeting on 6-7 December 2005 at the Australian Academy of Science and produced and distributed a set of proceedings to participants, AusAID and the Chinese Embassy (**Attachment 3**); and
- (e) Hosted a one-day site visit on 8 December in NSW and the ACT for participants of the meeting, in order to illustrate grasslands management in Australia (**Attachment 4**).

The meeting was opened by Dr Jim Peacock, President of the Australian Academy of Science, Dr TJ Higgins and Madam Fu. Mr Liu Liangui, Vice Director, Grassland Supervision Centre, Chinese Ministry of Agriculture, spoke on behalf of the Chinese delegation.

## **Outcomes**

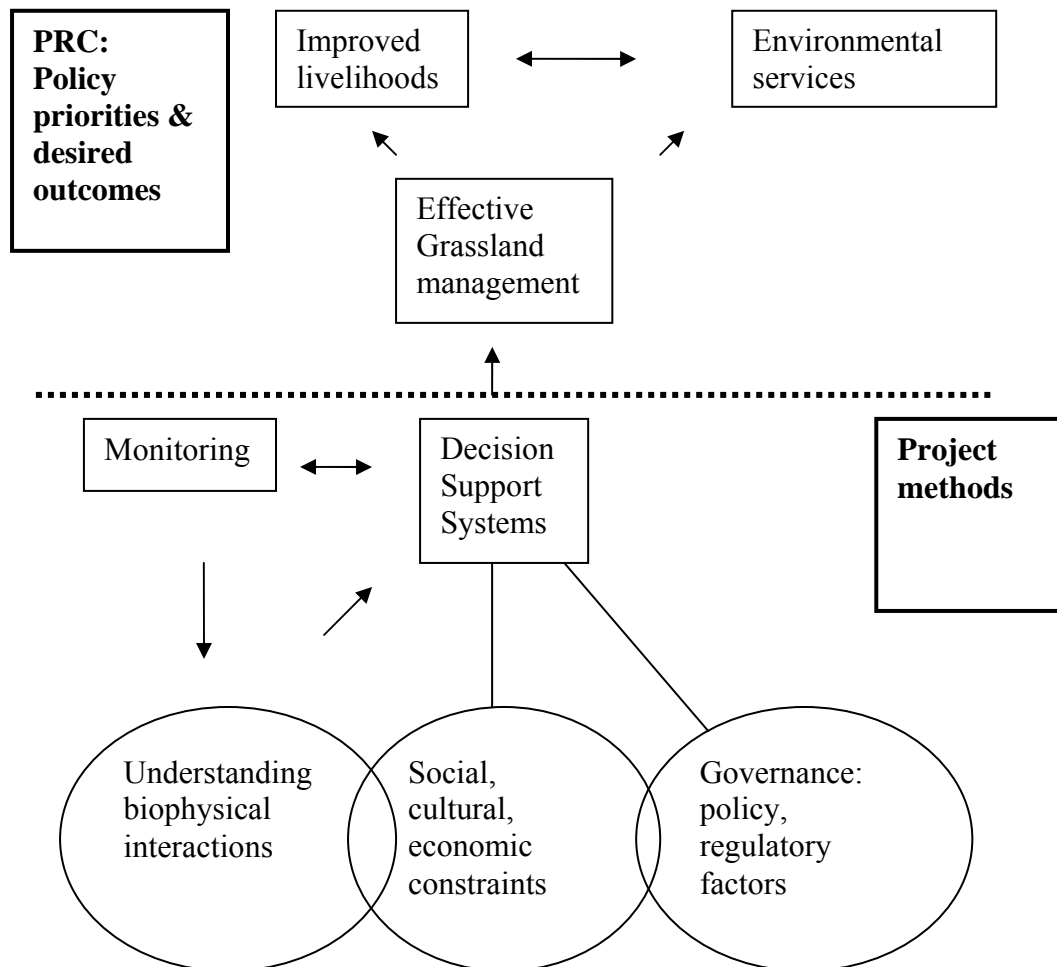
In her opening address, the Chinese Ambassador Madam Fu suggested that the key issue in grasslands management that should be addressed was the estimation of sustainable carrying capacity. This should also take account of economic policy and social issues as well as environmental sustainability. To achieve the objective it was considered essential to have all levels of government in China involved and for the work to extend beyond pilot studies.

The challenge is significant as the issues in grassland management are diverse and the government agencies numerous. Solutions based solely on technology will not work. Nevertheless, a strong scientific approach to the issues is a vital component as it will provide the basis for more informed decisions at both the central and regional government levels and by individual households. It will be essential to integrate new projects with current grassland research and development programs already underway in China. A whole systems approach is essential to achieve an integrated approach to natural resource management (NRM) and must link policy, social and environmental issues. Rural communities must be included in implementing a regionally sustainable carrying capacity for livestock and develop an understanding of the link between poverty and environmental degradation. Regional demonstration sites are seen by the central government as key focal points for achieving adoption of recommendations that will emerge from the proposed collaboration. It will be essential that these demonstration sites provide data to initialize parameters in models used so the information can be extrapolated to other grassland users in the region.

PowerPoint presentations used at the workshop are available in the attached CD-ROM.

A framework was negotiated to highlight the key issues for an effective grasslands management strategy (Figure 1). Its structure helps to place research priorities in context with government policy, societal needs and research opportunities. The key to success will lie in identification of opportunities with the greatest impact on outcomes for all stakeholders through a fair and sustainable grasslands management policy. Importantly the Chinese delegates considered this framework included appropriate linkages for all the potential financial donors in China.

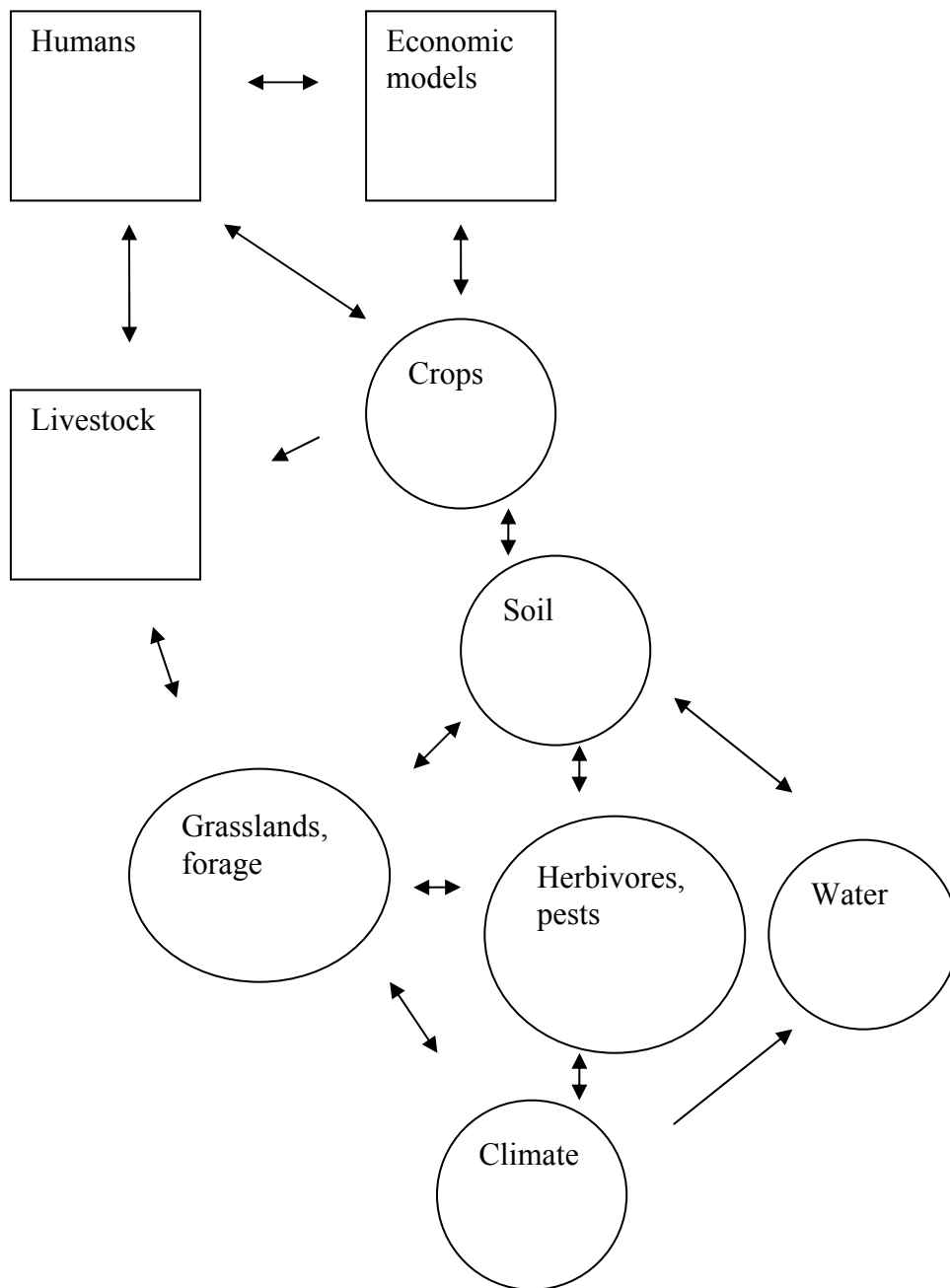
**Figure 1. Key issues in an effective grasslands management strategy**



The framework in Figure 1 is underpinned by the biophysical model outlined in Figure 2. The biophysical model helps to encapsulate current understanding and to identify gaps in knowledge where further research is a critical requirement. The proposed workshop in Beijing will focus on critical research targeted to have maximum impact on the objectives in Figure 1, and will determine the priorities for action. An existing ACIAR project aims to identify data sets for modelling grassland management and will be a keystone for the proposed collaboration.

Four research/development modules have been identified (Table 1). For each of the four key issues, team leaders and a list of potential participants were nominated. In addition, two Australian participants were nominated to provide an integrated picture of what is already known about the utilization of grasslands based on past research and current projects. Also, two team leaders, one each from China and Australia, were nominated to oversee the coordinated development of options by the four teams and to ensure that the discussion papers are prepared in time for a follow-up workshop in Beijing in February/March 2006.

**Figure 2. Biophysical model of grassland interactions**



## **Financial report**

A statement of income and expenditure is attached.

The Academy was pleased to make the Shine Dome available for the workshop at no cost in order to support the bilateral collaboration between Australia and China. Additionally, the Academy, CSIRO and AusAID assigned, at short notice, a number of staff to work on this event to guarantee its success. AusAID was pleased to support the workshop.

## **Acknowledgements**

The efforts of Dr TJ Higgins, Dr John Donnelly, Dr Bob Clements, Dr Xin Xiaoping, Dr Marjorie Sullivan, Michael Hassett, Jennifer Gregory, Nancy Pritchard, Jeanette Mill and Anise Clarke in organising this workshop and preparing this report are acknowledged.

**Table 1. Sino-Australian Grasslands Development Program**

(Note in Item 3 below the dot point with shaded text was not specified at the workshop)

<p><b>1) Identify Environmental Services and off farm impacts</b> Regional planning approach (triple bottom line)</p>		
<ul style="list-style-type: none"> <li>• Carbon storage</li> <li>• Water systems – Catchment Management Planning, water quality ↑</li> <li>• Biodiversity</li> <li>• Tourism</li> <li>• Dust ↓</li> </ul>	<p><b>Team Leaders</b> Lyn Hinds Long Ruijun</p> <p><b>Potential participants</b> Andrew Ash Roger Pech Xin Xiaoping Shi (Dazhao or Dejun) Fiona Bartlett Wang Yongwon Steven Cork</p>	
<p><b>2) Grasslands Monitoring/Simulation Modelling</b></p>		
<ul style="list-style-type: none"> <li>• Remote sensing</li> <li>• Decision Support Systems</li> </ul>	<p><b>Team Leaders</b> Andrew Moore Xin Xiaoping</p> <p><b>Potential participants</b> Graham Donald Chen Zhongxin Tang Huajun John Donnelly Libby Salmon Xing Qi Liang Kengan Lin Jiawen Zhibin Zhang (CAS) Zhao Xinquan</p>	<p>Others who might participate: CSIRO Sustainable Ecosystems CSIRO Mathematical and Information Sciences CSIRO Office of Space Science and Applications Department of Land Information – Centre for Remote Sensing (WA)</p>
<p><b>3) Sustainable Grazing Pressure (all herbivores)</b></p>		
<ul style="list-style-type: none"> <li>• Early lambing – critical thresholds</li> <li>• Feedlotting – animal husbandry, supplementary feeding techniques, resting times</li> <li>• Forage production – agistment (plant improvement)</li> <li>• Diversification/Risk management</li> <li>• Cropping to provide alternative income</li> <li>• Response of grasslands to grazing</li> </ul>	<p><b>Team Leaders</b> Ken Hodgkinson Lu De-Xun</p> <p><b>Potential participants</b> Geoff Auricht Tony Arthur Long Ruijun David Michalk Liu (Liangui or Yongzhi)</p>	<p>Wang Gang David Kemp Warren Kingston Wang Zongli Huang Damin Ron Hacker Zhou Qingping Nan Zhi Bia Wang De Li Han Guodong Han Jianguo Wu Janping Du Guozhen</p>

<b>4) Technology Transfer/ Integrated Ecosystem Management</b>	
<ul style="list-style-type: none"> <li>• Model “farms” (systems) – trial field/research centres demonstration for farmers</li> <li>• Integrated research centres</li> <li>• Community based uptake programs</li> <li>• Community demonstration sites</li> </ul>	<p><b>Team Leaders</b>  Bill Bellotti  Luo Jian</p> <p><b>Participants</b>  Liu (Liangui or Yongzhi)  Gordon King  Noel Haug  Sun Qizhong  Jia Yuefeng  Shi Dejun  Xin You Jun  Chun Liang  Xu Bin  Mao Yushou  Liu Ya Xue  John Taylor  Richard Clark  Sun Hailian  Sam Chittick</p>
<b>5) Integrated picture of what is already underway and known (from past research)</b>	
<ul style="list-style-type: none"> <li>• Teams to develop research opportunities</li> <li>• Draft proposal (R&amp;D program for Grasslands) prior to Beijing workshop</li> <li>• Identify knowledge gaps (\$ gaps)</li> <li>• Draft paper on China/Australia Grasslands Development</li> <li>• Philip Young to communicate with the Asia Development Bank on outcomes and directions</li> </ul>	<p><b>Team Leaders (to deal with first 2 dot points)</b>  John Donnelly  Tang Huajun</p> <p><b>Participants (to deal with last 3 dot points)</b>  Gordon King  Philip Young</p>