



Implications of Rangeland Enclosure Policy on the Tibetan Plateau

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Fundamental, policy-driven changes are transforming China's rangelands in response to a perceived threat of environmental degradation. Having transferred livestock property from state to private ownership over the past two decades, government policy is now encouraging pastoralists to privatise parts of the natural resource, in the form of fenced enclosures. In other areas, the government has asserted its ultimate rights of land ownership and is excluding grazing entirely. These reforms are presented as packages that include incentives for pastoralists to fence pastures, cease moving their animals seasonally, build permanent settlements on the ranges, or emigrate to towns.



Photos previous spread, at right and above: Sheep herding on the Tibetan Plateau; copyright, Ernie Reyes.

Underpinning these policies is the presumption that extensive mobile pastoralism based on communal pasture use is backward and inefficient, and has led to land degradation^{1,2,3,4}. Using a “Tragedy of the Commons” analysis⁵, it is also argued that livestock-owners will take better care of the grazing land if it is privately controlled^{6,7}, or that pastures are so abused that grazing must be banned altogether⁸.

Severe land degradation and desertification on the Tibetan Plateau has been widely noted by Chinese scientists, with overgrazing by livestock usually identified as the principal human factor causing degradation^{9,10,11,12}. Many millions of hectares are classified as desertified to varying degrees, with 20.5 million ha. in the Tibetan Autonomous Region alone categorised in this way⁹. Some Chinese and international scientists have nonetheless questioned the usefulness of enclosure and exclusion as remedies for degradation^{3,8,13,14,15}.

An international, interdisciplinary research project, Range Enclosure on the Tibetan Plateau of China: Impacts on Pastoral Livelihoods, Marketing, Livestock Productivity and Rangeland Biodiversity (RETPEC), is currently investigating the biophysical and socio-economic impacts of policy-driven land use change in China’s semi-arid regions by examining

both the consequences and reasons for the implementation of this land reform process on the Tibetan Plateau.

The reforms that are the focus of RETPEC affect vast areas and millions of people. As a geographical feature, the plateau stretches across the Tibet Autonomous Region of China (TAR) and parts of four adjoining provinces (Qinghai, Gansu, Sichuan and Yunnan). The plateau covers 1.65 million sq. km, by far the most expansive area of alpine grassland in the world, containing diverse vegetation types from desert steppe in the west to moist alpine meadow in the east, across a rainfall gradient from about 100mm to 700mm of average annual precipitation. The plateau accounts for roughly half of China’s rangeland and supports about five million ethnic Tibetan pastoralists and agropastoralists, predominately from China’s minority groups representing some of the nation’s poorest people.

Informing Policymakers

Rangeland reform to address the apparent crisis of overgrazing is being rapidly implemented on the plateau. Scientific research that would inform this process must operate at a



scale that reflects the geographical scope at which administrators and policy makers operate. This research should also provide information in a form useful to policymakers who may not have a technical background, but are nonetheless making decisions with long-term implications regarding the protection and management of rangeland ecosystems and the welfare of millions of people.

RETPEC was designed to meet these practical demands through a combination of interdisciplinary, field-based research, syntheses of existing research findings, and participatory work with pastoral communities, local administrations and NGOs. The project will inform public policy by assessing whether land degradation is ameliorated by the new land tenure and grazing regimes. By investigating the effects of situations in which pastoralists are forced to settle in rural areas or are obliged to leave the rangelands altogether and seek scarce alternative livelihoods in towns, thus creating a rural-to-urban population shift, it will also measure the consequences of sedentarisation on pastoralists' social and economic welfare^{15,16,17,18,19}. The overall purpose of the research is to identify the immediate and long-term environmental, social and economic impacts of policies now being put into practice.

Specifically, RETPEC is investigating the biophysical and socio-economic effects of fenced versus open range grazing management across several major ecological zones in the Tibetan Plateau. The plateau provides a coherent ethnic, historical and geographical entity for comparative research. Across the plateau, enclosure and exclusion are being implemented unevenly, with largely unmeasured consequences^{8,15}. Study areas in Hongyuan County of the Sichuan Province, Machin County of the Qinghai Province, Tienzhou County of the Gansu Province and Nyima County in the Tibet Autonomous Region have been selected to represent four main environmental conditions that characterise the plateau as a whole, namely high vegetation productivity in montane and peatland rangelands, high frigid meadows with medium vegetation productivity and lastly, high arid grassland with low vegetation productivity. Each of the selected sites will contain both enclosed and open range grazing management systems, or hybrid systems that combine elements of enclosure and open access.

Encouraging plurality and site-specific adaptations

The central hypothesis of RETPEC is that enclosure will be more prevalent and popular among pastoralists who have good access to markets and use rangelands that are intrinsically more productive. A corollary of this hypothesis is that no single system of grazing management and rangeland tenure is likely to be optimal under all conditions. Instead, it is likely that an array of different management systems will be appropriate to specific market and ecological conditions. RETPEC will therefore investigate the possibility that the most effective way to minimise rangeland degradation is to promote policies that encourage plurality and permit localised, site-specific adaptations.

RETPEC also hypothesises that grazing exclusions, or strictly enforced grazing bans, will be more prevalent in areas that have national rather than regional environmental significance, either because these areas represent unique conservation habitats or the upstream sources of nationally-important river systems, including the Yangtze and Yellow Rivers^{11,12}. A corollary of this hypothesis is the possibility that the extent of enclosure is correlated with the perceived off-site importance of a resource, and has little to do with on-site rates of resource degradation. To investigate this possibility, we will estimate the severity of degradation at sites that are subject to varying degrees of enforced grazing exclusion.

In testing these hypotheses with RETPEC, we are pursuing three primary scientific and technical objectives:

Firstly, we will compare the extent and type of rangeland degradation, including biodiversity indicators for both flora and fauna, between four major ecological systems within which both enclosed and open-range grazing management is practised. This comparative analysis will establish the conditions under which enclosure and enclosure leads or does not lead to rehabilitated rangeland.

Secondly, we will explore innovative approaches for rangeland rehabilitation and improved pastoral livelihoods under various systems of grazing enclosure and enclosure. The identification of these approaches will involve the participation of local pastoral communities, administrations, NGOs and other stakeholders in the study areas. Assessments of alternative management arrangements will also be informed by new data from field studies undertaken by the project, published in Chinese and multiple European languages.

Thirdly, we will evaluate the social, cultural and economic repercussions of changing land tenure and grazing regimes on the pastoralists concerned. Interdisciplinary field studies will compare the incomes and livelihoods of pastoralist communities that are rapidly adopting new grazing regimes that require sedentarisation, with those communities that remain engaged in semi-nomadic livestock husbandry. Through participatory methods, the project will gauge the impact of settlement on livelihoods in terms of household labour and gender roles, access to markets, employment and social services and lastly, the effects of new living situations on the pastoralists' cultural identity.

RETPEC is managed by The Macaulay Institute, UK. Other partners are the Chengdu Institute of Biology, Chinese Academy of Science, PRC, the College of Pastoral Agriculture Science and Technology, Lanzhou University, PRC, the Qinghai Academy of Animal and Veterinary Science, PRC, the Tibet Academy of Agricultural and Animal Sciences, PRC, Queen Elizabeth House, University of Oxford, UK and the University of Tromsø, Norway. RETPEC is funded by the European Commission's INCO DEV 6th Framework Programme. The project began in 2007 and is anticipated to finish in 2011/2012.

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The range enclosure on the Tibetan plateau of china:
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REFERENCES

1. National Research Council 1992. Grasslands and Grassland Sciences in Northern China. Report of the Committee on Scholarly Communication with the People's Republic of China. National Academy Press, Washington D.C.
2. Longworth, J., and Williamson, G. 1993. China's Pastoral Region: Sheep and Wool, Minority Nationalities, Rangeland Degradation and Sustainable Development. CAB International in association with Australian Centre for International Agricultural Research, Wallingford UK.
3. Wu, N. and Richard, C. 1999. The privatisation process of rangeland and its impacts on pastoral dynamics in the Hindu-Kush Himalaya: The case of western Sichuan, China. People and Rangelands Building the Future, VI International Rangeland Congress, Townsville, Australia.
4. Ho, P. 2001. Rangeland degradation in China revisited? *Journal of Development Studies* 37(3): 99-132.
5. Hardin, G. 1968. The tragedy of the commons. *Science* 162: 1243-1248.
6. Miller, D.J. 1999. Nomads of the Tibetan Plateau rangelands in Western China. *Rangelands* 21.
7. Williams, D.M. 1996. Grassland enclosures: Catalyst of land degradation in Inner Mongolia. *Human Organization* 55(3): 307-313.
8. Yeh, E. 2005. Green Governmentality and Pastoralism in Western China: Converting Pastures to Grasslands. *Nomadic Peoples* 9:1.
9. XueYong Z., Li, S., Zhang, C., Dong, G., Dong, Y. and Yan, P. 2002. Desertification and control plan in the Tibet Autonomous Region of China. *Journal of Arid Environments* 51: 2, 183-198.
10. Yaxing, W. and Quangong, C. 2001. Grassland classification and evaluation of grazing capacity in Naqu Prefecture, Tibet Autonomous Region, China. *New Zealand Journal of Agricultural Research* 44(4): 253-258.
11. Wang, G., Qian, J., Cheng, G. and Lai, Y. 2001. Eco-environmental degradation and causal analysis in the source region of the Yellow River. *Environmental Geology* 40: 7, 884-890.
12. YuXiang, D., Dong, G. and Li, S., 2002. Status and driving force of the sandy desertification in the Yarlung Zangbo river basin in the Southern Qinghai-Xizang (Tibet) Plateau. *Transactions in International Land Management: Volume 3*, 43-62.
13. Banks, T. 2003. Property rights reform in rangeland China: Dilemmas on the road to the household ranch. *World Development* 31(12).
14. Banks, T., Richard C., Li, P. and Yan, Z. 2003. Community-based grassland management in western China: Rationale, pilot project experience, and policy implications. *Mountain Research and Development* 23(2): 132-140.
15. Yan, Z., Wu, N., Dorji, Y. and Ru, J. 2005. "A review of rangeland privatization and its implications in the Tibetan Plateau, China". *Nomadic Peoples* 9:1.
16. Bauer, K. 2005. Development and the Enclosure Movement in Pastoral Tibet since the 1980s. *Nomadic Peoples* 9:1
17. Fischer, A. 2005. State growth and social exclusion in Tibet. Challenges of recent economic growth. Copenhagen, Nordic Institute of Asian Studies.
18. Goldstein, M., Jiao, B., Beall, C. and Tsering, P. 2003. Development and Change in Rural Tibet: Problems and Adaptation. *Asian Survey* 43(5).
19. Manderscheid, A., A. Naukarinen, et al. 2004. From subsistence to market economy: Responses of Tibetan pastoralists to new economic realities. *Rangifer (Special Issue 15)*: 29-37.