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To fence or not to fence : policy and enclosure on the Tibetan plateau

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Introduction Range enclosure , livestock intensification and nomadic settlement are being implemented by the Chinese government . The rationale is to restore degraded land , prevent desertification and improve pastoral welfare . The Qinghai-Tibetan plateau is the world's most extensive high altitude grassland with a mean elevation of 3 ,700 m , and an area of 310 million ha thinly populated mainly by some 5 million ethnic Tibetan farmers and nomads . For millennia the grasslands have sustained open range grazing by nomads raising sheep , goats , yaks , horses and cattle . An international interdisciplinary research project is investigating the impacts of policy-driven land use change in these grasslands* .

Materials and methods Across the Qinghai-Tibetan plateau , the project is comparing four grassland ecological zones in Sichuan , Gansu , Qinghai and the Tibet Autonomous Region , on an east-west precipitation gradient (from 700 to 200 mm annual) with associated differences in livestock grazing systems on vegetation varying from moist alpine meadow to desert steppe . Within each ecological zone , four field sites are selected to reflect the degree of fencing intensity-from unenclosed rangelands to private fencing of all pastures . A hierarchical research design begins with analysis of national policies , their application at county levels , field site investigations at village and township level and , finally , detailed surveys of individual pastoral households and their yaks , sheep and goats . The formal field work begins in spring 2008 , ending 2009 , and will gather data from 480 households and 4 ,800 livestock units and the pastures used by these livestock . Measurable indicators will be compared of vegetation , livestock productivity , land use , household incomes and wildlife biodiversity in enclosed versus unenclosed systems of rangeland management . Qualitative methods will also evaluate the social , cultural and economic repercussions of government grassland policies . Participatory techniques , involving pastoral communities , local administrations and NGOs , will incorporate indigenous knowledge and local concerns and contextualise quantified data .

Results and discussion The project has started to examine the implementation of Chinese government grassland policies on the Qinghai-Tibetan plateau . Preliminary findings from informal interviews suggest that fencing is being implemented unevenly , with largely unmeasured consequences . In the eastern wetter highlands , pastoral households with small herds are less likely to have fenced their allocated private pastures , and are renting these out to richer households with more livestock and need for private grazing land . If this trend continues , it could lead to consolidation of larger rangeland areas by richer families , while poorer families cease to raise livestock . Some local administrations have imposed grazing prohibitions and poorer households have had to move to towns where they can only obtain unskilled work . In the drier western regions , there is less private fencing , but whole communities are fencing off their pastures to exclude grazing by livestock from other communities . Government and some donor projects are actively encouraging livestock intensification through feeding cultivated winter fodder , but promotion of grassland policies tapers off in the more inaccessible , less productive and less populated regions . Market demand for meat from pastoral herds is growing , as income levels rise among China's urban population . Many Tibetan pastoralists have recently built permanent homes and winter livestock barns , often with government subsidies , and have ceased to migrate more than a few kilometres between winter and summer pastures , using tents .

Conclusions It is probable that no single system of grazing and rangeland tenure is optimal under all conditions in a heterogeneous environment constituting half of the rangeland area of China . Our goal is to identify forms of management appropriate to specific market and ecological conditions , to engage Chinese policy makers , and to improve the capacity of the Chinese scientific community to influence their government's rangeland development policies .

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