



Taylor & Francis
Taylor & Francis Group



AAG
Association of American Geographers

Cooperation, Land Use, and the Environment in Uxin Ju: The Changing Landscape of a Mongolian-Chinese Borderland in China

Author(s): Hong Jiang

Source: *Annals of the Association of American Geographers*, Vol. 94, No. 1 (Mar., 2004), pp. 117-139

Published by: [Taylor & Francis, Ltd.](#) on behalf of the [Association of American Geographers](#)

Stable URL: <http://www.jstor.org/stable/3694071>

Accessed: 16/10/2014 15:40

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Taylor & Francis, Ltd. and Association of American Geographers are collaborating with JSTOR to digitize, preserve and extend access to *Annals of the Association of American Geographers*.

<http://www.jstor.org>

Cooperation, Land Use, and the Environment in Uxin Ju: The Changing Landscape of a Mongolian-Chinese Borderland in China

Hong Jiang

Department of Geography, University of Wisconsin at Madison and Institute of Resources Science, Beijing Normal University

Human–environmental studies have done much to examine environmental consequences of conflictual politics but have paid scant attention to landscape implications of cooperation, especially when that cooperation is adopted by a group that is seen as politically less powerful. This article examines cooperative politics and its consequences for land use and the environment in Uxin Ju, a Mongol-dominated border area in China. Since the 1980s, in the context of China's economic reform, land use in Uxin Ju has become more intensified, and the identification of the Mongolian culture has shifted from land-use practices to symbolic features such as language and heritage. Much of the change has been influenced by the Mongols' cooperative relationship with the Chinese state and the Han Chinese people. The Mongols have participated actively in the state's project of economic modernization and have utilized their access to Chinese technology and laborers to their own advantage in bringing about land-use change that helps strengthen their economic well-being. This cooperative relationship and its impact on land use have to be understood in the historical context of Uxin Ju as a Mongolian-Chinese borderland, the broad socioeconomic transformation that is taking place in China, and the contemporary experience of Mongolian cultural change. The environmental outcome of such cooperation, however, is rather mixed. On the sandy dryland of Uxin Ju, as parts of the landscape are improved, other parts are sandified. The entire landscape has become more homogenized spatially; thus, its regenerative capacity is compromised. This calls into question any a priori correspondence between forms of politics and environmental consequences. *Key Words:* Politics, environmental change, Mongolian-Chinese interaction, cultural identity, cultural and political ecology.

Human–environmental studies have done much to examine environmental consequences of conflictual politics but have paid scant attention to landscape implications of cooperation, especially when that cooperation is adopted by a group that is seen as politically less powerful. This article examines cooperative politics and its consequences for land use, culture, and the environment in Uxin Ju, a Mongolian pastoral area situated in Inner Mongolia Autonomous Region, China. Although, historically, the Mongols' relationship with the Chinese has often been conflictual, since the 1980s, Mongols have actively participated in the Chinese state's project of economic modernization and have utilized their access to Chinese technology and laborers effectively in order to expand their own economy. Mongols' cooperative relationship with the Chinese state and the Han Chinese people has precipitated significant changes in land use, cultural identity, and the environment in Uxin Ju. For example, not only have intensive land-use practices of enclosure, planting, and irrigation increased on the landscape, but cultural significance of land use has also become diluted. Environmentally, both improvement and degradation have resulted, displaying a more compli-

cated picture than the typically reported scenario of degradation.

Focusing on cooperation and its cultural and environmental consequences, this article expands upon the forms of politics in political ecological studies, notably the commonly accepted framework that privileges conflicts between groups and resistance of the weak. In refusing the assertion that Mongols are either resisters or victims in managing their own landscape, this article promotes an alternative theorization, that of cooperation initiated by the Mongols, that helps explain the most fundamental changes in the landscape and related aspects of the Mongolian culture. While steering away from resistance as a particular form of environmental politics, this article builds upon the basic premise of resistance scholarship: the active power of human agency. I contend that when accorded a certain degree of freedom, the group deemed less powerful, in this case the Mongols, not only may cooperate with the seemingly powerful, in this case the Chinese people and state, but also can use such cooperation to empower itself both culturally and economically. Such an empowerment, however, does not necessarily bring about long-term environmental sustainability, as the

experience in Uxin Ju demonstrates. This lack of correspondence between forms of politics and environmental outcomes speaks to the complexity of regional human–environmental realities. This article calls for a serious consideration of cooperative politics and its environmental consequences.

To situate this study, I begin by addressing theoretical issues about the relationship among cooperation, power, and the environment. This is followed by a discussion of field research methods that are employed in this study. These theoretical and methodological issues are then interwoven in the four sections that structure my discussion of cultural–environmental transformations in Uxin Ju. The first section introduces the case study area, focusing on the history of the Mongolian–Chinese relationship and land use before 1978. A brief discussion of Chinese immigration is included. The second section examines interactions between the Mongols and the Chinese, in particular, how the state has helped structure the interactions, and how the interactions have occurred around land use. This is followed by a third section that examines the consequences of Mongolian–Chinese interactions for land-use and cultural change. The fourth section examines the environmental consequences of land-use and cultural change through the analyses of remote-sensing images and ecological processes. In the conclusion, I summarize key findings of this study and reflect on the politics of cooperation and its implication for political–ecological study.

Introduction

Cooperation, Power, and the Environment

Many scholars maintain that landscape change is a result of power differentials (Watts 1983; Bryant and Bailey 1997). Global capitalism, state politics, and institutional arrangements often play predominant roles in determining the fate of the local environment, especially in causing degradation (Blaikie 1985; Walker 1989). The domination of state and capital is exercised through not only material processes but also discursive strategies (Peet and Watts 1996). When the state and dominant groups impose unfairly on the less powerful groups or regions, resistance has been an important strategy local people use to gain power and to maintain a livelihood (Scott 1985; Peluso 1992). Scholarship on local resistance to hegemonic state discourses has highlighted the role of agency in human–environmental processes. Empirical study in developing countries, especially in the postcolonial states of Africa, South America, and South/Southeast Asia,

has shown that local people have resisted changes imposed by the government and developmental agencies through strengthening their indigenous institutions and practices (Richards 1985; Howitt, Connell, and Hirsch 1996).

The excellence and importance of these research projects have been taken to foster the understanding that resistance is a trademark of critical scholarship, a sign of taking politics seriously. But as Bebbington (2000) warns, privileging resistance runs the risk of detaching politics from livelihood practices. The diversity and specificity of different localities and local cultures can lead to a wide array of local responses, including resistance (Peluso 1992), assimilation, and cooperation (Bebbington 2000). Local agencies have the capacity either to enhance or alter structural forces (Giddens 1984), thus creating diverse social and environmental outcomes. Local people may indeed cooperate with the state and other groups in order to achieve their own goals and gain their own power. Such cooperation can become, at times, the primary feature of group–group and local–state relationships. Privileging resistance runs other risks, too. It may, however unintentionally, help to essentialize local cultures and thus undermine the importance of cultural change, which often blurs the distinction between the indigenous and the outside. Not only can local people direct external forces to their own advantage and “build modernity from below” (Bebbington 2000), local cultures also change when interacting with external forces, exhibiting what is seen as cooperation. Globalization has made such cultural change commonplace. Uxin Ju, like other pastoral societies, has long been influenced by the outside world (Khazanov 1994), and interaction with the Chinese has long ago made it into a place of “mixed life” (Lattimore 1940). Thus, Uxin Ju’s continuing transformation under external influences is not a new phenomenon but part of a long historical process of cultural change.

Can there be a politics of cooperation? To put it differently, since being political is often taken to be conflictual, how can cooperation serve as a form of politics? To answer this question, first consider the original meaning of the word “politics.” Politics is derived from the Greek word *polis*, meaning city, or *politicos*, pertaining to citizens. Politics, formal (as in state policy formation) or informal (as in everyday interaction among people), helps to make a city or community viable, which requires considerable cooperation. Achieving economic viability is exactly what the Mongols in Uxin Ju attempt to gain by engaging in collaborative relationships with the Chinese state and the Han Chinese people. Second, even when politics is taken as a means to gain self-interest, political scientists have long demonstrated that cooperation can

often benefit egoists better than conflicts (see Axelrod 1984). Furthermore, in relationships involving power differentials, the powerful groups can only gain power through cooperating with other members. It is inconceivable to consider conflictual politics without the inclusion of cooperation. Given its critical stance toward power relationships and structural forces (such as the state), however, political ecology has not paid much attention to collaborations among groups or between the local people and the state, let alone their environmental implications. Poststructural political ecology has opened doors to the exploration of a diverse set of politics (Peet and Watts 1996; Moore 1999), and studies considering environmental politics of collaboration are called for.

This article considers two kinds of cooperative relationships in Uxin Ju: the Mongols' relationship with the Chinese state—their participation in the state's modernization project—and the mutually beneficial relationship with the Han Chinese people in the surrounding area in affecting land-use change and economic development. In highlighting cooperation, I emphasize that the Mongols have utilized their relationships with the Chinese state and people to enhance their own livelihood and that local initiatives have played important roles in defining land use, the economy, and the environment. Cooperation is not a simple matrix of compliance; rather, like resistance, it involves various strategies that help to benefit the local community even when the goals of the local community and the state do not overlap. One such strategy involves cultural change, which will be discussed further in the concluding section. In addition, local cooperation does not equal land degradation, just as local resistance does not necessarily bring about environmental protection. The mixed results of environmental improvement and degradation in Uxin Ju attest to a complicated relationship between society and the environment.¹

There is a particularly important reason for considering the politics of cooperation in the Chinese context. China is a state that has exercised strong influences on all corners of its territory and all spheres of the society. While it is important to understand why certain state policies are resisted, it is equally important to examine why state policies have worked to produce significant impact on the local society and environment (Muldavin 2000). With local collaboration, the effects of the state become amplified, and any positive or negative consequences will also be multiplied (Jiang 1999). When state policies do not suit local conditions, local collaboration heightens the potential dangers of state interventions. An analysis of state–local collaboration allows us to understand the environmental impacts of the state and local people, thus offering the opportunity to be critical of both.

A Note on Methodology

Key methodologies employed in this study include ethnographic interviews, site visits, and remote-sensing image analysis. While details of the remote-sensing analysis will be discussed in section four, this section briefly explains the field interviews, which were conducted during the summers of 1992, 1998, 1999, and 2001. Each summer, I interviewed about 20 Mongolian households of various economic statuses in order to understand household economy, land use, and cultural change.² Interviews were conducted in the Mongolian language with the help of an interpreter.³ Specific questions addressed the following topics: household sizes; types and areas of distributed pastureland; current land-use inventory; history of change with each land-use type; origin of new land-use practices; number of livestock; inventory of machinery; access to markets; communications with the outside world; changes in diet and housing; perceptions of land and views about its change and improvements; views about government policies, communications with and views about the Chinese; and plans for the future. Given the low level of literacy in Uxin Ju, I conducted the interviews in the form of conversations rather than questionnaires. Each of the above topics was addressed by multiple questions. For example, on the “distributed pastureland” topic, I asked the following questions: “What is the total area of pastureland that was distributed to your household?” “What are the types of pasture?” “How large is each type?” and “Where are they located?” Some of the topics not only needed to be broken into subtopics, they also needed to be addressed indirectly. For example, on the “communication with the outside world” topic, I asked my interviewees where/from whom they had learned about each of the new land-use practices. I also asked them whether they read books and magazines and if so, what they were; what radio stations and television channels they watched; whether they had any relatives who lived outside the area with whom they talked about land use; whether any members of the household had traveled outside the area and if so, where they had visited and how often. Interviews usually lasted from two to four hours, and they were often supplemented by repeat visits. In addition, participant observation was conducted to supplement formal interviews.

Intensive interviews were also conducted with governmental officials. Paying attention to influences at multiple levels (Blaikie and Brookfield 1987; Turner 1999; Vayda 1983), I interviewed a total of 15 government officials at the *banner*, *sum*, and *gacha*⁴ levels, tracing policy changes, linkages, and their executions at various levels. This helped me to locate local land-use change in the broad context of regional policies.

In recent years, ethnographic interviews have drawn much debate (Clifford and Marcus 1986; Behar and Gordon 1995), focusing on the unavoidable subjectivity characteristic of these interviews. To reduce the effect of my own preconceptions on shaping the outcomes of my interviews, I made particular effort to cross-check the views of individuals. Although group interviews were conducted on only two occasions, most household interviews involved an adult couple, whose views could be compared. I also consciously modified my own conceptions in light of patterns, and understandings emerged through interviews. For example, with respect to the issue of local responses to government policies, I expected to discover resistance by the local people in Uxin Ju, a Mongolian area that is controlled by the Chinese state, after having read the literature espousing this position. However, the interviews slowly taught me that such a pattern was not significant at all; instead, the opposite was true. I then had to expand my interview questions in order to understand why the Mongols willingly align themselves with the government's agenda of economic modernization. This eventually led me to ask questions regarding cultural change, shifting views about land-use practices, and Mongolian cultural identities. As I remained committed to reflexivity in interactive interviews, new questions emerged. It was through the new paths forged in my interviewees' responses that I came to know the richness of the place and to understand how these people's lives and practices are connected with the land.

Uxin Ju: A Mongolian-Chinese Borderland

Historical Appraisal

To situate Uxin Ju's human-environmental change in a historical context, this section introduces the Mongolian-Chinese relationship and land use before 1978. Uxin Ju is a Mongolian *sum* (township), situated in Uxin banner of Ih-Ju League (recently renamed Ordos City), Inner Mongolia Autonomous Region, China (see Figure 1). Its area is 1,744 km.² Physically, Uxin Ju is dry, with an annual precipitation of 146 to 526 mm (during 1970–1997), averaging 321 mm. The soils are sandy, and moving sand dunes cover a significant portion of its landscape. Natural vegetation includes sandy shrubs (*Artemisia ordosica* and *Caragana intermedia*) and lowland grass (*Carex duriuscula* and *Achnatherum splendens*). Animal husbandry constitutes the main rural economy, and livestock includes mainly sheep, along with some goats, cattle, horses, mules (as draft animals), and pigs. Of its 5,448 registered inhabitants in 1997, 69 percent were Mongolian. The rest were Chinese, mostly workers in local alkali factories. The

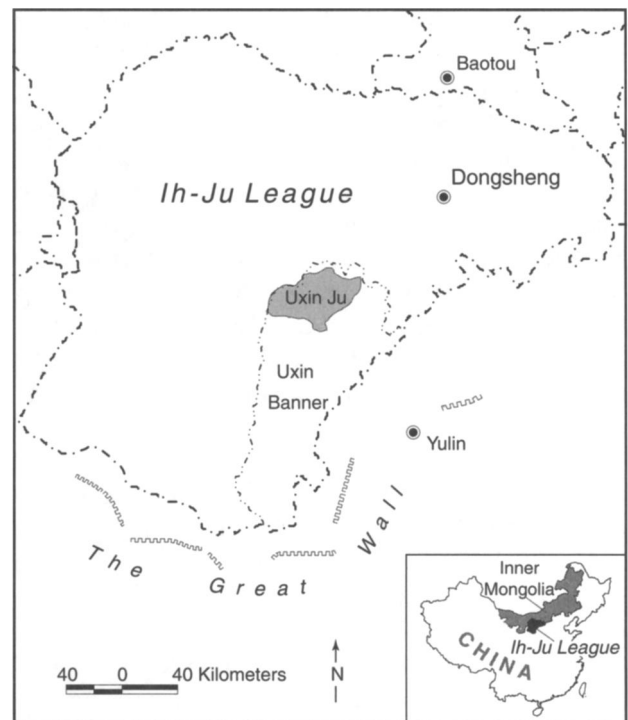


Figure 1. Uxin Ju and its surrounding area.

Mongols remain the dominant population, at 93 percent, among those managing the pastureland.⁵ For this reason, this article concerns mainly the Mongol pastoralists and their impacts on land use and the environment.

Historically, Uxin Ju is home to the Uxin tribe of Mongols. Bordering with the Chinese, however, it has witnessed a long history of Mongolian-Chinese cultural interactions. The Great Wall, about 170 km to the south, was built to demarcate a boundary between the Chinese and the northern nomads. In reality, however, interaction beyond the Wall, through either trade or war, has lasted for over two millennia (Lattimore 1940, 1962; Jagchid and Symons 1989). As a result, Chinese technologies have long influenced Uxin Ju. For example, in the late 1800s, the Mongols started to adopt a semisettled life with semipermanent living quarters made of *Salix* branches and mud. Dryland farming emerged even earlier (interviews, 1998, 1999). In the 1930s, Lattimore (1940) found Inner Mongolia a very different place from Outer Mongolia, owing to its close contact with and influence by the Chinese.

By 1947 when the Chinese Communists took over Inner Mongolia, while large areas of grassland in Inner Mongolia had been given over to cultivation, Uxin Ju's dry sandy land had not experienced much direct Chinese influence. Significant land-use change occurred after 1949. During the 1950s and 1960s, the Chinese socialist

ideology introduced Uxin Ju to intensive land-use practices such as tree planting and grassland enclosures. Improvements to the landscape brought about by these efforts, however, could not offset pastureland degradation caused by the opening of grassland during the Great Leap Forward (1958–1960) and the Cultural Revolution (1966–1976). The centrally controlled economy also encouraged raising more livestock than the pastureland could bear. As a result, moving sand expanded and pastureland productivity was reduced (Jiang 1999).

Three Geographic Scales

To understand the Mongols' relationship with the Chinese and its role in land-use change, three geographic scales must be considered, each with its own historical dimensions. The first is the relationship at the national level. From the time of the Han Dynasty (2nd century BCE) the Chinese and nomadic powers exchanged control of Inner Mongolia, making the area along the Great Wall, including Uxin Ju, a "contest zone" (Gaubatz 1996). Such a counterbalance ended with the Qing Dynasty when the Chinese empire took continuous control of the area. The Chinese people moved in, and the grassland was opened for cultivation (He 2001). Under the socialist regime after 1949, this border region became increasingly integrated into the national politics, and Chinese state policies played a significant role in altering its landscape. Cultural interaction between the Mongols and Chinese has been unbalanced and sinicization has been predominant at the national level (Han 1999).

The second scale of the Mongolian–Chinese relationship has been played out regionally. Regional interactions between the Mongols and Chinese have been conducted largely on the basis of mutual benefit. Traditionally, the Mongols relied on trade with the Chinese in the south for such goods as grain, tea, salt, and textiles (Morgan 1986, 33–35). Grazing arrangements across the Great Wall also were common, as Chinese sheep/goat grazers in the south frequently arranged to have their flocks grazed in Uxin Ju. In recent years, as Uxin Ju became integrated into the regional economy, not only has material exchange with the south increased, the flow of information about the market and land-use technologies has also become increasingly important for Uxin Ju. In addition, short-term and sometimes long-term laborers from Northern Shaanxi are hired in Uxin Ju to perform cropping-related activities. The hiring of Chinese by the Mongols reverses the typical image of Chinese domination.

The third scale of the Mongolian–Chinese relationship is local. In Uxin Ju and its surrounding areas, Chinese

migration from the Qing Dynasty slowly pushed the Mongols out of the southern part of Uxin banner where the pasture was of the best quality, and the Mongols now are mostly settled on dry sandy land. My interview informants, however, softened the view that the Chinese were aggressive intruders. Most Chinese immigrants were poor farmers from the Yulin area in northern Shaanxi, escaping hardship and crop failure brought about by drought and social unrest. In a desperate search for survival, these immigrants came to Uxin banner with next to nothing and worked for Mongolian herd owners. Some built good relationships with the Mongols and were allowed to cultivate the grassland, but most grazed livestock. Only a small number of immigrants came as merchants of grain, tea, or salt. Although in other parts of Inner Mongolia, some Chinese merchants became landowners with considerable influence (Lattimore 1940, 80) in Uxin banner, they did not gather enough wealth to gain similar power. Uxin Ju, with its dry sandy land unfavorable for farming, attracted only secondary Chinese migrants who had already developed grazing as their main livelihood. By 1949, the Chinese population accounted for only 4 percent of the total population. During the Cultural Revolution, the local government invited Chinese farmers to teach the Mongols farming techniques; some stayed but the number was limited. Although Chinese constitute the national majority, in Uxin Ju they belong to the minority. A certain degree of mutual disdain exists between the Chinese and the Mongols, but overall, mutual influence has prevailed. As the Mongols started to expand cropping, their interaction with the Chinese became more beneficial.

These three scales of Mongolian–Chinese relationships render inadequate simplified views of Mongolian–Chinese interactions as those of the colonizers and colonized. As the geographic scale shifts from national to regional and local, the power of the Mongols becomes more pronounced, allowing room for their own initiatives and actions. This is similar to Bebbington's (2000, 496) "room-for-manuever," which provides opportunities for the local people to define their own lives. The term "politics of cooperation" signifies such maneuvering power of the Mongols as they interact with the Chinese state and culture in defining their own land-use practices.

Mongolian–Chinese Relationship and Land Use

Against the background of a Mongolian–Chinese borderland, this section examines how, since the 1980s, the Mongols' relationship with the Chinese State and the

Han Chinese people has influenced land use in Uxin Ju. While the historical trend of strong Chinese influence continues, what is unique during this period is the Mongols' cooperative engagement with the Chinese state and people. China's economic reform has created institutional incentives for the Mongols to participate actively in the state's project of economic development. At the same time, Mongols have actively sought to increase their access to Chinese technologies in order to bring about new land-use practices that help enhance their economic well-being.⁶ The Mongols' relationship with the Chinese has provided the main impetus, and the key explanation, for land-use and related cultural change in Uxin Ju.

Land Use, Environment, and the Chinese State

In the 1980s, to pursue economic development, China launched an economic reform that has had a profound effect on land use. The reform was supported by the introduction of two institutions. First, a "Household Responsibility System" was established in the early 1980s, which effectively privatized resource use and production. In Inner Mongolia, a two-tier responsibility system was set up, distributing both livestock and pastureland, previously owned by the communes, to households. In Uxin Ju, livestock was distributed in 1982. The distribution of pastureland first occurred in 1983; it was adjusted and reaffirmed in 1986 and again in 1997. Second, in keeping with resource privatization, a market economy was introduced in the late 1980s. The Chinese government slowly loosened control of pastoral production, allowing the market to regulate supply, demand, and price (Longworth and Williamson 1993). Flexible prices and the private procurement of wool and meat brought Uxin Ju increased exposure to national and even global markets (Zhang 1990). Meanwhile, producing for the market became the main goal of pastoral production in the household. Both privatization and the market economy have direct implications for land use and the environment since both have encouraged intensive management of the grassland.

The state has also exerted direct influences on the landscape through financial and administrative means. The government has provided fiscal incentives for intensive land use. For example, after usable pastureland was distributed, the sandy "wasteland" was contracted to households in the 1990s, with the government stipulation that reclaimed wasteland would be awarded as additional tax-free pasture to the households that improved it. To encourage irrigation, the government exempted tax on irrigated cropland (until 2001). From 1978 to 1996, government investment in pasture enclosure accounted

for 23.3 percent of the total cost in Ih Ju League (Liu and Wang 1998). The purchase of seedlings and seeds for tree, shrub, and grass planting have largely come from government funds, while households provide labor input. Administratively, grassland improvement has been an important part of regional and local governmental functions. The upper government designates task acreage for grassland improvement, along with matching funds. In 2001, for example, Uxin Ju received 43,000 *mu*⁷ for improvement tasks, in addition to 126,000 *mu* of sandy land that would be seeded using airplanes. The Uxin Ju local government makes every effort to fulfill these tasks. Each government leader is allocated responsibility to help a certain number of households plant trees. Each year, Uxin Ju has spring and fall planting sprees, during which all leaders go to their allocated households to participate in planting. The government also provides technical assistance in land use. Extension workers from Uxin banner make frequent visits to select households to experiment with new planting and cropping techniques. These techniques, once successful, quickly spread to other households.

Mongols in Uxin Ju have responded with active engagement to the state's economic project. Not only have they participated in the land-improvement programs, they have also embraced it as their own goal to improve the grassland in order to develop household economy. Take pasture enclosure, for example. After the grassland was distributed in 1983, households started to build enclosures in order to protect their own pastures. By 2000, some households, such as Bayinsongbuer's, had spent an accumulation of over 20,000 yuan (approximately US \$2,500) on fences, an impressive sum given the net per-capita income of about 2,000 yuan (US \$250) in 2000. The households' active pursuit of having their own pastures seeded has made the fulfillment of the government quota in airplane sowing easy. All households desire to be chosen for government programs—such as the Family Pasture (a highly integrative pastureland and pastoral development program, which I will discuss later), Irrigation Development, and Specialized Animal Husbandry (of sheep and cattle)—not only because all programs come with fiscal incentives in the form of financial aid or interest-free loans but also because they all help improve household economy. Intensive land use such as tree planting and crop irrigation has become the central part of future planning in the household (interviews, 1998, 1999, 2001).

The Mongols' cooperative response to the state can be better understood through their changing views about the environment. As the market came to affect household economy, Mongols began to see that producing for the

market is the best way to improve their livelihood. To the traditional view of nature–culture unity (see Tseren 1996) has been added a variety of pragmatic market influences, and the environment is increasingly seen as a means for market production. The goal of the state (i.e., economic development), therefore, is largely consistent with the desire of the Mongols to improve their livelihood; both rely on intensive use of the grassland.

Not only have the Mongols engaged actively with the state's economic programs, they have also interacted closely with the Chinese, either to gain new skills in land use or to access Chinese laborers to help in land improvements. While the state has offered incentive structures for the Mongols to reach for the Chinese technologies, ultimately, it is the Mongols themselves who define their land use and shape their environment. Mongolian-Chinese interaction provides the key to understanding the *processes* of such defining and shaping.

Mongolian–Chinese Interaction

Since 1947, Mongolian-Chinese interactions have increased owing to two factors. The first is the increased size of the Chinese population in Uxin Ju and the surrounding areas. In 1958, of the total population of 2,305, only 4 percent were Chinese whose ancestors had immigrated to the region in the late 1800s and the early 1900s. Pastureland reclamation policies during the 1950s and 1960s encouraged a new wave of Chinese immigration, under which the Uxin Ju government invited Chinese farmers to move in to farm. Chinese farmers became the actual executors of the reclamation policy. This led to a spike in the Chinese population in the 1970s, when it ranged from 16.6 (1970) to 13.8 percent (1979) (Uxin Ju Statistics 1998). Even though the reclamation policy was corrected after the 1970s, some Chinese farmers stayed to live the pastoral life of the Mongols. The most recent wave of Chinese immigration started with the establishment of the town of Chahanmiao in 1996, which led to a second spike in the Chinese population. About three-quarter of Chahanmiao's population of 10,000 is Chinese, who come from the north (especially Dongsheng), the west (especially Wuhai), and the south (Shaanxi Province) (interviews, 1998, 1999). The Chinese population brought with it techniques in land use as well as ideas from the larger Chinese society. Through their interactions, the Mongols and Chinese each modified their own cultural practices. The second factor that enhanced Mongolian–Chinese interactions was improved communication, that is, improved transportation and media, which exposed the Mongols to Chinese culture

and modern agricultural techniques beyond those of their immediate neighborhoods.

The expansion of new land-use practices can be traced to Chinese influences, both in ideology and in techniques. Among the new practices that were borrowed from the Chinese, irrigation and corn cultivation are probably the most conspicuous. Irrigation first emerged in Uxin Ju in the 1960s and relied mainly on natural spring water. Following spring-water irrigation, open pits were used to gather groundwater for irrigation. Even drinking water was stored in big holes dug into the ground and covered by *Salix* branches. The first drinking well was dug in 1983, with water raised by an air pump. Irrigation wells first appeared in Uxin Ju in 1986 after such techniques had been used by the Chinese in the south. These wells use diesel engines for power to draw water from the ground into a white plastic pipe called “the little white dragon.” With government encouragement, irrigation has expanded quickly since the 1980s. By 1999, most families I interviewed had one or two irrigation wells equipped with diesel engines, enabling them to water their 15 *mu* of cropfields.

Even some of the techniques in animal husbandry have been transferred from the Chinese to the Mongols. One example is sheep shearing. Before 1949, sheep shearing in Uxin Ju was performed by Chinese merchants rather than Mongolian pastoralists. At winter's end these merchants arrived on horses or donkeys with tea, salt, grains, cloth, household goods such as bowls and food containers, and luxuries such as cakes and candies to trade with the Mongols. Huhelao, one of the interviewees, recalled that 18 cakes were traded for one sheep. They also contracted with the Mongols to shear their sheep: five cakes and some dry dates were exchanged for shearing all the sheep for one family. The work was then performed the following summer. To the Mongols, this was a needed service, so they readily allowed the merchants to take away the wool, which was traded in the wool market in Baotou and other major cities. In the 1950s, animal grazing was collectivized and a wool quota was imposed by the Chinese government. To learn sheep shearing themselves, the Mongols in Uxin Ju invited 63 Chinese teachers from Yulin.

Close interaction between pastoralists and agriculturalists is certainly not unique to Uxin Ju (see Galaty and Johnson 1990; Khazanov 1994). In Africa and India, for example, farmers' fallow fields were used by pastoralists during winter seasons (Agrawal 1998; Bassett 1988). Increasingly, this relationship is affected by increased influences from the outside world, such as the market. In Rajasthan, India, the relationship between pastoralists and agriculturalists was mutually beneficial, for it meant forage for the former and sheep manure for the latter.

However, intensification of land use, with the help of irrigation, attenuated this linkage as agriculturalists started to till their land more than once a year (Agrawal 1998, 14). A unique aspect of Uxin Ju is that land-use intensification occurred among both the Chinese and the Mongols. As the Mongols added more “Chinese” practices in land cultivation and management, their relationship with the Chinese intensified rather than attenuated, and the web of connection between the Mongols and Chinese became even more intricate and pervasive.⁸

It is important to acknowledge the complexity of the Mongols’ relationship with the Chinese, as has been indicated earlier. Historically, the Mongols’ connection with the Chinese brought both losses and gains. Since the 1980s, the Mongols have used their easy access to Chinese practices to their own benefit. With increasing access to the market, they seek to expand their land-use practices in order to enhance their economy and meet the market demand. Their active participation in adopting new land-use practices makes it erroneous to claim that the Chinese and the government have forced the change. My interviewees stressed their own ingenuity and initiation. One interviewee said, “We started grassland enclosure in the 1960s by ourselves.” Another, Huhelao, considered the Mongolian–Chinese relationship to be “mutually beneficial.” He added, “The Chinese bring farming and other techniques to the Mongols, and the Mongols help the Chinese in making dairy products.” Even the merchant–Mongol relationship is viewed from quite a different angle. After the wool market was opened, it was largely the outside (mostly Chinese) merchants who collected wool and cashmere from the locals and sold them at a higher price. When I interviewed Caidang, a local leader in Uxin Ju, however, he said one of the local strategies for economic development was to “encourage outside merchants to come and play a key role in opening a market channel.” In fact, one key task of the government secretary Zhangga is to visit outside places to locate possible new markets for the sale of wool and cashmere. Chinese merchants are thus seen as playing a beneficial role in the economy of Uxin Ju.

Land Use and Changing Mode of Mongolian–Chinese Communication

Whether invented locally (such as grassland enclosure) or coming from outside the area, all intensive land-use practices are supported by a conception of reforming nature that originated in the Chinese farming tradition and is advocated by the Chinese state. Communication with the Chinese reinforces this conception. To understand how a new land-use practice enters and spreads in

Uxin Ju, I have investigated many individual cases, each of which underscores the important role of direct or indirect communication with the Chinese. Typically, the pastoralists who have better access to Chinese technologies start experimenting with certain new practices, which, if deemed economically promising by the local people and the local government, are then spread, often with government financial support.

Communication is, first of all, direct. The Mongols are in touch with the Chinese who live in the area. The Uxin Ju Sand Control Station, set up by the government in 1959 to experiment with sand control techniques, was closed after the 1980s, but its workers, mostly Chinese, remained and oftentimes are pioneers in experimenting with farming techniques. The pastoralists only have to visit these Chinese to know what is new. They also travel to Shaanxi to learn specific techniques. For example, well digging facilitated the expansion of irrigation. Barlaji and his wife Arlateng, who were among the first to use wells, recounted their experience:

We learned about irrigation wells from *Ordos Daily* in 1986 and learned the skill [of well digging] from the Chinese farmers around here. We were also the first to dig drinking wells in 1983. I [Barlaji] went to Shaanxi and learned the skill, and then came back to dig drinking wells for people around here.

Not only do the Mongols travel south to learn new techniques, the Chinese also travel to Uxin Ju as temporary laborers. Chinese immigration into rural Uxin Ju has stopped since the 1980s, but seasonal migrant laborers from Northern Shaanxi are common. Farmers there have less arable land, and their economic life is often difficult. Extra laborers often flow to the Mongolian areas, working as hired laborers in Mongolian households. They typically undertake land flattening, cropping, and tree planting—tasks that require farming-related skills. Some also come as small merchants, collecting wool and cashmere, or as skilled laborers in repair, construction, and handcrafts. In 1999, about 20 percent of households in Uxin Ju hired short-term Chinese laborers, spending about 500–1,000 yuan a year, at 15–20 yuan per day, and providing them with room and board.

Connection with the Yulin area, familiarly known as “the south,” has been particularly important for Uxin Ju. In conversations with the pastoralists, Yulin is mentioned more often than any other place. Many people, especially the male heads of households, have traveled to Yulin City. Even those who have not been there have had close contact with the people from Yulin, the ancestral home of most Chinese who now live in the area. Although the administrative center of the area—Dongsheng—is in

the north, most people prefer to go to Yulin to buy equipment, seeds, and other agricultural supplies, since the prices of supplies tend to be lower there than in the local area. Yulin also provides information about new land-use technologies and the market. It seems accurate to say that, for a long time, Yulin has been the outside world for Uxin Ju.

After contact with Chinese farmers over time, new farming techniques are more easily undertaken by the Mongols.⁹ Badarihu is a local exemplar in tree planting and, according to the local regulations, has been awarded additional pastureland that he had improved from sandy land. In 1983, when pastureland was distributed to his family, it was treeless. Since then he has led his family of six to plant more than 10,000 trees and 350 *mu* of shrubs. At age 78, he was still strong and spoke with great clarity and certainty:

Planting tree is good—the country has one less piece of sand and we ourselves have one more piece of green. When I first started planting trees, neighbors did not understand and asked me, “What are you doing with the sand, old man?” . . . Trees are pasture in the air—leaves are good forage.

When I asked him how he learned to plant trees, he answered matter-of-factly:

I am carrying the technique with me. I am from Ejin Horo [a banner northeast of Uxin Ju] and lived with the Chinese. Life was difficult there, and I could not raise my four children. We had relatives here so we moved—it’s been 32 years. There I farmed—I am a farmer not a herder.

With the improved economy, the pastoralists of Uxin Ju have expanded their connection to the outside world through communication media: books, magazines, newspapers, and radio and television programs—most of which are in the Chinese language. Contact with the Chinese goes beyond the Yulin area, and indirect communication has become increasingly important. Among the 70 percent of the households that own a television set, about one-third have installed extended antennas to receive over 20 television stations beyond the local area. Moreover, technical books on the use of machinery and other equipment, as well as on farming and grazing techniques, are mostly in Chinese. The majority of the interviewees considered Chinese technical books an important source of information on farming, livestock breed improvement, crop variety selection, and forage and feed processing.

Willingness to take risks in experimenting with new practices increases with widened contact. Although it is not the influence of the Chinese per se, the mere fact of openness to the outside ideas has brought about changes in Uxin Ju. Aotuogen’s family was among the first to dig irrigation wells. In 1988, his brother, after serving as a

soldier for five years, came back home, bringing information about irrigation wells. They also started to plant a high-yield corn variety introduced from outside in the same year. Songbuer’s story is even more telling. He used to work at the government supply store during the collective era, and, therefore, was exposed to the outside world. In 1997 he organized seven households, all neighbors and relatives, to invest in the cultivation of *Ephedra sinica*, a medicinal herb that is assessed to have a sizable demand in the Chinese market. *Ephedra* is native to Uxin Ju’s sandy land; however, its natural production has dwindled due to overcutting (Jiang 1999). Supported by the government as yet another viable experiment, Songbuer and his team received 100,000 yuan in a loan and 300 *mu* of continuous pastureland. They immediately flattened the land, installed irrigation equipment, and started nursing *Ephedra* seedlings. It is estimated that *Ephedra*’s leaves can be harvested in three years, bringing in about 1,500 yuan per *mu* of income. Responding to my question about the origin of his idea, Songbuer said,

I had the idea of cultivating *Ephedra* for quite a few years. I heard that in Taoli some Chinese went there to cultivate *Ephedra*, and the banner gave special permission and land for it. It was successful. Then the government supported its expansion. In 1995 I went to Ototog with local leaders to observe *Ephedra* cultivation and spray-style irrigation. I thought I would help others cultivate it, but there was not much interest. Now I have to do it myself.

Pioneers like Songbuer enjoy maximum outside contact. If their experiments turn out to be successful, they easily secure government support. Their influence spreads to bring about significant changes in Uxin Ju.

Language plays an important role in the Mongolian-Chinese connection. Most Mongols know Chinese at various levels of proficiency. Daily language spoken in the area is Mongolian. Most people can speak some Chinese, however, and a majority of the high-school graduates can read Chinese. Uxin Ju has one primary school, and classes are taught in Mongolian, but students start to learn Chinese in third grade. The banner has both Mongolian and Chinese high schools, and some Mongolian families have started to send their children to Chinese high schools for better opportunities in the national entrance exam, as well as for better job opportunities. When Barlaji and Arlateng bought a four-wheeler, they could not read the Chinese instructions. They began to realize the importance of Chinese language and started teaching themselves through reading dictionaries. Later on, as they became involved in sheep breed improvement, corn cultivation, and corn-stalk storage, they relied more and more on their ability to read Chinese. Using the Chinese

language is an indication of Mongolian assimilation, but it is, to an extent, reciprocated by the Chinese. Most Chinese I interviewed either speak or understand Mongolian. However, Mongolian and Chinese languages are not used equally in Inner Mongolia, especially in urban areas. As a whole, Inner Mongolia, although a Mongolian Autonomous Region, has more Chinese (80.6 percent) than Mongols (15.7 percent). The Mongolian language programs have been found extremely lacking, leading to what Bilik (1996, 1998) calls the demise of the Mongolian culture. Mongolian is for family and local use, whereas Chinese is for outside communication. This explains the lack of Mongolian publications and the overwhelming need for the Mongols to learn Chinese.

The effect of Mongolian–Chinese communication follows geographical patterns. The Chinese influence comes mostly from the south, so the transfer of ideas and technologies also follows the route from south to north. Manduhu, a government staff at Uxin banner, informed me in 1998 that “if you want to see the future of Uxin Ju in 10 years, go to see Taoli (in the south) today. Taoli follows Henan (which is further south).”¹⁰ This south-to-north transfer of Chinese technologies is further enhanced by a leader-swapping program established by Uxin banner. In that program, government leaders in Uxin Ju were swapped with those of Taoli for two to three years, thus allowing economic strategies and techniques from the south to infiltrate the area.

Land-Use and Cultural Change

Mongols’ active engagement with the Chinese state and people has brought about significant changes in land use and cultural identities. In arguing for the importance of Mongolian–Chinese interactions in manifesting these changes, I shall remind the reader that cultural interactions do not operate in isolation but have to be understood in the broad context of the socioeconomic transformation that is taking place in China. While human–environmental change has been influenced by a suite of inter-

related factors including government policies, economics, and the market, I argue that the Mongols’ participation in the state’s economic project and their interaction with the Chinese people around the area have been the main direct impetus for lasting changes in land use and cultural identities.

Changes in Land Use and Pastoral Economy

Intensive land use has become the backbone of household economy. Table 1 shows a summary of household land use derived from interviews in 1999 and 2001. The size of households ranges from one to ten persons. In an average household of four persons, all allocated pastureland has been enclosed by fences, over 40 percent of sandy land has been improved through planting or seeding, irrigated cropland has increased from 3 *mu* in 1980 to the current 15 *mu*, and the number of planted trees has increased from less than 200 to an average of 2,551 during the same period.

All of the intensive land use practices follow a general pattern of initiation in the 1950s and 1960s under the early socialist regime and rapid expansion since the 1980s. Pasture enclosure was first used in the 1960s, but its application was limited. After pastureland was distributed to households in 1983–1986, grassland fenced in by barbed wires became important not only for rotational grazing but also to protect pastureland from being used by other households. By the early 1990s, most usable pastureland was enclosed (Jiang, forthcoming). In general, each household has five to seven enclosures, divided according to seasonal uses, following a two- or three-season grazing system: lowland grass as cold season pasture and sandy shrub as warm season pasture; or lowland grass for spring and autumn grazing, sand-dune pasture for winter grazing, and upland pasture for summer grazing.

Tree, shrub, and grass planting has increased rapidly. As a result, the number of trees increased from 94 in 1958, all of which were around the Uxin Ju Temple, to 376,800 in 1992 (Uxin Ju Statistics 1998). In 1999 and 2001, about

Table 1. Household Land Use (Sample Size: 40)

Statistics	Standard Sheep Unit ^a	Standard Pasture ^b (mu)	Actual Pasture (mu)	Sandy land Improved (mu)	Irrigated Cropland (mu)	Planted Grass (mu)	Number of Planted Trees
Average	119	431	1,508	631	15	17	2,551
Min	27	100	270	0	0	0	30
Max	300	1,060	5,400	3,000	40	300	10,000
Standard deviation	65	192	1,435	839	9	14	2,955

^a Each sheep equals 0.9 standard sheep units, each cattle 6 units, and each pig 0.9 units.

^b The quality of pastureland varies greatly based on location. In grassland distribution, a standard pasture unit is used: 1 standard *mu* is equivalent to 100 kg of estimated dry biomass.

two-thirds of the households I interviewed had more than 1,000 trees. The tree species planted most frequently is the willow (*Salix matsudana*). When they reach a height of two to three meters, their branches are repeatedly cut to encourage the growth of new branches and tender leaves for forage. Shrubs are planted to improve the sandy land (Figure 2). Species such as *Salix psammophila*, *Hedysarum mongolicum*, *Artemisia ordosica*, and *Caragana spp.* are transplanted or seeded by airplanes. My interviewees indicated that improved sandy land ranges from 0–3,000 *mu* for each household, depending on various factors, including how much sandy land is allocated. Overall, 48 percent of allocated sandy land has been improved (see Jiang, forthcoming).¹¹ The leaves of these planted trees and shrubs have become an important source of high-quality forage for sheep and goats; thus trees are also called “pasture in the air.” The dry branches serve as fuel to supplement coal. With the help of planted vegetation and an enhanced economy, local people have stopped cutting natural shrubs for fuel, a common occurrence during the 1960s and 1970s that led to vegetation degradation. Grass has been planted in two ways: seeded together with shrubs through airplane seeding or planted on well-prepared low-lying (sometimes even irrigated) sandy land and harvested as winter forage. The species used include *Melilotus albus*, *M. sativa*, *M. suaveolens*, and *Astragalus adsurgens*.

Cropping existed in Uxin Ju long before 1949, but irrigation is relatively new. In 1969, irrigated fields comprised only 4 percent of the total cropland. By 1997, the irrigated acreage reached 10,207 *mu* out of a total cropland of 11,100 *mu*. In 2001, irrigation averaged 15 *mu* per household.¹² As Figure 3 shows, the reduction of dryland farming and an increase in irrigation went hand in hand, indicating a more intensified use. Prior to the 1970s, dryland farming served as the main cropping practice, which, facilitated by the dry, windy, and sandy environ-



Figure 2. Planted shrubs.

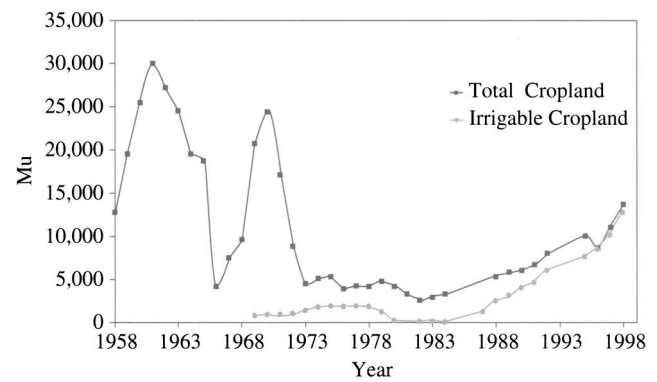


Figure 3. Change in cropland and irrigation.

ment, caused the sand to expand. Since the 1980s, with the introduction of well-digging techniques and made possible by the abundance of groundwater, irrigable cropland has increased rapidly. Crop varieties also expanded from the traditional crop of broomcorn millet to corn, potatoes, sunflowers, and vegetables (interviews, 1999, 2001).¹³

These new land-use practices discussed above form the basis of “family pasture,” a model of the new pastoral economy that has been promoted in Inner Mongolia since the 1990s. Family pasture is household based and market oriented. It includes five elements: fodder cultivation with irrigation, pasture improvement, vegetation protection, forage processing, and the use of mechanized equipment such as diesel engines and tractors. These elements form the basis of highly productive and hazard-resistant animal husbandry. According to the standard set by Inner Mongolia Autonomous Region, a family pasture unit should have 30 *mu* of forage cultivation and 9 *mu* of planted grass (both irrigated), 5,000–15,000 kg of green forage per year, 3,000 protective trees, over 50 percent of good breed sheep, about 20–30 sheep offtakes every year, and an income of over 750 yuan/capita. To do so, household members need to master proper agricultural techniques (Jiang 1999, 154). In Uxin Ju, although the amount of land cultivated and trees planted by a household does not reach the above standard, the spirit of pastoral management and development is the same.

Not only has land use become more intensive, the pastoral economy has also grown. Figure 4 shows two important measures of this growth: per capita net income and livestock death rates. The current per capita net income, although unadjusted for inflation, indicates an enhanced economy, which was confirmed as interviewees reported an increase of household durable goods and consumption. For example, motorcycles were rare in the 1970s and television sets were nonexistent, but by 2001,

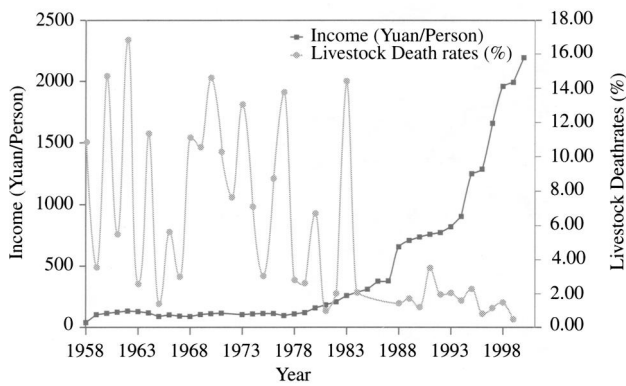


Figure 4. Changing pastoral economy: Per capita net income and livestock death rates.

about 40 percent of households owned a motorcycle and 70 percent had a television set. Annual meat consumption increased from 10 kg in the 1970s to 100 kg per person (interviews, 1998, 1999, 2001). The death rate of livestock indicates the economy's vulnerability to the shortage of cold season forage and natural disasters such as drought. Due to a high vulnerability, the death rate was high and highly variable before the 1980s. But it has since declined sharply and remained consistently low, pointing to the stability of the pastoral economy. One explanation for the low death rate is that more care is devoted to livestock husbandry by the households; another important reason has to do with the additional forage and feed provided by the cultivated crops and planted trees, shrubs and grass.

Changes in livestock, another aspect of the pastoral economy, are closely related to land use and pasture management. The decrease in total livestock numbers after the late 1980s, as shown in Figure 5, is attributed to three factors. First, during the 1970s, government policy emphasized livestock numbers, thus encouraging overstocking. Total livestock numbers increased rapidly from 49,977 in 1958 to a peak of more than 100,000 in the early 1970s. After the 1980s, emphasis was shifted to economic

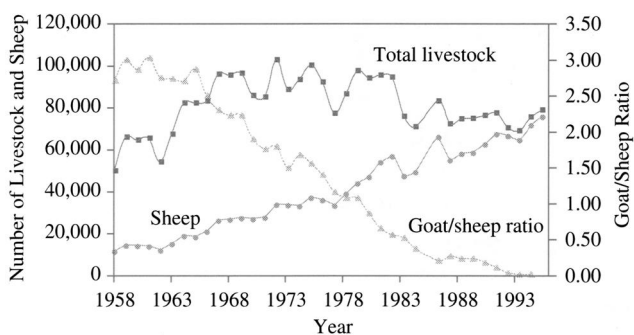


Figure 5. Change in livestock.

outcomes, which brought about a second reason for the lowering of livestock numbers: an increased offtake rate under the market economy. Compared with a less than 20–25 percent offtake before 1978, households now have a destocking ratio of 30–35 percent, 75 percent of which is sold to the market (interviews, 1999, 2001). The third reason has to do with the reduction of goats. Goats, a traditional livestock in Uxin Ju, are agile and adapt well to the coarse shrubs of the dry environment. They are highly resilient and so require less care. In the age of pastureland management and human intervention, however, these positive features of goats become their liability; they tend to overgraze the pastureland when overstocked and destroy the newly planted trees and shrubs. To protect pastureland, the goat population was reduced and improved-breed, fine-hair sheep were increased. In 1978, the goat–sheep ratio decreased to 1.08:1 from 2.7:1 in 1958 (Figure 5). By 1997, the total number of goats in Uxin Ju was only 324, while sheep numbered 68,934. While conversion from goat to improved sheep varieties increased labor requirements in disease prevention and fodder and feed provision, it also brought increased income from the selling of fine wool.

Land Use and Cultural Identity

Although some Mongols have become farmers in Inner Mongolia, for pastoral Mongols such as those in Uxin Ju, livestock grazing has been an important aspect of their Mongolian identity. During the 1950s, the Inner Mongolian regional government promoted livestock grazing as the “Mongolian economy” (Ulanhu 1990). Contrasting the Mongols with the Chinese, Lattimore (1940) considers them to be grazing and farming cultures. Clearly, land use is more than an issue of the economy and management of the environment—it also concerns cultural identities. How have the Mongols of Uxin Ju dealt with the issue of cultural identity as they adopt cropping and other intensive land use that are more “Chinese” than “Mongolian”? With such behavioral assimilation, have they, as some assert, become Chinese? To understand the issue of Mongolian cultural identity, I examined two factors that draw the Mongols away from grazing: farming and urban life.

Farming has exerted a significant influence on Mongolian culture. As discussed earlier, the Mongols actively seek to learn Chinese approaches to land management, and farming has become an important ingredient in the pastoral economy. Yet, some feel forced to farm—forced both by society at large and by their own desire for a better life. Barlaji, who was not only a pioneer in well digging but also among the first to cultivate corn, commented:

We feel cheated by the Chinese: our ancestors did not farm but now we are forced to farm. Farming is very hard. But if we go back to the grazing life of the past, I would not be used to its low standard of living any more. I am used to farming now—I have become an experienced farmer.

He said the last sentence only half mockingly. A lot is revealed in this brief quote. If cropping is “forced” upon them as Barlaji indicated, then it contradicts what he said later about not wanting to give it up. Although traditional sentiments still exist, it is the market forces that have come to dominate Mongolian life.

While some Mongols subscribe to Barlaji’s views, most interviewees were more accepting of farming and believe that farming is beneficial to livestock grazing. Corn cropping provides both forage (with its stalks) and feed (corn kernels) for livestock in the winter, the most vulnerable season for livestock. Tree and shrub planting serves a similar purpose by providing forage. Only a small percentage of households (5–10 percent), those with either fewer sheep or larger areas of irrigation, have been able to sell corn, thus making cultivation an activity independent of livestock rearing. In general, not only have cropping and planting not ended the practice of raising livestock, they have served to enhance it. Livestock rearing also helps cropping by providing animal dung as manure.

What has changed in livestock raising, however, is the way livestock is tended. In the past, livestock grazed on natural pastureland, and only limited human labor was required, mostly for grass cutting to feed the livestock in cold seasons. Now, significantly more labor is required to raise livestock, from grassland improvements to fence building, from cropping to caring for the more demanding livestock of improved varieties. Market-oriented practicality, however, has directed my interviewees to evaluate increased labor requirements against economic gain and regard it as a “necessary input” into the pastoral economy. Some, like Barlaji, complained that life was getting busier and that farming is hard, but others, such as Qiqige, believe that change such as this is a necessary part of society. She commented:

Society is changing, so many traditions have to be changed; [for example,] eating rice and accompanying dishes [the Chinese way] is better than drinking tea and eating millet [the Mongolian tradition]. As income increases, beliefs also have to change.

This attitude about change mirrors that of the larger Chinese society, which considers “change with time (*yu shi ju bian*)” as its motto in the era of globalization and modernization. Overall, whatever the level of acceptance of farming, all my interviewees have made farming an

important part of their future plans (interviews, 1998, 1999, 2001).

In addition to farming, urban influences from Chahanmiao Town provide another source of change for pastoral life. (Here, although urban influences do not come from the Chinese per se, they are often conceived as being more akin to the Chinese lifestyle and ideology than to those of the Mongols.) The town was established in 1996 in order to stimulate a local economy based on alkali resources extracted from the nearby Haotong-chahan Lake and a newly discovered natural gas reserve. For the people of Uxin Ju, Chahanmiao Town has come to represent the lure of the modern and serves as a symbol of the good life.¹⁴ Better material living conditions are the main attraction of Chahanmiao. Let me compare Uxin Ju and Chahanmiao. The center of Uxin Ju is the most concentrated living space in the rural area, populated by pastoralists and government staff. The total population is around several hundred. It has two stores selling everyday goods such as beer, soft drinks, school supplies, and clothing. The variety and style of goods in the stores remind me of the government supply shops operating during the commune era. The two family restaurants serve mainly guests of the local government—with a local style of cooking, such as mutton cooked with potatoes, and a local style of service (e.g., salted tea is served first). The area around the Uxin Ju Temple can be considered a public space where young men play pool. There is one privately operated phone booth that is usually closed. In Chahanmiao, by contrast, one finds a large variety of goods and supplies. Numerous restaurants and shops are found on the main street. The open market is crowded with stalls of vegetables, meats, clothes, and other household supplies. Spacious cinemas, libraries, and post offices create a world very different from the surrounding sparsely populated pastoral areas. Private phone booths are spaced regularly along the main street. Entertainment in the forms of movies, videos, and dance halls is abundant. With its floating population of nearly 10,000, mostly immigrants from outside the area, the town also provides a bustling diversity new to the pastoralists.

Modernity beckons to pastoralists from the town, which offers realistic opportunities for upward mobility. Lenient town regulations permit anyone who has lived there for more than six months to be a permanent resident. This is in stark contrast with other cities in China, which place strict limitations on immigration. It was with a hope for a better life that pastoralists like Barlaji and his family moved to the town.¹⁵ About 10 families from Barlaji’s home village (of approximately 70 households) have made the move, mostly those “whose minds are more flexible,” as he put it. Some have skills in repair work and carpentry, and some do manual labor such as feeding boilers. Barlaji

established a car wash business that relied mostly on manual labor.

Unlike Barlaji, most families remained in the pastoral area but sent their young daughters and sons to town—or rather, their daughters and sons decided to live in town. To most young people, pastoral life is limited and boring; the good life exists in the town. Due to abundant service-oriented business in Chahanmiao, it is easy for young women to secure jobs. Young men tend to work as short-term manual laborers. As a result, more young women than young men have moved to Chahanmiao, upsetting the ratio of males and females who are of marriageable age in the pastoral area. My interviews with several single men in their 20s and 30s revealed that there are not many single women of similar age available in the pastoral area. Of the five poor families I interviewed, three had 30- to 40-year-old sons who could not find local women to marry. As they remain single, their dream for a better future is frustrated. This is not to say that being single caused poverty for these men; rather, they were poor to start with and most have low-quality pastureland, and therefore they are disadvantaged when it comes to attracting women, who are in high demand. Mongolian women are known as hard-workers and tend to undertake more work in the household; single men thus do not benefit from valuable female labor in the family economic life. By attracting a large number of young women away from the pastoral area, Chahanmiao has become a threatening element to the social order of that area.

With farming and urban life attracting Mongols away from traditional nomadic grazing, how do they face the issue of cultural identity? During interviews, not a single Mongol viewed him- or herself as becoming less Mongolian because of these cultural changes. When I asked, “What do you think distinguishes the Mongols from the Chinese?” the following cultural features were the most frequently mentioned by my interviewees: the Mongolian language, the banner symbol that is hung in front of every Mongolian house (Figure 6), and the portrait of Genghis Khan.¹⁶ These responses are illuminating, given that livestock grazing, seen as the “Mongolian economy” just four decades ago, is no longer considered an important feature of the Mongolian cultural identity. It seems Mongolian identity is no longer linked with grazing or any particular types of land use, but with such symbolic features as language and heritage. Instead of emphasizing pastoralism, Mongols now focus on economic development, be it through grazing, cropping, or wage labor in the city or town. Economic development is seen as an important indicator of ethnic development (*min zu fa zhan*). This view is held not only by the Chinese government but also by Mongolian scholars (e.g., Bao,



Figure 6. Mongolian banner in the background of irrigated cornfield. The coexistence of the Mongolian banner and corn cultivation epitomized Mongolian cultural change.

Wang, and Wu 1997) and the Mongol pastoralists whom I interviewed.

This shift in the identification of the Mongolian culture can be understood as an active adjustment of Mongols to the rapidly changing society. Since all cultures change, often through interaction with the outside world or other cultures, it should not come as a surprise that Mongolian cultural practices have changed significantly during recent decades under economic reform. The Mongols are now livestock herders and farmers, as well as urban dwellers. Although government policies and the market economy during the reform era have hastened such change, the Mongols have been active agents in bringing about such transformations in land use and cultural identity. The shift in Mongolian identity toward the symbolic opens space for the Mongols to adopt new (mostly Chinese) land-use and other (such as dietary and housing) practices, while at the same time remaining Mongolian. In other words, the Mongols have used

intensive land-use practices, those influenced by the Chinese, as their own resources in order to gain economic benefits. Their shift to the symbolic in cultural identification makes their interactions with the Chinese and their adoption of new land-use practices culturally empowering.

Environmental Consequences

If economic-cultural transformations brought by land-use change has been largely positive, their environmental consequences are rather mixed. On the sandy dryland of Uxin Ju, as parts of the landscape are improved, other parts are sandified. The entire landscape has become more homogenized spatially; thus, its regenerative capacity is compromised. These landscape changes can be seen vividly from space on remote-sensing images. This section details the analyses of remote-sensing images and groundwater ecology that lead to the conclusion as summarized above. The implications of such environmental outcomes will be discussed.

Remote-Sensing Analysis

Given the rural nature of Uxin Ju, environmental change is measured through changes in vegetation, soil, and their spatial patterns. Remote-sensing images are used to detect change in land cover, which is then linked with land use and sandy-land ecology. With the unique sandy texture of land in Uxin Ju, one important indicator of vegetation and soil qualities and their change is the degree to which sand is activated, a process called "sandification." The degree of sandification is an easily recognizable land-cover characteristic on remote-sensing images. For this reason, I combine vegetation and soil change in my analysis of land-cover change.

Before discussing land-cover change, I introduce basic land-cover types. Uxin Ju's landforms consist primarily of sandy upland (*liang*) separated by depressed lowland (*tan*). Sand dunes are typically found between the uplands and lowlands as well as on the uplands. While shrubby species such as *Artemisia ordosica* and *Caragana spp.* can establish themselves on the sandy land, a considerable proportion of the landscape is covered by moving sand (Figure 7). Crescent-shaped sand dunes are often formed, arching toward the northwest, the direction of prevailing wind. *Salix psammophila* shrubs can be found on the lower leeward side of the dunes where water conditions are more favorable. On the lowland, water conditions are the most favorable, and one finds *Carex duriuscula* and *Achnatherum splendens* grassland, the best pasture. The human-made vegetation types, notably planted trees, shrubs, grass, and cropland, were introduced into the landscape



Figure 7. Uxin Ju's sandy landscape. You can see the mixture of shrubby vegetation and moving sand dunes.

after the 1950s and have become more important since the 1980s.

Remote-sensing images of 1973 (Multi-Spectral Scanner), 1986, and 1997 (Thematic Mapper) are used for this study. All natural land-cover types can be discerned on the 1973 images: typical and degraded *Artemisia* (and/or *Caragana spp.*) shrub, *Salix* vegetation, lowland *Carex* and *Achnatherum* grass, moving sand, and water bodies. Planted trees existed but were too patchy to be recognized with the images' 80 by 80 meter pixel resolution. Therefore, they are collapsed into typical shrubby vegetation. On the 1986 images, spatial resolution increased with their pixel size of 30 by 30 meters, and good quality *Salix* vegetation and trees are recognizable. On the 1997 images, one more vegetation type, cropland, can be found. All images are classified based on a supervised classification method.¹⁷ I focus on the following land-cover types in the analysis of landscape change: area and coverage of moving sand as measures of vegetation and soil degradation,¹⁸ and high-quality land-cover types (including typical *Artemisia* shrub, *Salix* vegetation, and human-produced vegetation types) as measures of vegetation and soil improvement. The aggregation of land covers compensate for the lack of accuracy caused by the omission of tree and cropland covers in the classifications of 1973 and 1986 images.

Figure 8 shows the results of the land-cover classification in the area surrounding the Uxin Ju center, and Figure 9 summarizes land-cover change from 1973 to 1997. The first category (in Figure 9), moving sand and bareland (most of which was moving sand activated on lowland), increased from 1973 to 1986 to 1997, indicating a trend of increase in sandification and degradation, especially between 1973–1986. A simultaneous process of vegetation improvement coexists, as is shown in the second and

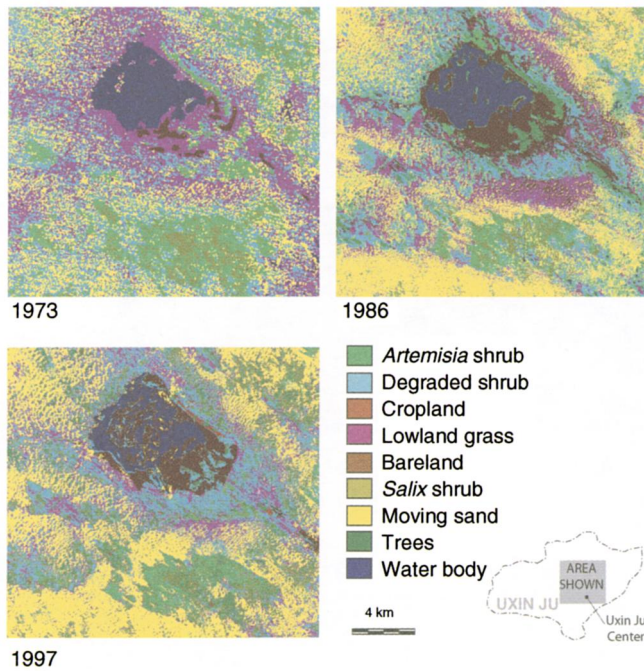


Figure 8. Land-cover change from 1973 to 1997.

third categories. Although good-quality vegetation remained about the same in the area, the most productive land covers (including trees, highly productive shrubs and cropland) increased significantly, especially between 1986–1997, corresponding with the period of rapid increase in planting and cropping. Overall, the landscape of Uxin Ju has experienced both degradation and improvement.

While the category of “water body” will be discussed later, the last category, “other,” includes degraded natural vegetation, or land cover of intermediate quality, with

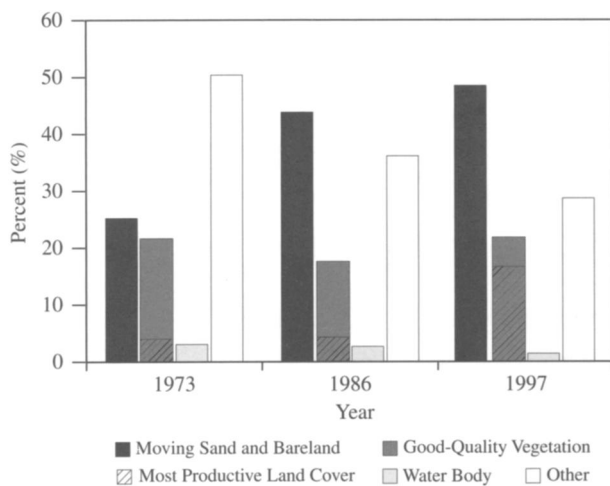


Figure 9. Land-cover compositions (percent) in Uxin Ju, 1973–1997.

moving sand on the one end and vegetation of high biomass on the other. This intermediate category has been reduced in area, while at the same time, land-cover types on both ends have increased. In other words, the landscape has become increasingly polarized into “good” and “bad” lands, with the production of biomass redistributed spatially in the process.

The spatial distribution of these “good” and “bad” lands has also become increasingly contiguous. Spatial patterns of the landscape are analyzed using a spatial-diversity measurement. It is derived by calculating the spatial richness of land-cover classes within a certain unit area, with the following equation (in a 7 by 7 moving window of image pixels):

$$\text{Diversity} = - \sum (p \cdot \ln p)$$

where p is the proportion of each class in the window, and \ln denotes a natural logarithm. The equation is similar to the Shannon entropy index (see Eastman 1997).

The analysis of the spatial-diversity measurement indicates a drastic decline from 1973 to 1997. Average diversity decreased from 0.86 in 1973 to 0.77 in 1986 and to 0.57 in 1997, and the histogram of spatial diversity became increasingly skewed to the left in comparison with a normal distribution, indicating an increase in areas of low spatial diversity. The decrease of spatial diversity is marked through sharpened boundaries between different land covers and larger contiguous coverage of the same cover type. The sharp boundaries around moving sand and green vegetation areas on the bottom part of the 1997 image can be observed in Figure 8. The landscape has become more homogeneous, a troublesome finding given that, in general, landscape of greater spatial diversity provides more opportunities for regeneration and is more resilient (Forman and Gordon 1986). Clearly, moving sand, if mixed with vegetation, has a better chance of being vegetated when precipitation is abundant, with annual species initially and perennial shrubs eventually taking root. As moving sand congregates spatially, the natural revegetative capacity is compromised, and more human effort is needed to revegetate moving sand.

Linking land cover with land use helps us understand the consequences of land-use practices and their change. The increase in human-improved land covers clearly relates to increased planting and cropping, but the increase in moving sand has more complicated causes. Frequent droughts in recent years¹⁹ and increased intensity in grazing after the pastureland was fenced (see Jiang forthcoming) have contributed to the expansion of sand. Indirectly, intensive land use, although bringing about environmental improvement in certain locations, has contributed to the expansion of sand in other

locations, causing unintended consequences. The mechanisms through which land improvement contributes to land degradation can be understood through the ecology of groundwater.

Linking Different Parts of the Landscape: The Ecology of Groundwater

Although poor in precipitation, Uxin Ju is rich in groundwater, which is contained in two aquifers, one shallow and one deep. Currently, shallow groundwater is accessed by most irrigation equipment. The main supply comes from precipitation; additions from other groundwater storages are only minor. The table of shallow groundwater is indeed shallow. In *tan* lowland, it can be as shallow as one to three meters from the surface. In *liang* sandy land, however, the groundwater table can be as deep as 10 meters or more. Uxin Ju does not have surface water outlets, and precipitation either evaporates or infiltrates the sandy soil, seeping into the groundwater. Some precipitation remains in lakes and seasonal water bodies connected to groundwater. The rich supply of groundwater enables the new and intensified land-use practices to occur. As a semiarid area, Uxin Ju's environment could not support the concentrated planting of trees, shrubs, grass, and crops if it were not for its rich groundwater. This groundwater supply is probably the single most important feature of the landscape that has enabled the land-use change to occur.

Through groundwater, different parts of the landscape are connected. As discussed earlier, the Uxin Ju landscape is becoming increasingly polarized, with an increase of both sandy land and highly productive vegetation types. The two seemingly divergent phenomena are, in fact, closely connected through groundwater. As tree and shrub planting and crop irrigation increased rapidly, the use of groundwater was greater than its rate of replenishment. As a result, the groundwater table has been gradually reduced. On sandy land, the groundwater table was deep to start with and has now been lowered even further. The water-sensitive *Salix* vegetation on the lower leeward of the sand dune has slowly died off, enabling the sand to be activated and areas of moving sand to increase. This expansion of sand has been further exacerbated by an increase in grazing intensity. Sandy areas thus become more contiguous, and the landscape increasingly homogeneous. The dual process of improvement and sandification suggests that in Uxin Ju, if certain landscapes are improved, certain other landscapes will be deprived and degraded. It further suggests that the more humans attempt to improve the land, the more polarized the landscape will become.

No systemic study has been conducted on the change of the groundwater table in Uxin Ju; however, indirect evidence is comprehensive enough to suggest its occurrence. The first such evidence concerns the reduction of water bodies on the land surface. Figure 9 shows that area of water bodies continuously decreased from 1973 (5,326 ha) to 1986 (4,610 ha) and to 1997 (2,433 ha). These water bodies are connected with the shallow groundwater (i.e., the groundwater table is the same as the level of surface water), so their reduction indicates the lowering of the groundwater table. The second kind of evidence comes from field interviews. Most interviewees had noticed the reduction of surface and groundwater in the *tan* lowland. One person described his own experience as follows:

When I was small [in the early 1970s], I used to graze sheep in the *tan* lowland. When I was thirsty, I would dig a hole into the sand with my hands and wait for 10–15 minutes, and clear water would accumulate. Now you cannot dig water with your hands anymore [on the same location]—not even with shovels.

The lowering of the water table by two to three meters in irrigation wells has been observed widely.

The intensified water-consuming land-use practices have been sustained by the landscape so far. Because groundwater reduction is a very recent phenomenon, local people have not recognized it as a serious problem. Local government leaders and pastoralists alike are sanguine about the current and future use of groundwater. Similarly, sandification is not recognized as an inevitable result of land intensification. Most pastoralists I interviewed saw their futures as based on increased land intensification as well as sand control. Local leaders were even more optimistic about the potential of the landscape. If the current trend in land use continues, however, groundwater reduction will be worsened. Eventually, a critical state of water availability will be reached, making current land use practice impossible to sustain. As Uxin Ju joins with many of the world's drylands in its experience of land-use-induced groundwater depletion (e.g., Chandrakanth and Romm 1990; Al-Ibrahim 1991), lack of awareness of the situation will only exacerbate the problem.

Understanding Environmental Change

The paradoxical environmental outcome in Uxin Ju throws into question the long-term sustainability of the current trend in land-use and cultural change. In modern times, the human–environment relationship has not been symmetrical. Humans have played a dominant role, changing and controlling the processes and production of the ecosystem (Turner et al. 1990; Kasperson, Kasper-

son, and Turner 1995). Uxin Ju is no exception. Given increased human capacity to modify the environment, nature is seen as having a flexible and stretchable limit, one that is often overestimated. Adaptation has not prioritized the environment but has responded to socio-economic and cultural changes, such as market demands and the influence of outside technologies and values. Economic-cultural adaptations may not be, and often times are not, consistent with the health of the environment. Thus, environmental damages may result. In Uxin Ju, such damages come mixed with environmental improvement, making it harder for the local inhabitants to perceive nature's limitations.

However extendable by technology, nature does hold its limit, and nature's ecologies work consistently, if only quietly. As a result, even as humans attempt to improve the environment, unintended negative outcomes may occur—have occurred in Uxin Ju—through ecological processes. Therefore, human use has to be constantly adjusted in order to sustain the long-term productivity of the environment. Socioeconomic and cultural forces driving land-use change follow certain progressive trends, however, making environmentally sound land-use adjustment difficult, if not impossible. This difficulty speaks to the fundamental dilemma human societies face in relating to the environment.

Conclusion

In this article, I have examined the dynamics of Mongolian interaction with the Chinese state and the Han Chinese people in affecting land use, cultural identities, and the environment in Uxin Ju, a Mongol-dominated border area in China. Since the 1980s, in the context of China's economic reform, new and intensified land-use practices such as tree and shrub planting, cropping, and irrigation have increased rapidly. At the same time, the identification of the Mongolian culture has shifted from material practices, especially land use, to symbolic features—the Mongolian language and ancestry. Not only is land-use change encouraged by the Chinese state, most of the newly adopted land-use practices are also associated with the Chinese, either directly through technology or indirectly through ideology. The Mongols have utilized their access to Chinese technology and laborers to their own advantage in bringing about land-use change that helps strengthen their economic well-being.

Land-use change has brought about both improvement and degradation to the environment. Although such mixed consequences make an evaluation difficult, it is clear that the increase in moving sand reduces pastureland

for grazing, the homogenization of the landscape undermines the natural revegetation, and the reduction of groundwater level signifies a potential problem in the long run. The landscape holds a limit to human exploitation. The Mongols in Uxin Ju have come to contend with such a limit, and the results have favored the human economy over nature's renewal. It remains an important question whether, and especially how long, the environment can support the current trend of intensive land use.

An important theme in this study is the relationship among cooperation, power, and the environment. In exploring local initiatives in land-use change, I highlighted the importance of the Mongols' cooperative relationships with the Chinese state and the Han Chinese people. Since the 1980s, modernization and intensive land use have not only been promoted by the Chinese government but they have also been actively pursued by the Mongols in Uxin Ju. The Mongols want and welcome modernization. This is not to say that they have always agreed with the government; in fact, many complained about corrupt and unfair governmental officials. But those problems have not undermined the Mongols' active adoption of new land-use practices. Problems and drawbacks of China's privatization notwithstanding (e.g. Hinton 1990), the Mongols have welcomed the policies as a means to achieve a better life. Their participation in economic modernization renders the notion of "local resistance to the state" inadequate. They also strongly desire to be integrated into the market, a factor that has become the most important consideration for the Mongols in planning their household economy. In pastureland improvement, a majority of my interviewees expressed their desire for more government investment in tree/shrub planting in order to improve the sandy land. The Mongols of Uxin Ju want more of what the government promotes, not less. They are active pursuers of new land-use practices, rather than slaves of the state policies. Given their own initiatives and desires, they have to be seen as co-creators of their own life and environment. Therefore, their responses to government policies have to be seen as signs of their active cooperation, rather than co-optation.

The Mongols' cooperative relationship with the Chinese has also been crucial to land-use change in Uxin Ju. This article has focused on the Mongols, and my research on the Chinese in an adjacent location found a similar level of mutual learning and benefit. While some scholars view the Mongolian–Chinese relationship primarily as a power relation in which the Mongols are the losers, my empirical study in Uxin Ju shows that this image is misleading. Historically, Uxin Ju has not been a "pure" Mongolian place, but a place of mixed life and technology (Lattimore 1940, 481–83). During the period studied,

the Mongols have benefited from communication with the Chinese in the pursuit of land-use expansion, and Chinese laborers working for the Mongol households dispel the image of the Mongols as subordinates. While the Mongolian–Chinese cultural mixing has been enhanced in the age of modernization, at the same time, both peoples have been influenced by new technologies (such as the surface-filming cropping technique) that are neither traditionally Chinese nor traditionally Mongolian. Uxin Ju is a border not only between the Chinese and Mongols, but also between tradition and modernity. As a borderland, Uxin Ju cannot be reduced to any single ingredient in its hybridized culture and landscape; any attempt to do so would only dilute the rich Mongolian life. Indeed, the very mixture is Mongolian, embodying all forces at work. The Mongols are border-crossers, expanding to embrace land-use practices from outside its traditional stores.

The cooperation of the Mongols in Uxin Ju has to be understood in the context of Mongolian cultural change. All cultures change; the process of modernization further accelerates such changes. Given the profound transformation of the society and landscape, which Uxin Ju has experienced in the last two decades, it is imperative that we as scholars do not take the Mongols and their culture hostage to the past (see Rosaldo 1993). Rather, we have to attend to changes in both material and symbolic practices. For example, although nomadic grazing was deemed the most important aspect of Mongolian culture in the past, it fails to identify the modern Mongols. Instead of land use, Mongols seek to identify Mongolian culture through such symbolic features as language and heritage. Through shifting meanings attached to land-use practices, they have effectively maintained their Mongolian cultural identity, making land-use adoption a means of empowerment rather than a sign of colonization and oppression. In the face of changing material practices, the “local” or “indigenous” is maintained in the symbolic.²⁰ The Mongols’ changing cultural identification also helps us understand that their cooperation is a strategy through which they gain power culturally, economically, and symbolically. This speaks to the changing meanings of both the material and the symbolic (Moore 1996). Both have to be viewed as being more fluid than historical sediments since both can be reworked and reinterpreted to serve current needs.

Implications of this study for political ecology are threefold. First, to engage in a diverse set of politics, political ecology needs to pay more attention to cooperative relationships and their environmental consequences. Here, cooperation has to be assessed based on voluntarism and local initiatives. Such cooperation can be the most

effective way to gain local power. It often involves changes in both material and discursive processes, thus leading to profound social-environmental change. For such a cooperative relationship to exist, there has to be a social-political situation that allows the locals “room-for-maneuver” (Bebbington 2000) instead of extreme oppressive situations under which the only alternative to local resistance is social and environmental destruction. In post reform China, the loosening of central control has allowed the locals considerable power to influence land use and the environment, and it is my hope that globalization, with all its drawback and negative impacts, may help local people in many places around the world gain the power to determine their own lives. Expanding into the politics of cooperation enhances the ability of political-ecological studies to explore human–environmental change under various state and local conditions.

Second, if environmental sustainability is to be achieved, the state has to be relied on rather than abandoned. Given political ecology’s critical view of the state, it is not surprising that state policies are often perceived to be at odds with local cultures and desires. While local resistance to state policies often occurs, it cannot be assumed a constant reality in all locations. Not only does the state not have to be an “enemy” (Moore 1996), it can also be a constructive force, and the political, administrative, and financial power of the modern state has to be called upon in order to protect the environment (see also, Buttel 1998). Culturally, there exists a wide array of conceptions about the state due to the diverse histories of different peoples. In traditional Confucian thought, the state held the ultimate authority as the mandate of heaven vested in the emperor. Although the throne was not always occupied by a sage, this ideal remained significant in the Chinese mind. Even today, the Chinese tend to look upon the state as able to see correctly and to do right. More often than not, they seek to cooperate with the state. Traditional Mongols had a similar desire to follow a heavenly mandated heroic leader to harmony and happiness (Wuyunbatu and Gegengaowa 2001). In Uxin Ju today, the Mongols have welcomed the post-reform policies and considered the state as a valuable financial and organizational resource for the development of this pastoral area.

Lastly, a form of politics is not invariably linked to one particular environmental outcome; local cooperation does not imply environmental sustainability. The coexistence of improvement and degradation is not unique to Uxin Ju, but common in human–environmental interactions (Blaikie and Brookfield 1987). If we take the view that environmental degradation is targeted to the less powerful group in a power differential, then the Mongols would be

the bearers of degradation, which would have been brought on by the Chinese state and Chinese people, considered the more “powerful” entity and group. In addition, the Mongols’ cooperation, instead of resistance, would further exacerbate the destruction of the environment. These speculations, however, have not borne out in this study. In Uxin Ju, while the state’s single-minded economic pursuit in environmental management has led to negative environmental consequences, local cultural change and limitations in local environmental knowledge have also contributed to environmental degradation. In the meantime, both the state and the local people have attempted to improve the environment—indeed, the degradation is partly an unintended result of such an attempt. This complicated situation makes the identification of “the destroyer” of the environment a daunting task, and it challenges researchers to ground any broad-based theories of the human–environment relationship in empirical realities of a region.

Acknowledgments

Financial support for this research was provided by University of Iowa (Central Investment Fund for Research Enhancement), University of Wisconsin at Madison (Graduate School Research Fund), and Beijing Normal University (a visiting scholarship at the Key Laboratory of Environmental Change and Natural Disaster). The Cartography Lab at University of Wisconsin at Madison assisted in making graphics. I thank the many inhabitants in Uxin Ju who have helped me understand their life and landscape. I am grateful to Yi-Fu Tuan and Robert Sack, who have inspired this work, provided stimulating discussions, and commented on early versions of the manuscript. Many thanks to Roger Kasperson, William Cronon, Karl Zimmerer, Matt Turner, Leila Harris, Karl Ryavec, and the anonymous reviewers for their insightful comments and constructive suggestions on previous drafts. Richard Hennessey provided crucial support and helped in the editing. My special thanks go to Jeanne Kasperson, whose hand-written comments on an early draft serve for me a warm memory of her encouragement and inspiration.

Notes

1. It is important to recognize that humans not only degrade the environment but also improve it (Fairhead and Leach 1996; Zimmerer 1996; Brookfield 2001). Scholarship on China’s human–environmental change during the reform era points to opposite assessments of decline and improvement. Muldavin (1997), for example, maintains that private land use initiated by economic reform caused a breakdown of

collective infrastructure in agricultural areas and an increase in peasants’ discontent and environmental degradation. Williams (1996, 2001) presents a case of social and ecological decline brought about by grassland privatization. Ross (1987, 1988) and Smil (1984, 1993), although aware of China’s effort to reduce chemical pollution in urban areas, believe that the rural problem of land degradation has been exacerbated by reform policies. Others scholars, however, assert that postreform social–environmental change has been one of improvement. Runnastrom (2000), for example, through remote-sensing analysis, concludes that tree cover has increased in the Ordos region. A number of Chinese scholars agree with the assessment of environmental improvement during the reform era (e.g., Lu et al. 1996; Guo and Wang 1998). These different social–environmental scenarios demonstrate what Muldavin (2000, 267) calls “a diverse range of environmental outcomes” based on local socio-economic and environmental processes. Decentralization since the 1980s has enhanced cultural, historical, and environmental heterogeneity, making generalizations of environmental outcomes difficult (Oakes 1996). My research findings in Uxin Ju fall between the two poles of environmental degradation and improvement, thereby adding to the existing scholarship on China’s postreform socioenvironmental change.

2. The selection process is close to but not strictly stratified random. In choosing households from each category of economic status, poor transportation conditions dictated that I select households that were relatively easier to access by a local jeep.
3. I speak Chinese but not Mongolian. All Mongols in Uxin Ju can speak some Chinese but most are more comfortable speaking Mongolian. For this reason, I solicited the help of a Mongolian–Chinese interpreter. Although my direct communication with the informants was compromised, the interpreter’s translation gave me time to take notes and formulate my responses without interrupting the flow of conversations.
4. *Banner*, *sum*, and *gacha* are all administrative units, equivalent of county, township, and village, respectively. Uxin Ju is a *sum*-level administrative area.
5. Only those who are considered “rural residents” have been contracted pastureland. In 1992, Chinese accounted for only 10 percent of the total population. A later increase in the Chinese population came from immigrants who work in the town of Chahanmiao. These immigrants do not have access to use the pastureland.
6. Some scholars assert that the Chinese socialist state has oppressed the Mongols in Inner Mongolia and degraded its environment (Sneath 2000; Williams 2001). While this has been largely true historically (see Lattimore 1932, 1940), the Mongols during the reform era have utilized Chinese state policies and their access to Chinese technologies for their own benefit in bringing about desired land-use and economic change. Uxin Ju does not easily fit within the theory of marginalization as postulated by the neo-Marxist politico-economic analysis (Watts 1983; Susman, O’Keefe, and Wisner 1983), nor does it reflect the premise of liberation as alleged by the Chinese government. Given such complicated historical dynamics, the Mongols’ collaborative relationship with the Chinese state and people as presented in this article should be understood as a predominant phenomenon occurring during the postreform era, rather than a general historical reality.

7. The *mu* is a Chinese areal measurement unit; 15 *mu* = 1 hectare.
8. In the study of pastoralism, mobility is seen as power and a sign of freedom. Part of the power of mobility is the opportunity it allows for “transcultural conversations” (Tsing 1993, 150). Mobility’s pros and cons aside, it is not a precondition for cultural conversation in Uxin Ju. In fact, because of the need to adopt new land-use practices, transcultural communication and interaction have become even more crucial and intense for the sedentarized Mongols in Uxin Ju.
9. Farming is not a new phenomenon in Inner Mongolia. The cultivation of the Inner Mongolia grassland started in the Han Dynasty (206 BCE–220 BCE); since the Ming Dynasty (1366–1644), Chinese control has accelerated the conversion of grassland into cropland. By 1949 when the Communists took over, about 20 percent of Mongols were farmers, and altogether farming was already a significant part of the economy for three-quarters of Mongols.
10. I did visit Taoli and Henan during the summer of 2000, and Manduhu’s remark was confirmed. In Taoli, for example, land use and the economy are similar to Uxin Ju, but the scale is larger: each household owns more sheep, has larger pastures, and some have up to 50 *mu* of irrigated cropland. Long-term, live-in laborers have become a new phenomenon. Most Mongols there are fluent in Chinese, the language in which interviews were conducted.
11. This percentage does not include sandy wasteland, the improvement rate of which is much lower. Furthermore, planting is only applied to sandy land; lowland grass provides much better pastures, and the only improvement measure there is enclosure. Therefore, households that received more lowland pasture have small areas of improved planting.
12. It is noteworthy that in China’s farming areas, average cropland per household is less than 8 *mu* (Liu 1992). In comparison, land resources in Uxin Ju are abundant.
13. About half of the irrigated field is devoted to corn, 35 percent to broomcorn millet, a traditional food. The remaining 15 percent is planted sunflowers, potatoes, and vegetables.
14. In China, the city and the countryside have been positioned opposite to each other, with the former representing a life of progress and material abundance, and the latter a site of backwardness and poverty. During the 1960s and 1970s, eliminating the urban–rural divide was one of the goals of the socialist regime. The divide remains, however, and for the upwardly mobile country dwellers, one sure place to go is the city.
15. They moved to the town in 1997 and later moved back to their pastoral home in 1999.
16. Hospitality was also mentioned as a Mongolian cultural tradition that has been well maintained since the 1980s. “It is easy to serve mutton meat to guests now” and “gift-giving is made easier” were among my interviewees’ comments. Underlying the recognition of hospitality is the view that Chinese are less hospitable, especially to strangers.
17. Training sites were collected during 1998 and 1999. Partial accuracy assessment was conducted based on the sampling of 50 locations in 2001. Since land covers are considerably diverse on the sandy land, instead of checking for a single land cover, I documented land cover patterns around each site, against which the classification image of 1997 was compared. Seven of 50 sites, or 14 percent, were inaccurately classified, 6 of which involved lowland pasture on the ground, which was incorrectly classified into various classes of shrub—*Salix* shrub, typical *Artemisia* (and/or *Caragana*) shrub, and degraded shrub—in descending qualities. On one site, plantings of medicinal herbs were classified into tree cover. All cases of incorrect classification, however, were assigned the correct correspondent land cover with regard to quality. For example, degraded lowland pasture was assigned “degraded shrub” and good-quality lowland pasture was assigned “*Salix* shrub” or “typical shrub.” Given that the misclassification is spatially continuous over large areas, it has minimal impact on the calculation of spatial diversity. In light of my aggregation of land covers based on qualities (see Figure 9), the misclassification does not have any significant impact on the analysis of land cover change. As for the accuracy of the 1973 and 1986 images, given the high degree of mobility of the sandy land and changes in land cover, they cannot be assessed in the field. I did, however, compare the classification results of the 1986 images with an existing vegetation map of Uxin banner compiled in 1987. This vegetation map covers a much larger area; therefore, it was highly generalized. The general pattern of land cover, however, is consistent with my classified map. The last source for accuracy assessment was visual interpretation. Although it has largely been abandoned with the advent of digital processing technology, visual interpretation is very useful in this study, especially for sand dunes, which are clearly recognizable visually on the composite images. Visual comparison confirms the consistency of sand cover between the composite images and classified results.
18. Given the dry climate and sandy soil, moving sand dunes are a natural part of the landscape. They became a sign of degradation only after human activities caused their areal expansion.
19. My analysis, however, does not support a clear trend of desiccation: the linear regression between annual precipitation and time (year 1970–1997) yields a coefficient of only -0.0063 .
20. Not all Mongolian cultural practices have given way; some remain and are even enhanced in the reform era. For example, hospitality, an important Mongolian tradition, has expanded rather than contracted in recent years (see note 16), and my interviewees attribute this expansion to a better economic life.

References

- Agrawal, A. 1998. *Greener pastures: Politics, markets, and community among a migrant pastoral people*. Durham, NC: Duke University Press.
- Al-Ibrahim, A. A. 1991. Excessive use of groundwater resources in Saudi Arabia: Impacts and policy options. *Ambio* 20 (1): 34–37.
- Axelrod, R. 1984. *The evolution of cooperation*. New York: Basic Books.
- Bao, Q., G. Wang, and J. Wu. 1997. *Cao yuan sheng tai jing ji xie tiao fa zhang* (Coordinated development of grassland ecological economy). Hohhot: Nei Meng Gu Ren Min Chu Ban She (Inner Mongolia People’s Press).
- Bassett, T. 1988. The political ecology of peasant-herder conflicts in the northern Ivory Coast. *Annals of the Association of American Geographers* 77 (3): 453–72.

- Bebbington, A. 2000. Reencountering development: Livelihood transitions and place transformation in the Andes. *Annals of the Association of American Geographers* 90 (3): 495–520.
- Behar, R., and D. Gordon, eds. 1995. *Women writing culture*. Berkeley: University of California Press.
- Bilik, N. 1996. Culture, the environment, and development in Inner Asia. In *Culture and environment in inner Asia*, ed. C. Humphrey and D. Sneath, vol. 2, 134–46. Cambridge, U.K.: The White Horse Press.
- . 1998. Language education, intellectuals and symbolic representation: Being an urban Mongolian in a new configuration of social evolution. *Nationalism and Ethnic Politics* 4 (1-2): 47–67.
- Blaikie, P. 1985. *The political economy of soil erosion in developing countries*. London: Longman.
- Blaikie, P., and H. Brookfield. 1987. *Land degradation and society*. London: Methuen.
- Brookfield, H. 2001. *Exploring agrodiversity*. New York: Columbia University Press.
- Bryant, R. L., and S. Bailey. 1997. *Third world political ecology*. London: Routledge.
- Buttel, F. H. 1998. Some observations on state, world orders, and the politics of sustainability. *Organization and environment* 11 (3): 261–86.
- Chandrakanth, M. G., and J. Romm. 1990. Groundwater depletion in India: Institutional management regimes. *Natural Resources Journal* 30 (3): 485–501.
- Clifford, J., and G. E. Marcus, eds. 1986. *Writing culture: The poetics and politics of ethnography*. Berkeley: University of California Press.
- Eastman, J. R. 1997. *IDRISI for Windows user's guide*. Worcester, MA: Clark Labs, Clark University.
- Fairhead, J., and M. Leach. 1996. *Misreading the African landscape*. Cambridge: Cambridge University Press.
- Forman, R. T. T., and M. Gordon. 1986. *Landscape ecology*. New York: Wiley.
- Galaty, J. G., and D. L. Johnson, eds. 1990. *The world of pastoralism: Herding systems in comparative perspective*. New York: The Guilford Press.
- Gaubatz, P. R. 1996. *Beyond the Great Wall: Urban form and transformation on the Chinese frontier*. Stanford, CA: Stanford University Press.
- Giddens, A. 1984. *The Constitution of society: Outline of the theory of structuration*. Berkeley: University of California Press.
- Guo, T., and C. Wang. 1998. San bei fang hu lin ti xi jian she 20 nian zong shu (Overview of 20-year three-north protection forest project). *Lin Ye Jing Ji (Forest Economy)* 6: 1–13.
- Han, A. X. 1999. *Split identities: Making minzu/ethnic subjects in Inner Mongolia, People's Republic of China*. Ph.D. dissertation, University of Washington.
- He, M. 2001. Ne meng gu ren kou fa zhan guo cheng de fen xi ji yu ce (Analysis and prediction of population development in Inner Mongolia). *Nei Meng Gu Shi Fan Da Xue (Journal of Inner Mongolian Normal University)* 30(1): 17–21.
- Hinton, W. 1990. *The great reversal: The privatization of China, 1978–1989*. New York: Monthly Review Press.
- Howitt, R. J. Connell, and P. Hirsch, eds. 1996. *Resources, nations and indigenous peoples: Case studies from Australasia, Melanesia and Southeast Asia*. Melbourne: Oxford University Press.
- Jagchid, S., and V. J. Symons. 1989. *Peace, war, and trade along the Great Wall: Nomadic-Chinese interaction through two millennia*. Bloomington: Indiana University Press.
- Jiang, H. 1999. *The Ordos Plateau of China: An endangered environment*. Tokyo: United Nations University Press.
- . Forthcoming. Fences, ecologies, and changes in pastoral life: Sandy land reclamation in Uxin Ju, Inner Mongolia, China. In *Globalization and geographies of conservation*, ed. K. S. Zimmerer. University of Minnesota Press.
- Kasperson, J. X., R. E. Kasperson, and B. L. Turner II, eds. 1995. *Regions at risk: Comparisons of endangered environments*. Tokyo: United Nations University Press.
- Khazanov, A. M. 1994. *Nomads and the outside world*, Trans. J. Crooken. 2nd ed. Madison: University of Wisconsin Press.
- Lattimore, O. 1932. Chinese colonization in Inner Mongolia: Its history and present development, 288–312. *Pioneer Settlement* (n.p.).
- . 1940. *Inner Asian frontiers of China*. Boston: Beacon Press.
- . 1962. *Nomads and commissars: Mongolia revisited*. New York: Oxford University Press.
- Liu, F. 1992. Nong cun gai ge de xin fang an (*New strategies for rural reform*). Beijing: Zhong Guo Shang Ye Jing Ji Chu Ban She (Chinese Finance and Economy Press).
- Liu, M., and Y. Wang. 1998. Yikezhao meng cao kulum jian she he li yong diao cha bao gao (Report on grassland enclosure and grassland use in Ih-Ju League). *Neimenggu Cao Ye (Grassland Industry of Inner Mongolia)* No. 2: 17–19.
- Longworth, J. W., and G. J. Williamson. 1993. *China's pastoral region*. Canberra, Australia: CAB International.
- Lu, Y., H. Liu, Q. Meng, X. Zhao, and X. Zhu. 1996. Jiling sheng xi bu sha hua tu di chi xu nong ye ti xi jian li de shi jian (The practice of building sustainable agricultural system on the sandy land in western Jilin Province). *Zhongguo Sha Mo (Journal of Desert Research)* 16 (2): 185–90.
- Moore, D. S. 1996. Marxism, culture, and political ecology. Environmental struggles in Zimbabwe's eastern highlands. *Liberation ecology*, ed. R. Peet and M. Watts, 125–47. London: Routledge.
- . 1999. The Crucible of cultural politics: Reworking “development” in Zimbabwe's eastern highlands. *American Ethnologist* 26 (3): 654–89.
- Morgan, D. 1986. *The Mongols*. Cambridge, MA: Blackwell Publishers.
- Muldavin, J. S. S. 1997. Environmental degradation in Heilongjiang: Policy reform and agrarian dynamics in China's new hybrid economy. *Annals of the Association of American Geographers* 87 (4): 579–613.
- . 2000. The paradoxes of environmental policy and resource management in reform-era China. *Economic Geography* 76 (3): 244–71.
- Oakes, T. 1996. Eating the food of the ancestors: Place, tradition, and tourism in a Chinese frontier rover town. *Ecumene* 6 (2): 123–45.
- Peet, R., and M. Watts. 1996. *Liberation ecologies*. London: Routledge.
- Peluso, N. L. 1992. *Rich forests, poor people: Resource control and resistance in Java*. Berkeley: University of California Press.
- Richards, P. 1985. *Indigenous agricultural revolution: Ecology and food production in West Africa*. Boulder, CO: Westview Press.
- Rosaldo, R. 1993. *Culture and truth: The remaking of social analysis*. Boston: Beacon Press.
- Ross, L. 1987. Environmental policy in post-Mao China. *Environment* 29 (4): 12–17, 34–39.

- . 1988. *Environmental policy in China*. Bloomington: Indiana University Press.
- Runnastrom, M. C. 2000. Is northern China winning the battle against desertification? Satellite remote sensing as a tool to study biomass trends on the Ordos Plateau in semiarid China. *Ambio* 29 (8): 468–76.
- Scott, J. C. 1985. *Weapons of the weak: Everyday forms of peasant resistance*. New Haven, CT: Yale University Press.
- Smil, V. 1984. *The bad earth: Environmental degradation in china*. London: Zed Books.
- . 1993. *China's environmental crisis: An inquiry into the limits of national development*. Armonk, NY: East Gate.
- Sneath, D. 2000. *Changing Inner Mongolia: Pastoral Mongolian society and the Chinese state*. Oxford: Oxford University Press.
- Susman, P., P. O'Keefe, and B. Wisner. 1983. Global disasters, a radical interpretation. In *Interpretations of calamity*, ed. K. Hewitt, 263–83. Boston: Allen & Unwin, Inc.
- Tseren, P. B. 1996. Traditional pastoral practice of the Oirat Mongols and their relationship with the environment. In *Culture and environment in inner Asia*, ed. C. Humphrey and D. Sneath, vol. 2, 147–59. Cambridge, U.K.: The White Horse Press.
- Tsing, A. L. 1993. *In the realm of the diamond queen: Marginality in an out-of-the-way place*. Princeton: Princeton University Press.
- Turner, B. L., II, W. C. Clark, R. W. Kates, J. F. Richards, J. T. Mathews, and W. B. Mayer, eds. 1990. *The earth as transformed by human action*. New York: Cambridge University Press.
- Turner, M. D. 1999. Merging local and regional analyses of land-use change: The case of livestock in the Sahel. *Annals of the Association of American Geographers* 89 (2): 191–219.
- Ulanhu 1990. *Wulanfu lun mu qu gong zuo (Ulanhu's talks on pastoral work)*, compiled by Temuer et al. Hohhot: Nei Meng Gu Ren Min Chu Ban She (Inner Mongolia People's Press).
- Uxin Ju Statistics. 1998. *Wu shen zhao tong ji shu ju (Uxin Ju Statistical data)*. Unpublished government archive.
- Vayda, A. P. 1983. Progressive contextualization: Methods for research in human ecology. *Human Ecology* 11 (3): 265–81.
- Walker, K. J. 1989. The state in environmental management: The ecological dimension. *Political Studies* 37:25–38.
- Watts, M. 1983. On the poverty of theory: Natural hazards research in context. In *Interpretations of calamity*, ed. K. Hewitt, 231–62. Boston: Allen & Unwin, Inc.
- Williams, D. M. 1996. The barbed walls of China: A contemporary grassland drama. *The Journal of Asian Studies* 55 (3): 665–91.
- . 2001. *Beyond the Great Wall: Environment, identity, and development on the Chinese grasslands of Inner Mongolia*. Stanford, CA: Stanford University Press.
- Wuyunbatu and Gegengaowa. 2001. *Meng gu zu chuan tong wen hua lun (On the traditional Mongolian culture)*. Hohhot: Yuan Fang Chu Ban She (Border Press).
- Zhang, C. 1990. Review of wool production and wool requirements in China. In *The wool industry in China*, ed. J. W. Longworth, 8–23. Mount Waverley, Australia: Inkata Press.
- Zimmerer, K. S. 1996. *Changing fortunes. Biodiversity and peasant livelihood in the Peruvian Andes*. Berkeley: University of California Press.

Correspondence: Department of Geography, 384 Science Hall, University of Wisconsin, Madison, WI 53706, email: hjiang@geography.wisc.edu.