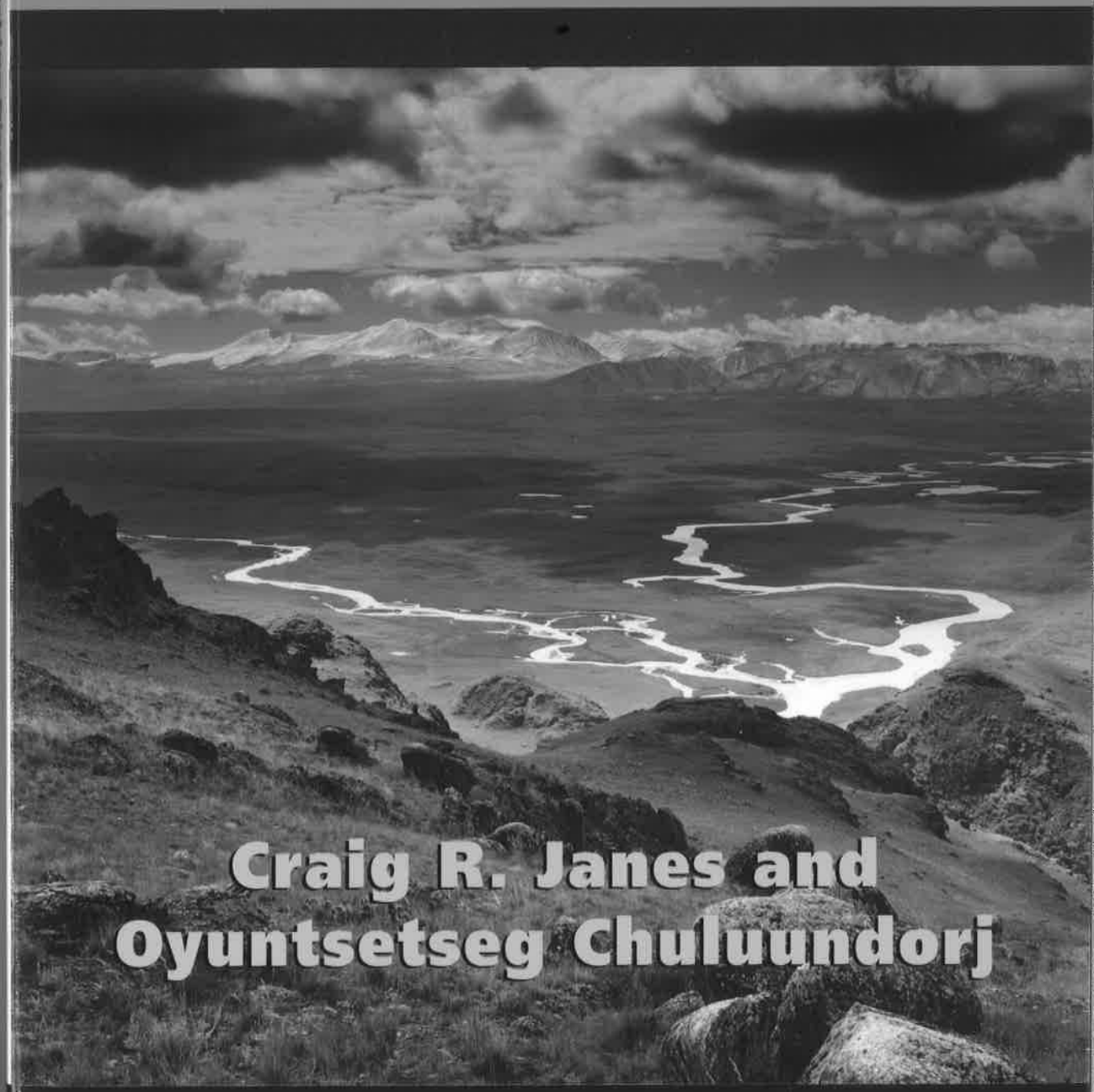
MAKING DISASTERS

Climate Change, Neoliberal Governance, and Livelihood Insecurity on the Mongolian Steppe



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Preface

Our experience working on development and public health issues in Mongolia dates to the late 1990s. One of us (Oyuntsetseg Chuluundorj) is Mongolian, grew up in Ulaanbaatar, and was trained in medicine at the Health Sciences University of Mongolia with a specialty in obstetrics and gynecology. She witnessed the peaceful transition from socialism to free-market democracy and all that it entailed, both personally and professionally. Janes first visited Mongolia in early 1996, just a few years after the transition. At that time, at the request of the University of Colorado-Denver (UCD), he traveled to Mongolia to investigate whether it would be possible to set up an international campus of UCD in Ulaanbaatar. Although this initiative did not ultimately prove to be successful, it permitted him the opportunity to travel frequently to Mongolia and to meet senior officials in the Mongolian Academy of Science and in the Ministry of Education. Out of these meetings the university developed a program to bring promising young Mongolian students and professionals to pursue master's level graduate degrees at the University of Colorado. Four young physicians selected to participate in this program came to work with him in the Department of Anthropology. Some of them participated in the interdisciplinary PhD program in the Department of Health and Behavioral Sciences at UCD, where they specialized in medical anthropology and the social dimensions of international public health. One of these was Oyuntsetseg Chuluundorj. The other three were

Khulan Janchiv, Delgermaa Tsgaankhuu, and Tsogtbaatar Byambaa. All shared an interest in the processes of the transition and its impact on the health system, and a passion to return to benefit their country as it tried to right itself after the chaos of the transition. We developed a number of research projects together that focused primarily on those changes to Mongolian society that affected maternal and child health, processes of aging, access to health care, and evaluation of health reform. Together we began to develop and pursue a number of research interests in Mongolia, especially concerning transformations to the rural economy, the social and health impacts of climate change, the causes of maternal mortality, and the evaluation of market-based models of health reform. This book in large part grew out of these collaborations.

In 2001–2002 Janes was awarded a fellowship to participate in a new Fulbright initiative, termed the "New Century Scholars Program." This program brought together thirty scholars from eighteen countries to focus on, and conduct individual research around, the theme of "Challenges of Health in a Borderless World."[1] Janes' work involved a systematic evaluation of market-based models of health reform in Mongolia, focusing specifically on access to health care by the poorest and most vulnerable (Janes 2004; Janes 2009; Janes et al. 2005). This work, led by the two of us, took us into the squatter settlements, called "ger districts" after the preponderance of gers (yurts) that skirt the central districts of Ulaanbaatar. It also provided us the opportunity to travel into rural areas in central and western Mongolia where we met and talked with many herders reeling from the effects of several recent, consecutive winter disasters in which millions of animals died. These disasters, given the general gloss of "dzud" (pronounced "zood") by Mongolians, have plagued rural herders since the transition, with several occurring between 1999 and 2010.

Although our focus at the time was on health equity and access to health care resources in a context of neoliberal health reform, it became clear during the rural portions of our fieldwork that the rural population was struggling to contend with what seemed to us at the time to be a lack of attention to rural institutions needed to support rural livelihoods. It appeared to us then, as it does with greater certainty and clarity now, that the dzud, while typically associated with impacts on rural herders, exposes deep fractures and contradictions in Mongolian society as a whole that, in good years, remain to a considerable extent hidden. Dzud disasters, we felt, threw into especially sharp relief the errors made by the advocates—both those within Mongolia and representatives of the major international financial institutions—of unfettered market liberalization. Conflating freedom and democracy with an extreme form of market fundamentalism, the success of these advocates in transforming Mongolia has, as we argue here, created a highly unequal, unfortunately corrupt, and increasingly vulnerable society. One important dimension of this vulnerability has been the virtual state abandonment of rural herding communities. Faced with both old and new risks in terms of environmental change, and motivated by a need to secure

sustainable livelihoods in a market context, herders do what they can. Often it is not enough: the dzud; efforts to respond to it; and its economic, social, and health consequences reveal in stark outline the consequences of state retreat.

This situation was something that we believed required further research. So we undertook a study to examine the impact of climate hazards on rural herders. With dissertation funding to Oyuntsetseg from the National Science Foundation (NSF) in 2005, and with additional NSF funding to Janes and Oyuntsetseg through the program in cultural anthropology in 2005–2007, we undertook a major study of pastoralists' adaptation to climate hazards.[2] Our goals in this study were to identify, if possible, the principal risks faced by Mongolian herders in the postsocialist, transitional context; to discover the strategies used by communities and households to manage this risk; and to determine whether these strategies buffer or mitigate environmental risk sufficiently to maintain household well-being, including health, across the rural herding population.

Rather than focus on a specific community—the more traditional orientation for anthropologists—our research goals required us to expand our questioning spatially and temporally. We examined, for example, regional climate change during the approximately ten years prior to our study; social, demographic, economic, and health data aggregated at the level of the "county" (soum); household economics; and the social and health characteristics of individuals. This research took us across much of Mongolia, especially the western and southern parts of the country, and to areas that were variably affected by climate disasters: some greatly, some hardly at all. We met wealthy herding households with holdings of more than one thousand animals, as well as ones not so fortunate, positioned precariously on the margins of the rural economy, one small disaster away from tipping into chronic, irremediable poverty. What we also found is that although their stories diverged, typically dating to the time of the transition and decollectivization, they all shared a common struggle with the significant challenges caused by the retreat of the state from the rural economy. This book tells the story of this struggle and its consequences, not only for rural herders, but for the country as a whole. The juxtaposition of neoliberal economics, and the ideologies that sustain it, with climate change and attendant hazards and risks is an infamously perfect storm that has, and will continue to have without serious attention to rural development, disastrous consequences for Mongolia.

one
Introduction

> When we were at school we were taught the history of Marxism.... That it was a system based on economic principles. But it wasn't, at least not here. You have seen the towns. In every one a theatre, a school, a clinic. This was not economics, it was idealism.... In this new world of the market there is no room for such idealism.... Now we have economics. If we have doctors it is only because we can pay for them. Not because they are right or necessary. This is what is difficult to accept...the end of idealism. It feels like a kind of barbarism.
>
> —*A Mongolian's reflection on postsocialist reforms (cited in Stewart,* In the Empire of Genghis Khan)

The winter of 2009–2010 was a difficult one for much of Mongolia's rural population. After a summer drought that reduced available forage and hay production in several parts of the country, the winter proved to be especially severe. Heavy snow and periods of extreme cold in early 2010 had a serious impact on more than three-quarters of Mongolia's land area. Because of the preceding summer's drought, livestock entered the winter months nutritionally stressed and underweight. Herders were unable to harvest and store sufficient stocks of hay. Because of the winter's heavy blanket of snow and ice, animals were unable to browse. Cold and starvation took their toll. Estimates from the government of Mongolia and the World Bank indicate that at least 8.5 million animals (horses, cattle, camels, goats, and sheep), comprising about 20 percent of the national herd, perished from cold and starvation (Fernandez-Gimenez et al. 2012; Government of Mongolia 2010). Twenty-eight percent of the total human population of Mongolia was affected, 44,000 herding

households lost all of their livestock, and another 164,000 lost more than one-half of their herd (Fernandez-Gimenez et al. 2012). Because of the stress of the severe winter and spring conditions on those animals that did survive, reproductive success the following spring was reduced, slowing a quick recovery of decimated herds. Far from being an isolated rural event affecting a few thousand unfortunate herders, a disaster of this magnitude is a serious shock to the nation's economy. A large proportion of Mongolia's population depends either directly or indirectly on livestock herding for their livelihood, and the production of animal products (hides, wool, cashmere, meat, and dairy) is a mainstay of Mongolia's domestic and international trade. Herding provides for a third of all employment and is arguably the most sustainable sector of the economy (UNDP 2007). Contributions of herding to the national economy in terms of gross domestic product (GDP) declined to 17 percent in 2010, largely stalling what had been rapid economic growth during the past several years and erasing gains made in the booming mining sector. Gross national income (GNI), which is a measure of economic activity by a state's citizens (excluding activity by foreign-owned enterprises), declined between 2009 and 2010 and in 2010 stood at just over US$1,000 (in 2005 constant prices) (Government of Mongolia 2010).

Although extreme winter events, termed *dzud* (Mongolian: зуд), have always been a risk to herding on the Central Asian steppe, the frequency and severity of these disasters in terms of livestock loss and related impacts on livelihoods have increased since Mongolia's transition from a socialist, Soviet satellite state to a free-market economy, a transition that began in 1990. Between 1999 and 2002, Mongolia experienced three major winter disasters, each resulting in substantial losses to the national herd (Chuluundorj 2006). With the dzud of 2010, the worst experienced since the winter of 1944–1945, four major winter disasters have struck Mongolia in just a twelve-year period.

The dzud has impacts that reach into nearly every sector of Mongolian society, where rural and urban social systems and economies are closely linked (Fernandez-Gimenez 1999a; Humphrey and Sneath 1999). Since the late 1990s, the most severely affected rural herders have been pushed out of the rural economy, migrating to Ulaanbaatar and other towns and cities in large numbers, setting up their yurts (*ger*) on the outskirts of town and joining thousands of others in similar straits, competing for livelihoods primarily in the informal sector, living in expanding squatter settlements, and comprising a growing class of insecure, marginal, and vulnerable poor (Janes 2010; Janzen 2005). In part because of these climate-driven failures in the rural economy, and in part a result of the dismantling of supports after 1990, the poverty rate has remained stubbornly fixed at more than 30 percent for the past two decades (UNDP 2007) despite considerable international investment and high levels of foreign development assistance.[1] Poverty and poor living and housing conditions have led in turn to a number of social and health problems. Ulaanbaatar now has some of the worst winter air pollution in the world, caused primarily by the burning of low-grade coal and wood in inefficient stoves in the poor "ger districts" that

surround the city center (Allen et al. 2013). In addition, chronic poverty, coupled with limited access to quality health care, contributes to a number of significant health problems (Janes 2009; Janes et al. 2005). Rates of crime and violence have shown precipitous increases since the 1990s (Nixson and Walters 2006; Rossabi 2005), and growing numbers of unemployed and underemployed in peri-urban Ulaanbaatar may contribute to political instability and violence, such as was witnessed in the election riots of July 2008 (Delaplace et al. 2008).

Understandably, then, winter disasters are a major environmental and policy issue in Mongolia. The dzud is not just an unfortunate event that affects a few thousand isolated rural herders; it is arguably the most important driver of chronic poverty in the country as a whole. But the reasons offered for why the dzud, which is, after all, a well-known and understood climate hazard, and one with which Mongolian herders have had to cope for centuries, should now produce such extreme levels of suffering are complex and to some degree contested by experts and policy-makers. Questions surrounding cause and effective intervention remain to a considerable extent unanswered. These are the questions that this book seeks to address. We do not only focus on the properties of the dzud; we also present and analyze a broad range of phenomena that are linked, fundamentally, to its adverse social and economic consequences. These include urbanization and urban poverty; access to essential health care and education; changes to gender roles, especially for women; rural economic development and resource extraction; and public health more generally.

Also at issue are processes of globalization, here encompassing both material and ideological processes that have transformed Mongolia's political economy. So, while this book begins with a focus on rural Mongolia, like many herders these days we will be drawn inevitably to the city. We will see that there are deep social and economic links between urban and rural society, including, most importantly, common underlying institutional and economic drivers of poverty and social and economic vulnerability. It is our argument here that analysis of the disasters encompassed by the term "dzud" provides a critical lens through which one can ascertain the contradictions and conflicts that have compromised Mongolia's efforts at social and economic development since 1990.

To appreciate the links between these phenomena, we present research undertaken during the past decade in both urban and rural regions of the country. This research has engaged the main themes and theoretical perspectives of several areas of scholarship, ranging from research on the social consequences of climate change and related hazards, to the economics of "development," the anthropology of pastoralism, and, finally, the determinants of sustainable livelihoods, including food and health security as well as the environmental context. In the chapter that follows we develop the conceptual framework that brings together these somewhat disparate disciplines and charts the analytical path of our argument. Here we provide a brief background on Mongolian society, its severe and changing climate, and the research projects on which this book is based.

Mongolia: History and Geography

Mongolia is a landlocked country, bordered by two high-population world powers: the Russian Federation to the north and the People's Republic of China to the south (figure 1.1). Although one of the larger countries in Asia in terms of land area (1.56 million square kilometers), it has a small population (about 2.74 million in 2010). The population density of 1.75 persons per square kilometer makes it one of the most sparsely populated countries in the world. About 95 percent of the population is composed of Mongolian-language speakers; the majority of these (82 percent) are from the Khalkh ethnic group. Ethnic Kazakhs are the largest non-Mongolian group, comprising about 4 percent of the population. Nearly two-thirds of the population is now considered "urban," residing in provincial capitals and cities. Ulaanbaatar, the capital, had a population in 2010 of 1.15 million people, or 42 percent of the county's total (Government of Mongolia 2010).

The greater part of the country is steppe grasslands. Of the 1.56 million square kilometers of total land area, only about 140,000 square kilometers are forested or in forest regeneration reserves. Most of the forested areas are found in the western and northern regions of Mongolia, especially along the northwestern border with Russia. The central and eastern parts of the country are vast steppe grasslands. The scrub and rock Gobi Desert comprises the southern one-third of the country. The Mongolian steppes are the largest remaining natural grasslands in the world, and continue to support several hundred thousand livestock herders, as well as those whose livelihoods depend on the processing and sale of animal products, including cashmere, wool, hides, meat, and dairy. The herders and their experiences during the past century or so are the principal subject of this book.

Mongolia is characterized by a harsh continental climate with extreme temperature variation. Temperatures can drop to as low as -40 degrees Celsius in winter and typically reach 35 degrees Celsius in summer. The average altitude is about 1,500 meters above sea level, with the highest elevations in the northwest. Precipitation is sparse, averaging just over 200 millimeters (less than 8 inches) per year. It is also highly unpredictable, varying widely from year to year, exhibiting greater than 30 percent interannual variation over most regions of the country. Much of Mongolia is characterized by a range ecosystem "in disequilibrium" (Behnke et al. 1993; Humphrey and Sneath 1999), meaning that resources (mainly water and pasture) occur in "patches" that vary considerably across space and time. To cope with this variability, Mongolian pastoralists have developed a complex suite of subsistence strategies that have permitted them to live sustainably in this variable environment for millennia.

Mobile pastoralists have inhabited the steppes of Central Asia, including Mongolia, for thousands of years.[2] By the 12th century the area was a mix of different tribes and "Khanates," each vying for control over productive pastures and dominance of trade routes. Chinggis Khan (popularly, "Genghis Khan") united many of these in the 13th century, establishing an empire that stretched from Hungary in the west to the Korean peninsula in the east. The Mongol Empire extended across much

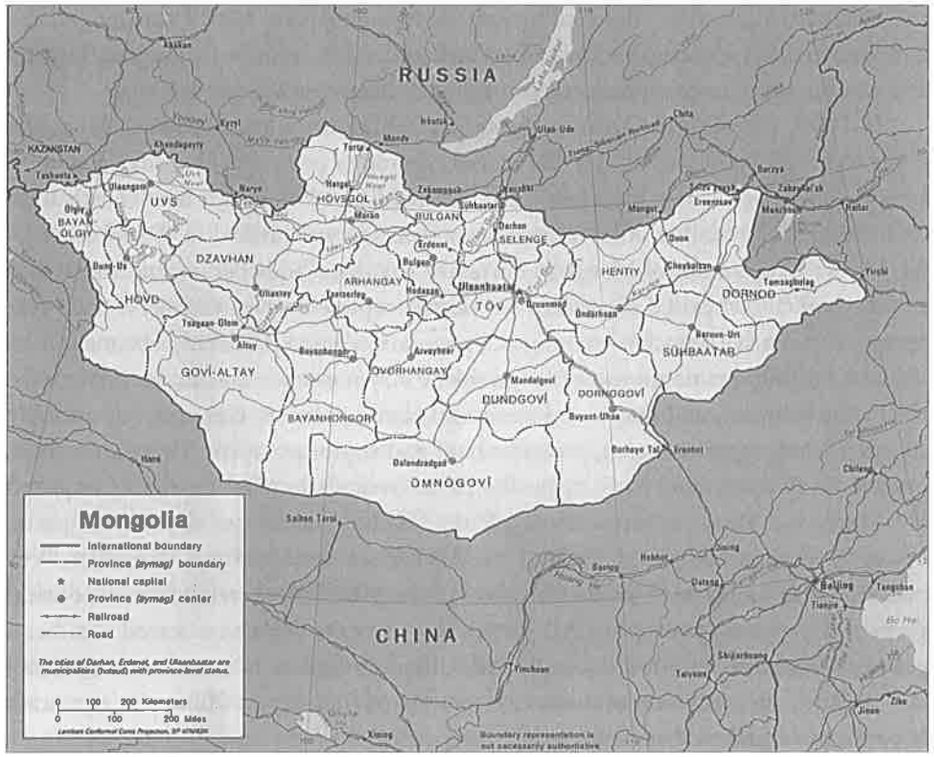

Figure 1.1. Map of Mongolia. Courtesy of University of Texas Libraries, http://www.lib.utexas.edu/maps/mongolia.html.

of China, where the grandson of Genghis Khan, Kublai Khan, established the Yuan dynasty in 1271. By the 14th century, however, the Mongol Empire was in decline, and a resurgent China ended the Yuan dynasty in 1368. In the late 17th century Mongolia came under the control of the Manchus (Qing dynasty) and was incorporated into Imperial China. With the fall of the Qing dynasty, competition between China and Russia over control over the Mongolian steppes led to the division of Mongolians between what is now southern or Inner Mongolia, today an autonomous region of China, and the State of Mongolia, which has been independent since 1921. The two areas have followed different trajectories in terms of social history and economic development since the 20th century.

In 1924 Mongolian communists asserted control over the newly formed Mongolian state, establishing single-party rule by the Mongolian People's Revolutionary Party (MPRP), which embraced Marxist-Leninist economic and political philosophy. Mongolia was the Soviet Union's first satellite state and was until 1990 the world's second oldest communist country. Mongolia's economic and social policies were formed largely in collaboration with the political leadership in Moscow. Efforts were made to organize herders into state farms and collectives. These efforts, though delayed by the Second World War and early resistance by herders, were largely completed by

the 1960s. As part of its efforts to modernize Mongolia, the MPRP encouraged the development of industrialization in new urban centers, mainly focused on mining and processing of animal products, primarily cashmere, wool, and leather.

In 1990, and with the acquiescence of the ruling revolutionary party, Mongolia made a peaceful and remarkably fast transition from a one-party-dominated state to a multiparty democracy. Elections were first held in 1990, and a new constitution enshrining the principles of representative democracy was ratified in 1992 (see chapter 3). The government of Mongolia currently has three branches: a unicameral legislative branch comprised of seventy-six elected representatives who serve four-year terms; an executive branch consisting of a popularly elected president, a prime minister, and a deputy prime minister (the president may nominate and shares power with the prime minister, and may veto legislation); and a judiciary composed of multiple courts, including, at the apex, constitutional and supreme courts. Two parties have until recently dominated parliament: the Democratic Party (a center-right party) and the Mongolian People's Revolutionary Party (MPRP, the former communist party, currently a center-left party). In 2012 the MPRP was renamed the Mongolian People's Party, although some former members of the MPRP have created a new political party and kept the older name. All parties have to some degree embraced neoliberal political-economic reforms, although with different degrees of enthusiasm (Rossabi 2005). With the exception of some election-related violence in 2008, the transition between governments has been peaceful since 1990.

As we describe in greater detail in chapter 3, the transition from a centrally planned socialist to a capitalist market economy was difficult for most Mongolians, resulting in widespread insecurity. The GDP did not return to pretransition levels until 2004, and unemployment and poverty have persisted at high levels during the last decade, despite gains in mining revenues, agriculture (herding), domestic trade, manufacturing, and transportation. About one-third of the population is currently living below the poverty line, a rate that increased during the two decades after the transition (Rossabi 2005). In 2010 the national poverty rate was 39 percent, up from the rate of 36 percent in 2002–2003 as measured by the Living Standards Measurement Survey conducted by the World Bank (poverty here refers to those unable to purchase a basic food and nonfood bundle of necessities, about $2.50 in current USD per person per day). As will be discussed in later chapters, in a wider context of economic growth these figures are the consequence of two linked processes: rapidly increasing social inequality and continuing state disinvestment in social welfare, health, and education.

Notes on the Administrative Organization of Rural Mongolia

Mongolia is currently divided into twenty-one *aimags* (provinces) and the special administrative zone of Ulaanbaatar. Outside of Ulaanbaatar, aimags are subdivided into *soums*, sometimes referred to by the English term "district" or "county,"

and soums are further divided into *baghs* (subdistricts). Ulaanbaatar is divided into *duuregs* (municipal districts) and *khoroos* (subdistricts, sometimes called microdistricts). Districts and subdistricts of Ulaanbaatar, aimags, and soums each have their own elected assemblies and appointed governors.

The main units of analysis to which we refer in this book are the soum and the bagh, which are the principal units of administration and government in rural regions. Nearly all rural soums in Mongolia are remnants of the old socialist collective system, or what Mongolians term the *negdel*, and many negdels grew out of even older administrative units established during the Qing period (see chapter 3). During the socialist period the soum centers were built up as the major unit of rural governance. Soum centers were composed of administrative buildings, clinics, schools, museums, libraries, and halls for meetings, assembly, and entertainment. It was here that the main decisions were made regarding the management of the pastoral production in light of the livestock production quotas set centrally (chapter 3 presents a description of negdel herding practices). It is important to note that until 1992, throughout rural Mongolia the state exercised a forceful presence down to the household level through the administration of the rural collectives.

These days the negdels are gone and whatever property was managed collectively has long since been divided up and given away to previous negdel members. Today the soum remains the primary level of rural government in Mongolia, composed of a governor and a small administrative staff. Below the soum during the collective era was a regional unit that today is referred to as the bagh. While baghs remain important signifiers of place and territory, they are no longer units of cooperative production. The soum administration appoints bagh governors, who are well-recognized and typically affluent herders who provide leadership to herding households in the bagh. The bagh governors will convene meetings to discuss herding issues, sometimes adjudicate conflicts, and collect and report household-level administrative data to central government offices. But baghs, which at one time were places with permanent buildings (e.g., milking collectives, meeting places, and perhaps a small clinic), are now mainly just named regions or places, the buildings of the old bagh centers having fallen into disrepair or been dismantled by herders needing building materials for their winter and spring shelters. Some, as in the photo shown in figure 1.2, have been converted by herders to seasonal storage facilities. One important remainder of the old bagh system is the health care provider—the community health worker (*feldsher*)—who provides basic health services to bagh households (see chapter 6).

The soum centers, although retaining some of their local administrative importance, also appear in many places to be partially decrepit and disintegrating, especially away from main roads and mining activities. What were clearly once gardens and parks defining the public spaces linking government, health, and educational buildings have long since become dusty tracts marked by concrete rubble and old and twisted metal fences. At the time that we were doing our research, many of the school dormitories were barely habitable: there was not enough money for heating

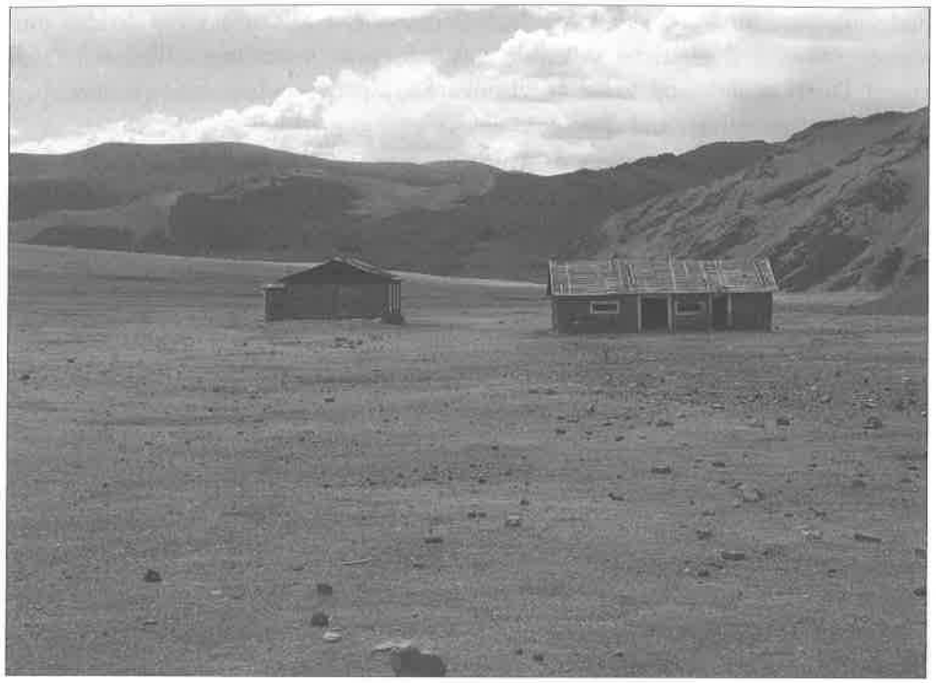

Figure 1.2. Remnants of a bhag center, Erdenetsogt soum. Photograph by Craig R. Janes.

fuel, food, or, for that matter, teachers. In 2000, for example, 80 percent of dormitories were in need of repair. Since that time, and with foreign aid, there have been some improvements. Still, many school-age children live with relatives who move seasonally, in a new pattern of mobility, to soum centers where they look after their, and their relatives', school-age children (Steiner-Khamsi and Gerelmaa 2008; also see chapter 5). Electricity can be sporadic, and, especially in the Gobi, access by soum residents to potable water is often a problem. Public facilities—museums, entertainment halls, public showers—may no longer be open or working, replaced these days by a few shops, a small restaurant or two, and the most prominent symbol of the new capitalist Mongolia: a local branch of the Khan Bank, the first, and at the time of our work the only, major national bank providing credit to herders (see chapter 4).[3] But altogether soums are dusty places where the retreat of the state post-1990 is palpable, both in the crumbling edifices of public buildings and in the light-handed, if not absent, exercise of government authority over the pastoral commons.

A Post-Transition Social History

Ulaanbaatar, 1996–2013

Ulaanbaatar in 1996 was just beginning to show a few halting signs of recovery from the economic dislocations of the early 1990s. Trade with China had supplanted

Figure 1.3. Khyrgas soum center. Photograph by Craig R. Janes.

trade with Russia, and there was food in the shops, although with inflation and unemployment it was still a struggle for many to afford any but the basic mutton, flour, rice, and tea that are the mainstays of the Mongolian diet. Long walks along the streets of the capital were pleasant. There was little traffic—few people had cars, and fuel was expensive and in short supply—and the city's residents were on foot or crowded into buses and trams that plied the main thoroughfares of the city. A few small shops and restaurants had opened, and along the streets were dozens of kiosks selling single cigarettes, chewing gum, and drinks. The vodka was cheap and readily available, contributing no doubt to widespread public drunkenness. Ulaanbaatar at the time was a monument to high modernist Soviet architecture, evidenced by the blocks of utilitarian apartment buildings; the massive energy plants belching coal smoke and generating power, heat, and hot water for the entire city; and the monumental edifices in the center of the city. Especially magnificent was the sprawling Sukhbaatar Square in front of the government buildings where just a few years before, demonstrators and hunger strikers had initiated the massive political and economic transformation of Mongolian society (Rossabi 2005).

But the physical and spatial character of the capital had not yet changed much from the late 1980s. A huge statue in the middle of the central square featured Sukhbaatar, the hero of the 1921 socialist revolution, astride his charging stallion, appearing to urge Mongolians to throw off the chains of religious and feudal slavery

and stride toward a glorious socialist future. Although that future may have never fully come to pass, Sukhbaatar remains symbolic of what is perhaps most important to Mongolians: their independence. A small country of a few million people, sandwiched between two massive and powerful states, the ability to sustain their independence and freedom, especially from Chinese hegemony, is a constant worry and continues to fuel much political discourse and public policy.

Just off the main square, and in 1996 joined to it by a pleasant garden of pine trees and flowering shrubs, is the Ulaanbaatar Hotel. Formerly the grand lodging and entertainment setting for Revolutionary Party elites, the hotel was in 1996 the place to stay for the international development set: global businessmen poking about for investment opportunities in the newly liberalized economy; a few visitors and tourists; and the occasional scholar, attracted by Mongolia's recent openness to the West and intrigued by the scope and social impacts of its recent political transformation. In front of the Ulaanbaatar Hotel, in that pleasant park, was a prominent statue of Vladimir Lenin. The statue remained there until 2013, when victory in the local city elections by the center-right Mongolian Democratic Party finally expunged this last symbol of the socialist past.

Although the park in front of the hotel is now reasonably well maintained, many people—foreign researchers and Mongolians alike—have been disturbed by the disintegrating quality of public spaces. During the socialist period Mongolians had made a great effort to develop public gardens in and around public buildings and in aimag and soum centers. In the center of apartment blocks were gazebos, benches, playground equipment, and other amenities to facilitate leisure, relaxation, and neighborliness. The apartments themselves had building keepers who made sure that the lights worked, disposed of trash, swept and mopped hallways and staircases, and kept a close watch on suspicious strangers. By the mid-1990s it was clear that maintenance of public commons was one of the first casualties of the capitalist revolution. Except for a few in the center of Ulaanbaatar, most of the neighborhood parks began to wither and die as a result of neglect. The public spaces in the center of apartment blocks had become depressing places of bare earth, trash, and jumbles of crumbling asphalt and concrete. Entering an apartment building was always a challenge. The stairways were dark, cold, and foreboding, the light fixtures and radiators having been stolen for sale on the black market years before. The hallways reeked of undisposed garbage, urine, and feces. As we look back on this time, it is clear that the decay of these public commons—amenities enabling sociality and fulfillment of the social contract—was a harbinger of what was happening, and what was to happen, throughout the country. The arrangements that made social life possible, that brought some sense of shared experience and collective identity, were under assault. Democracy, perhaps because of its conflation with privatization and free markets, seemed to many Mongolians we spoke to at the time to drive individual self-interest at the expense of what had once been a tightly knit social fabric rooted in family, kinship networks, and place.

We did not know it in early 1996, but Mongolia was on the verge of an even more aggressive shift to market fundamentalism. Beleaguered by inflation, continuing unemployment, unremitting poverty and suffering, and rumors of high-level corruption, the Mongolian People's Revolutionary Party, which had steered government from the beginning of the economic transition, was about to lose its majority to the free-market advocates of the Democratic Coalition. From 1996 to 2000, at the national level, Mongolia was held in the sway of these harsh advocates of unfettered economic liberalization, who, with the strong backing (some would argue strong-armed interference) of international financial institutions, right-wing foreign political action groups, and international nongovernmental organizations (NGOs), provided the final blow to Mongolia's well-organized and accessible educational, social, and public health systems. While these systems had been under assault from the very beginning of the transition, the MPRP had tried, although ineffectually, to stem the worst elements of what was then called "shock therapy" by the Western architects of postsocialist reform. The rural people whom we will introduce in the next sections were finally, and wholly, cut adrift from state support, and for the very first time asked to make a go of it as capitalist peasants, relying on household-level subsistence production with marginal access to the as yet undeveloped markets they needed to sell their goods and earn cash for commodities, education, and health care.

Fast-forward to 2014 and one can easily see the changes wrought by two decades of rapid economic development coupled with social disinvestment, corruption, and state decline. Ulaanbaatar has grown rapidly, doubling its population in twenty years. This growth is due to a number of factors, most important the declining quality of services, especially health and education, in the countryside; changes to rural society that have compromised the livelihood security of rural herders in the face of climate change; and the increasing concentration of wealth and employment opportunities in the capital. Ulaanbaatar exerts a powerful pull at the same time the rural hinterlands slough off those unable to make it in a newly and vastly more risky and unpredictable environment.

The most noticeable changes in Ulaanbaatar since 1996 are crowding and horrible traffic. Rampant and unplanned building has eroded any hope for redeveloping public spaces and amenities. High-rise apartments are chock-a-block with new hotels and office buildings. More and more people are able to afford automobiles. With virtually no urban planning and limited investment in the urban infrastructure, transportation corridors are in gridlock during rush hours, which now extend throughout the day. At most times it is much faster to walk anywhere in the center of the city than it is to go by car, although with the traffic and frustrated drivers who flaunt traffic lights and lane markings, crossing streets is not for the faint of heart. The city has spread out considerably, both along its east-west axis, which was how it originally grew, and from north to south. Sprawling growth of ger communities—squatter settlements originally dominated by the Mongolian felt tent, or yurt—is especially noticeable to the north and northeast of the city center. To the south along

the Tuul River, which defines the Ulaanbaatar's valley setting, the new Mongolian and international elites, with considerable foreign investment, are building luxury apartments.

It is to the ger communities that many rural migrants originally move, erecting their ger in a relative's compound, providing rent to an owner, or in some cases simply finding unoccupied land on which to reside. This land can even include summer flood zones or cemeteries. When and where possible, residents seek to improve their living space by erecting wooden fences around their ger, digging latrines, and, over time, erecting small houses and outbuildings better able to withstand the winter cold. With changes to the Land Law (we describe this in chapter 4), some residents are able to establish land ownership. As the settlements age, many ger are replaced with small houses, so that as one moves farther out from the city center, one can see a shift in the solidity and improvement of land, from fenced compounds with houses and outbuildings to those with ger and little else. Most of the residences have access to electricity, although very few have access to water, improved sanitation, or centrally generated heat. Potable water is trucked to ger communities on a regular schedule, where residents purchase it. A common sight is a child pushing a water barrel on a wheeled cart to the local water distribution center. With few residences connected to city sewerage systems, people rely on digging latrines and erecting outhouses. In order to receive social and health services, migrants to Ulaanbaatar must establish residency by registering officially with the local district administrative offices. Registration is expensive, however, and those with few means often cannot afford it.

Like squatter settlements throughout the world, the ger areas are crowded and occasionally dangerous. Living quarters are small and the environment is polluted. Small paths and roads traverse the area. Fences made of wood and scrap metal define residence compounds, protecting them from view and public access. Drainage areas, especially dangerous during the summer rainy months when flash floods can be fatal, cut through the districts. In dry months these serve both as roads and as garbage dumps. Scattered along larger roadways are small kiosks and stores selling a variety of sundries and foodstuffs. In the winter most residents of the ger areas burn either coal or wood in low-efficiency stoves, contributing to Ulaanbaatar's serious air pollution problem. The coal ash from ger stoves is dumped by households into the streets, further exacerbating pollution problems. With several colleagues we conducted air quality monitoring in and around the ger areas in the winter of 2010. We found that the annual average concentration of small airborne particles ($PM_{2.5}$), mainly from wood and coal combustion, was more than seven times the World Health Organization (WHO) air quality standard. Using conservative methods we estimated that 29 percent of cardiopulmonary deaths and 40 percent of lung cancer deaths are attributable to these high levels of air pollution (Allen et al. 2013). It seems clear that the growth of the ger areas around Ulaanbaatar is an unexpected and particularly disastrous consequence of the policies followed since the transition.

Our first funded research work in Mongolia was conducted in these ger

communities, focusing specifically on access by residents to health care. With the loss of Soviet subsidies to the Mongolian government, the old Russian-style "Semashko" health system, based largely on institutional care in hospitals and polyclinics, collapsed. In its place Mongolia was struggling to build a comprehensive and fully accessible system of primary health care (see chapter 7). By 2000, with funding primarily from the Asian Development Bank, Mongolia had established family clinics throughout Ulaanbaatar and a few of the aimag centers. Consistent with internationally sponsored efforts to reduce state investment in social services, the family doctors were considered private providers (NGOs), working under contract to provide primary health care to specific catchment areas (subdistricts, or khoroos) throughout the city. Clinic facilities were funded by loans. Our concern at the time was whether these newly established clinics were able to provide a full range of services, especially to the poorest and most vulnerable households. We spent many hundreds of hours talking with residents in these ger districts, not only about their experiences with the new health care system, but also about where they were from, their experiences in Ulaanbaatar, their livelihoods, and the challenges that they faced. We also spoke with the doctors struggling to provide services in these communities. In all we visited seventy-three households in the ger districts.[4] The heads of forty-six of these households had migrated to Ulaanbaatar from elsewhere. Many had been herders, or had been employed by the old collectives (negdels) of rural Mongolia. They came to Ulaanbaatar for complex reasons: loss of rural livelihoods, a desire to find employment or to provide access to better education for their children, or, with retirement, to establish a residence that would accommodate their relatives' children, sent to the city to take advantage of better educational opportunities. But life in Ulaanbaatar, they found, was nearly always more difficult and insecure for them than they had anticipated. Nearly one-third reported food insecurity, about one-half fell below the poverty line, one-third lived in unimproved ger compounds, and two-thirds were either unemployed, worked in the informal sector, or relied on pensions for survival. The mean income per person was less than US$1 per day in 2001 (Janes et al. 2005).

Maintaining a secure livelihood in the ger districts was (and continues to be) a challenge. People were either living on fixed incomes from pensions or had to rely on unpredictable incomes from buying and selling in the informal sector. Some collected and sold recyclables, others bought and sold clothing or other cheap consumer goods on Mongolia's "black market." Some engaged in petty capitalist trade with China, traveling across the border by rail to purchase commodities to bring back for sale in Ulaanbaatar. Those with the good fortune to obtain formal employment typically worked in construction or the poorly paid service sectors of the economy, many as cooks, security guards, or janitors. A few were lucky enough either with their entrepreneurial activities or secure formal employment to move out of poverty.

As one might expect, these economic stresses manifested themselves in social and health problems. The crime rate in Ulaanbaatar increased precipitously in the 1990s, more than doubling from 1990 to 2000, although the rates have declined

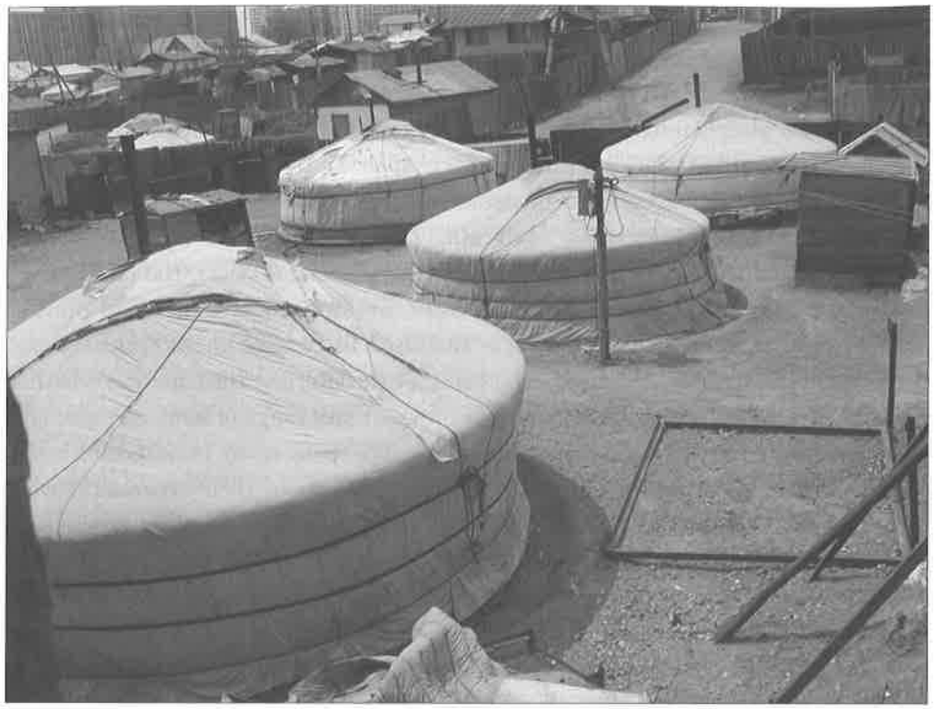

Figure 1.4. Ger district compound, Ulaanbaatar. Photograph by Craig R. Janes.

slightly since then (Rossabi 2005).[5] Especially troubling were marked increases during the first decade of the transition in rates of violent crime, including attempted murder and manslaughter. Violent crime has continued to increase compared to other offenses; in 2010 the proportion was at 34 percent of all reported offenses.[6] Much of this crime is associated with alcohol use, long recognized as a problem in Mongolia. Rossabi (2005:147) reported that one survey done in the 1990s suggested that more than half of all Mongolian men were "heavy drinkers." While later studies have not confirmed this alarmingly high rate (WHO 2007),[7] heavy and problem drinking remains a serious concern and likely contributes to violent assaults and especially to high rates of gender-based violence. In a survey of Ulaanbaatar women conducted in 2004, Oyunbileg and colleagues found that women were much more likely to have experienced physical violence perpetrated by partners who use alcohol. Unsurprisingly, poverty, residential insecurity (living in a ger or rented apartment), and living with an unemployed partner increased the risk for domestic violence (Oyunbileg et al. 2009).

The ger areas, with their pollution, concentrated poverty, unemployment, and livelihood insecurity, are unhealthy places to live. The question we asked ourselves at the time was how what we saw in Ulaanbaatar was similar to or different from the situation in rural areas. We then spent many weeks in Khovsgol aimag in

north-central Mongolia, interviewing doctors and residents in the provincial capital of Mörön and in four soum centers in the southern part of the aimag. It was there where we first became aware of the escalating vulnerabilities of rural residents and the close and direct relationship of rural people and events to the insalubrious conditions found in the ger communities of Ulaanbaatar.

The Countryside, 2001–2013

One leaves Ulaanbaatar by heading either east or west out of the city. In both directions the city sprawls for miles, and with today's traffic the trip can seem to take forever. The built-up city center gives away eventually to rings of apartment buildings, a few ger areas, factories, the remnants of old Soviet military installations, and industrial development, some derelict, others newly going. Finally, on either end of the valley where the railway that defines the east-west axis turns either south toward the Gobi Desert and China or north toward Irkutsk and Russia, the city yields to the great steppes of Central Asia. But Ulaanbaatar exerts a social and economic pull that is hard to escape. Within 50 to 100 kilometers along the main road corridors are clustered numbers of towns and settlements. Some arose as market centers, such as a major wool market to the west of the city. Others are developments of summer houses that are the Mongolian equivalent of Russian "dachas," which have become popular among the Mongolian elite and middle classes, providing an escape from the heat, pollution, and stresses of city life for a few months each summer. Some are county centers, once the headquarters of state farms or collectives, which have grown in population as herders move closer to Ulaanbaatar to take advantage of better marketing opportunities for their animal products as well as to be closer to the better health and educational resources available in the capital. The towns, and the pastures, are more crowded and under greater stress the closer one comes to the center. As one moves away, population density declines markedly, and one begins to see herd animals in larger numbers, small clusters of gers, and astonishingly vast landscapes seemingly devoid of human presence.

The roads worsen significantly once out of the city, and still today many are unimproved dirt tracks, especially once one leaves the few main transport and trucking routes. Even the improved and paved roads, through poor construction, lack of regular maintenance, and vicious winters, are a mess of ruts and potholes. One of the great dreams of the early reformer Nambaryn Enkhbayar, an MPRP politician who served both as prime minister and president,[8] was to build a great, 2,700-kilometer-long "Millennium Road" from east to west. The idea was to create a development corridor along which towns and settlements would develop as industrial and market centers, linked both by transportation infrastructure and by Internet communication. In this scheme, large numbers of herders would be "settled" into ranchlike cooperatives clustered around newly emergent towns and market centers (Bruun 2006; Rossabi 2005:129–130). Reflective of a serious misunderstanding among the Mongolian elite of the fundamentals of mobile pastoralism, the plan was in essence

to sedentarize the rural population and to create an urban-based economy thought to be more befitting of a modern capitalist state. Although more and more paved roads are now connecting aimag centers, economic pressures have stalled many features of this grand plan. But roads and road building continue to top the development agenda. And although herders are not now subject to state-mandated resettlement, the economic opportunities afforded by roads, as we show in chapter 4, has resulted in some crowding, and resulting overgrazing, along the major roadways.

Although we had numerous opportunities to visit the rural countryside, especially Oyuntsetseg, who like many young Mongolians attended summer camps and traveled to visit relatives while she was growing up, it was not until 2001 that we undertook systematic research outside of Ulaanbaatar. Wanting to examine the implementation of Asian Development Bank–scripted health reform in the countryside, we chose to travel to Mörön, the capital of Huvsgol aimag and one of the first places outside of Ulaanbaatar to implement health reform, and to four rural counties in the southern part of that aimag. We were also hoping to identify factors related to the high rates of maternal mortality Mongolia had experienced up to that point (Janes and Chuluundorj 2004). We spent time talking with doctors, health officials, and residents in each of these places, and in the process came to learn a great deal about the impact of the transition, not only on pastoral livelihoods but on the social, education, and health infrastructure of rural Mongolia. It was here that we began to see the impact of the transition on people's ability to manage complex environmental challenges and its consequential effects on livelihood security and vulnerability. We saw, in short, the beginning of an assemblage of processes that pushed people out of rural areas, placing them at risk for the social suffering we witnessed in the ger communities around Ulaanbaatar. It appeared to us that in leaving herders to essentially fend for themselves—a vastly different social context from what had existed during the collective period, and perhaps even during the feudal period that preceded it—households needed to manage new kinds of uncertainties and contingencies, many with which they had little previous experience. Without the social and institutional supports of the past, livelihoods had become increasingly insecure. A brief description of one family's story will sharpen this observation:

In August 2002 we visited an encampment of two related households (referred to as a "khot ail," the principal cooperative social unit above the household in Mongolia; see chapter 5) in Rashant soum, southern Khovsgol aimag. This encampment was composed of a stem family group: The parents and other senior members of the extended family and their unmarried children occupied one ger, and in the second resided a married daughter, her husband, and their young child. Also resident in the second ger was the four-year-old niece of the married daughter, daughter of the oldest son currently living in the first ger. How this girl came to live in the aunt's ger is the key element of this story.

Both households lost nearly all of their animals in a dzud that occurred in the winter of 2000. Fortunately they were offered an opportunity to participate in a

restocking program established in this area by a European NGO. In this program each of the participating families was given approximately 600,000 *tugriks* worth of animals (worth about US$600 in 2001) every year over three years: large fertile animals (mainly cattle) the first year, and smaller fertile animals (sheep and goats) the following two years. The animals were to be "repaid" in equivalent animal units (in Mongolian, *bod*, or "sheep forage units") in five years' time (in 2005), with the families keeping the natural increase. In good years when animals are maximally fertile, herds can increase rapidly. Programs such as these are relatively low cost and well suited to Mongolian conditions provided that other risks to livelihoods can be effectively managed.

In October 2001 the wife of the oldest son of the family died of leukemia. She had complained of chronic fatigue for some time and finally, in a state of complete exhaustion, she went to the local soum clinic. Soum clinics, typically staffed by a doctor or two, a midwife, and several community health workers (feldshers), comprise rural primary health care in Mongolia (see chapter 7). Soum doctors referred this young woman to the provincial hospital where a blood test showed that her blood cell counts were catastrophically low. Said her mother, "Her blood was like water." The aimag hospital indicated that they could do nothing for her, and doctors suggested that she visit the main tertiary care hospital in Ulaanbaatar that serves the rural population. There she was hospitalized for one and one-half months and given blood transfusions and other treatments to improve her blood counts. She was released after these treatments proved unsuccessful and the family was told that there was nothing else that could be done to save her life. She died at home twenty days later, leaving behind her young daughter, then age three, to be cared for by her sister-in-law. Her husband moved back into his parents' ger. The cost to the family was high: They spent about 400,000 tugriks (about $400) for transportation and treatment costs (mainly for blood transfusions). They borrowed money from a number of relatives and sold what raw cashmere they had as well as half the livestock they were provided in the restocking program. At the time that we interviewed them, they were not certain that they would be able to "repay" the animals given them by the restocking program, nor were they at all confident that they would be able to continue herding given their precarious financial situation. At the time we spoke with them, they were contemplating a move either to the provincial center or to Ulaanbaatar to look for work.

This is an unfortunately common story, both in Mongolia and globally among those living in poverty. We know from multiple studies that one of the triggers of livelihood insecurity and chronic poverty is the expenses associated with catastrophic illness (Narayan et al. 2000). Struggling to save loved ones, people sacrifice whatever assets they can call upon. Even with positive outcomes, loss of critical assets can compromise the economic future of a family. Yet it is important to note here that in the Mongolian case such compromises are newly emergent phenomena. Before the transition the rural collective would have buffered the consequences of the dzud, and

might have prevented a total loss of livestock through provision of emergency fodder and, if necessary, motorized transportation to less affected areas. Some restocking of livestock would have been possible. Health care would have been accessible free of charge, of course, and the replacement of labor needed for caregiving would have been provided. While it is doubtful that the final outcome would have changed—treatment of this kind of leukemia was likely no more successful in Mongolia prior to 1990 than it was in 2001, regardless of ability to pay—the family's future livelihood security would not have been jeopardized. However, without the formal social and institutional supports provided by the collective, the family was forced to rely on their own scant assets to manage this unanticipated event. In the postcollective period, this means relying on one's social networks, or what development economists have come to term "social capital" (Baron 2004; Franklin 2004; Grootaert et al. 2004). Yet even with help from kin and with access to a reasonably well-intentioned and well-designed restocking program, the family was forced to spend down those assets on which their livelihood security depended. These are the most vulnerable of rural herders, one minor disaster away from joining the urban poor in the ger districts of Ulaanbaatar.

Research on Climate Change and the Vulnerability of Rural Herders, 2005–2007

As we considered this case as well as several others like it, we began to ask several questions. First, how had the social and economic organization of herding changed during the past decade since decollectivization? How had reorganization affected the capacity of herders to respond to or cope with biophysical challenges such as dzud or drought? Had exposure to risk changed and were there any newly emergent strategies employed by communities and households to manage this risk? Were these strategies sufficient to maintain household well-being and long-term livelihood security? Underlying these specific questions is a larger and more general concern: does mobile pastoralism have a future in Mongolia, and if so, what can be done to sustain it?

Motivated by these pressing questions, and after completing our study of access to health care in the context of post-transition health reforms, we developed plans for a much larger and more ambitious program of research. In our planning we decided that, rather than focus on a specific community or communities, an approach that is typical of most conventional anthropological ethnography, we would look more broadly across Mongolia. We wanted to be sure that we captured variable experiences across ecological zones, and across areas of Mongolia that are more or less susceptible to climate hazards. With funding from the U.S. National Science Foundation (NSF), we engaged in two linked studies. The first, a dissertation project directed by Oyuntsetseg Chuluundorj in 2005, permitted us to begin our work in four communities, stratified by ecology and by census-documented socioeconomic and health

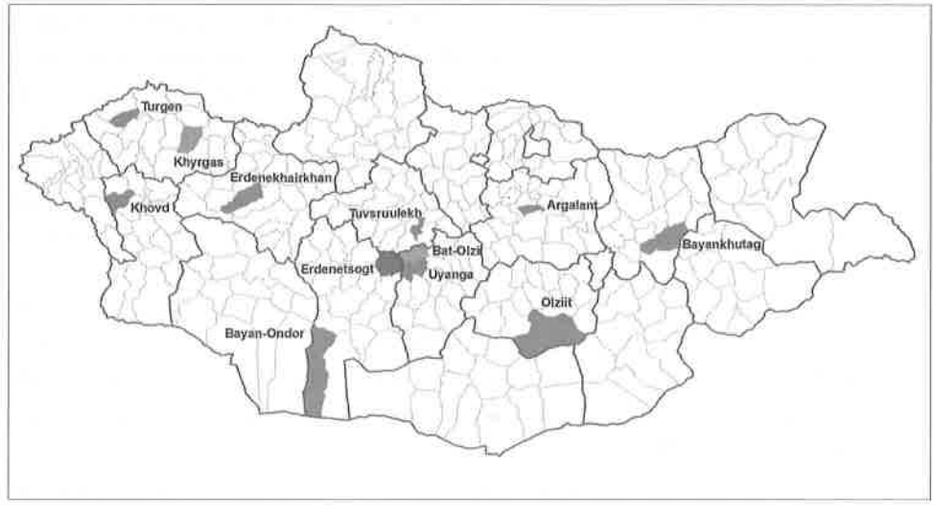

Figure 1.5. Map of Mongolia showing locations of research soums (shaded). Map by Craig R. Janes.

status: Bayankhutag soum in Khentii aimag, Khovd soum in Khovd aimag in the far west, Olziit soum in Dundgobi aimag, and Bayan-Ondor soum in Bayankhongor aimag (Chuluundorj 2006). With further support from NSF in 2006–2007, we expanded the study to include eight additional communities: Turgen and Khyrgas soums in Uvs aimag, Erdenekhairkhan soum in Zavkhan aimag, Tuvsruulekh soum in Arkhangai aimag, Uyanga and Bat-Olzii soums in Ovorkhangai aimag, Argalant soum in Tuv aimag, and Erdenetsogt soum in Bayankhongor aimag. Erdenetsogt, Bayan-Ondor, and Olziit are primarily desert-steppe ecosystems or in transitional zones (all are within or on the fringes of the Gobi Desert). The remaining are mainly composed of classic steppe grasslands; the soums farther north and west (Turgen, Khyrgas, and Tuvsruulekh) include areas that would be considered forest or forest-steppe. A map showing the location of these soums is presented in figure 1.5.[9]

In each of these communities we developed case studies of a minimum of thirty herding households, selected to the extent possible at random by using a transect sampling method.[10] The case studies involved collecting detailed information on the following: household demographics, including migration histories; household economics, including assets (livestock, housing stock, vehicles, appliances, other property), income and income sources, expenditures, and access to credit; patterns of social affiliation and access to resources through social networks; experiences with and perceptions of climate hazards and disasters; herding strategies employed; perceptions of changes in availability and quality of water and pasture resources; experiences with local governance; and household health and well-being, including self-reported assessments of health as well as objective measurements of blood pressure, body mass, and blood hemoglobin (a test for anemia). In each community we also talked

with soum officials in order to gain a sense of the soum, particular challenges experienced by local citizenry, presence of any development projects, and a bit of the history of the county both during and after collectivization. In addition to the household case studies, we also sought to develop socioeconomic, health, and meteorological profiles of all rural (N=250) soum.[11] These countrywide data permitted a general characterization of rural counties representing a range of ecologies, experiences with climate stress (based mainly on variability in precipitation and reported livestock mortality), and socioeconomic profiles (from relatively wealthy to very poor). These data also permitted us to put our sampled counties into a national context. Our study was also multi-ethnic: in one soum (Khovd) the majority of respondents were ethnic Kazakhs, the major non-Mongolian ethnic group in Mongolia, and in several others we included Mongolian-speaking, non-Khalkh ethnic groups such as Uriankhai, Bayad, and Buriat.

In several of the soums that we studied, mining activity emerged as a major challenge to local herders, providing opportunities as well as posing significant threats and challenges to livelihoods. We thus added a small qualitative study of thirty households that focused specifically on herders' experiences with mining and miners (both formal and "artisanal" or small-scale mining activities). Lesley Johnston, a master's degree student at Simon Fraser University, conducted and analyzed the results of these interviews (Johnston 2008). Twelve of the qualitative interviews were conducted in households that were part of the main study. An additional eighteen interviews were conducted with households that were not part of the main study sample. We address the issue of rural mining in detail in chapter 6.

In total we conducted 360 household case studies between 2004 and 2007, and added an additional eighteen qualitative interviews with the heads of herding households regarding their experiences with mining activities. The total number of individuals resident in these households, and from whom we collected information on health and well-being, was 1,897. In addition to the household case studies, we completed key informant interviews among soum administrators in the twelve study soums.

The data described above are the main sources of evidence discussed in the next several chapters. In table 1.1 we present the basic descriptive statistics of the study sample. As the table shows, the sampled households rely primarily on herding for subsistence and to generate income. Three-quarters of cash income is derived from the sale of live animals, animal fibers, dairy products, meat, and hides. The remaining one-quarter of incomes are earned from wage labor, collecting/making and selling products other than livestock (firewood, felt, gers, and furniture, etc.), and pensions and allowances. The mean herd size of just about 260 animals is slightly above what most development economists deem necessary to reasonably sustain herding and ensure livelihood security in the face of understood and predictable risks. There is, however, significant variability in the economic status of the households we studied; and, as shall be discussed in subsequent chapters, one of the more important of

Table 1.1 Characteristics of the sample (N=378 households, 12 rural soums)

Variable	Value (*standard deviation*)
Mean age of household head	41.2 years (*12.67*)
Gender of household head	Male 93.4% Female 6.6%
Marital status of household head	86.8% married 6.6% single 6.1% widowed 0.5% divorced
Years of education of household head	None 5.3% 1–6 yrs = 35.5% 7–10 yrs = 54.7% 11+ yrs = 3.7%
Total population of study soums in 2010[1]	35,856
Total population of study soums in 2000[1]	43,923
Percent population change, 2000–2010 censuses	-16.1%
Number of people per sampled household	5.02 (*1.89*)
Gender distribution of individuals in sampled households	52.5% males 47.5% females
Peak livestock loss rates, averaged for sample soums, during the 2000–2002 dzud periods	27.8% of livestock units lost; range of 15.9% to 50.1%
Livestock units (SFUs) per capita in sampled households, 2005–2007[2]	96.6 (*124.8*), median = 62.2
Livestock (head) per sampled households, 2005–2007	259.4 (*273.2*), median = 172.0
Goats	107.9 (*105.7*), median = 80.0
Sheep	118.6 (*174.1*), median = 60.0
Cattle (including yak)	15.5 (*19.4*), median = 10.0
Horses	15.3 (*25.0*), median = 10.0
Camels	2.1 (*6.0*), median = 0
Total reported annual income per capita (tugrik [tg])[3]	524,754tg (*515,859*), median = 379,620tg
Total reported expenditures per capita (tugrik)[3]	407,820tg (*345,657*), median = 322,500tg
Proportion of population in study soums below the poverty line, from census & UNDP analyses (Coulombe and Otter 2009)[4]	43.1%
Household percentage of income from herding activities	75.1% (*25.8*), median = 83.2%

1. Data source for county population figures: Government of Mongolia, National Statistical Office, 2000 and 2010 censuses.
2. A sheep forage unit roughly represents the quantity of forage consumed by the different species of animals. It is a way to standardize herd size according to consumption needs of the herd; SFUs also loosely represent the relative economic value of individual animals, although with the increasing importance of the cashmere trade, goats are considered by most to be more valuable than sheep. This metric varies by researcher and by region; here we calculate SFUs as follows: 1 sheep = 1 SFU, 1 goat = .9 SFU, 1 cow/yak = 6 SFU, 1 horse = 7 SFU, and 1 camel = 5 SFU. Livestock loss rates for each of the study counties are calculated from data provided by the National Statistical Office of Mongolia and the World Bank. The livestock loss rate = number of animals that died in the preceding year/herd size at beginning of the year – number of animals that died X 1000. This rate provides a relative measure of ten-year climate stress at the county level for the period preceding the study.
3. In 2006, the midpoint of our study, 1 USD = 1,179 tugrik.
4. Estimate based on extrapolation of the World Bank's Living Standards Measurement Survey of 2003 to counties based on 2000 census data (Coulombe and Otter 2009). This figure includes a large number of nonherding households living in soum centers. Coulombe and Otter note that rural, nonherding households are among the poorest in Mongolia. Livestock assets per capita are a better measure of poverty in herding households, although still a rough estimate.

post-transition changes in rural Mongolia is the appearance of substantial social and economic inequality.

Virtually all household heads are men; it is likely that, given labor demands, female-headed households may over time leave the rural economy for towns and cities. Household heads tend to be middle-aged with younger children in the home. The household size of five members is typical of rural Mongolia and reflects the preference for the constitution of households by nuclear families. Extended, especially stem, families are common coresidential groups (khot ail), although couples and their children tend to occupy separate gers. One legacy of the socialist period is the fairly high level of education and literacy among rural herders (though this is now declining). The majority of household heads, and this would be the case for all household members, have completed the primary grades, with nearly a third finishing secondary school. The mean number of years of education completed by all the individuals in our study (excluding children too young to begin school, but including those still in school) is more than six. Women and girls tend to receive more years of education than men and boys, a fact that holds across all of Mongolia, including in urban areas. The slightly higher proportion of males to females in the sampled households reflects the greater likelihood that girls, especially in their teens, were away studying, usually in a provincial center or in Ulaanbaatar.

Table 1.1 also shows a significant reduction in the population of study counties during the period from 2000 to 2010 (our research fell at the midpoint of two national censuses). In some counties the loss of population is greater than 50 percent. The only counties to have gained population are those where significant mining activity has attracted those seeking employment. As we have discussed, migration is driven primarily by losses of livelihood among active herders due to climate hazards (drought and dzud). The dzud of 2010 had a particularly devastating effect on the rural population.

All the households we studied practiced highly mobile pastoralism, although length and number of annual moves vary significantly by ecology and herd size. Overall, households moved on average more than seven times in the year prior to the study, and at the considerable mean distance of 168 kilometers. We will take up the issue of mobility, a particularly important post-transition adaptive strategy, in some detail in chapter 4.

In nearly all the counties we studied, livestock mortality data collected by the World Bank from 1970 to 2003 show that prior to our study the most disaster-prone years fell between 2000 and 2002, with livestock mortality rates greater than 50 percent in some soums. The years from 2003 to the time in which we conducted our study were generally benign in terms of winter weather, although several counties were experiencing drought at mid-decade. Mean livestock mortality rates for the sampled soums peaked between 2000 and 2002 at more than 25 percent of livestock units.

The Pastoral Commons and the State

The preceding excursion, from city to countryside, across Mongolia's many regions and through several research projects, anticipates the themes that we take up in the following chapters. First, the retreat of the state from effective management of the rural commons has exposed households to significantly increased risks. In good years, herds are growing quickly, even to the point of alarming herders, who realize that unfettered growth is a potentially destructive force on the pastoral commons, especially in situations where shortages of water and ecologically perverse market incentives lead to local overcrowding and overgrazing. Herd growth coupled with ineffective or absent management of public goods has led directly to vast climate disasters, propelling migration to towns and cities, where herders become the poorest of the poor.

Yet the role of the state is contested in contemporary Mongolia. Some see any efforts to manage the pastoral commons as a return to the heavy-handed socialist past. The market, they believe, will ultimately correct these problems, resulting in a more efficient and productive rural agricultural sector. Others are not so sure, pointing to the importance of cooperative management of both resources and risks to the long-term sustainability of the sector, especially in the face of climate change. A few, mainly European, development organizations have attempted to fill the newly yawning gap between the individual household and the state by experimenting with novel forms of social organization intended to replace some of the functions of the old collectives. But these cooperative institutions have not yet been shown to be effective. At the center of this debate is the question of the state, its role in the rural economy, and its authority in relation to the mitigation of pastoral risk.

This is not a novel question globally. A sizeable literature has grown up around the idea of adaptation to climate change, which in the larger context of the international failure to reduce greenhouse gas emissions has emerged as the main problem for planners. Given the realization of likely climate change scenarios (and current models project even more rapid changes than originally predicted), the main challenge to governments, intergovernmental organizations, and relief agencies is how to facilitate effective adaptation, that is, to reduce the potential for disaster. In the following chapter we review this literature, focusing on conceptual and theoretical formulations that we draw on in analyzing our data and proposing causal relationships.

two

What Makes a Climate Disaster?

There's something important to be learned when all hell breaks loose.

—attributed to the sociologist W. Lloyd Warner, cited in Hoffman and Oliver-Smith, "Introduction: Why Anthropologists Should Study Disasters"

The Dzud

The dzud is the most serious of climate risks faced by Mongolian herders. They will often speak of different kinds of dzud, operating either singly or in combination. For example, the "white dzud" refers to very heavy winter snowfalls that cover pasture grasses for long periods. The "ice dzud" describes conditions of freezing rain or sleet that covers pastures and make the grass inaccessible. The "black dzud" references a pattern in which severe summer drought is followed by a bitterly cold winter. Regardless of the term used, all describe a configuration of meteorological conditions that combine to pose a serious risk for starvation and hypothermia among herd animals and, in practice, the term is used to describe any combination of conditions that cause higher than expected rates of livestock mortality in winter (Murphy 2011). Dzuds may be quite localized or can affect large regions of the country. The

Table 2.1. Major dzud events, 1944 to the present

Year	Affected Places	Animal Loss in Thousand Head	Animal Loss as % of Total Livestock
1944–1945	9 provinces, 65% of total land	8,638.0	35.5
1954–1955	No information available	1,887.7	8.2
1956–1957	No information available	1,008.0	4.1
1967–1968	13 provinces, 80% of total land	3,800.0	17.0
1976–1977	15 provinces, 90% of total land	1,453.9	6.1
1993 spring	3 provinces, 30 soums	689.5	2.7
1996–1997	11 provinces, 69 soums	700.0	2.4
1999–2000	13 provinces, 158 soums, 70% of land	2,614.0	7.8
2001–2002	20 provinces	3,400.0	9.5
2010	13 provinces severely affected	8,500.0	20.0

Source: Chuluundorj (2006); Fernandez-Gimenez, Batjav, and Baival (2012); Government of Mongolia (2010).

major dzuds of the 20th century are linked primarily to a pattern in which summer drought, resulting in poorly nourished herds and the inability to gather sufficient fodder stocks, are followed by especially severe winters. Table 2.1 lists the major climate disasters of the past seventy-five years. Of the ten major dzuds reported in the literature, five have occurred since 1990, and herders in general report that the past decades have seen an increase in conditions related to disasters, especially warmer and drier summer seasons and warmer winters with heavier snows. This noted, it is also the case that dzuds have been, likely for a long time, a constant risk to herding communities. The dzuds of 1944–1945 and 1967–1968 were especially severe (the effects of the former likely exacerbated by wartime pressures on the agricultural economy; see chapter 3).

Based on climate models developed for Central Asia with downscaling to regions of Mongolia, the greater temporal frequency of dzuds noted in table 2.1 is likely related to longer-term patterns of change. Research reported by the Intergovernmental Panel on Climate Change (IPCC) predicts warmer, drier summers with increasing drought events, and somewhat warmer, wetter winters (Batima et al. 2007; Cruz et al. 2007). These trends were especially notable for the ten-year period of 1993–2002. We used available data from the meteorological department of the Mongolian government in order to develop a sampling frame for our research: we sought to identify study soums where there had been different experiences with severe climate. Analysis of these data showed rather striking increases in summer temperatures during the ten-year period prior to our research. Among the study sites we selected, mean summer temperatures had increased by about three degrees centigrade across most ecological zones (desert, steppe, forest), and there were striking declines in summer precipitation, with some soums experiencing severe drought in 2002. In meteorological terms, ten-year data are but a snapshot and can simply represent natural

variability (recall that the Mongolian steppe ecosystem is for the most part a highly variable ecosystem in disequilibrium). Indeed, in the mid-2000s several summers were abnormally cool and wet. However, more recent research that has focused specifically on Mongolia has affirmed that overall the climate trends for the country are generally consistent with regional IPCC data and with our ten-year sampling of temperature and precipitation (Bayasgalan et al. 2009).

A Mongolia climate change adaptation project, supported by the Netherlands Climate Assistance Program (NCAP) and the World Bank, has also documented increasing temperatures and decreasing levels of summer season precipitation, with adverse impacts on vegetation (Bayasgalan et al. 2009). The NCAP "weADAPT" project climate models predict a high temperature increase of 5–7 degrees Celsius across Mongolia during the summer season by 2100, with somewhat lower levels of increase in winter and autumn. Although summer precipitation is expected to increase in the mountainous regions, precipitation elsewhere is predicted to be more variable, with greatest decreases to occur in the northwestern part of the country. Building in estimates of drought, dryness, and temperature, the climate model predicts a much higher frequency of dzud events, especially in northwestern regions. In 2070 to 2100, for example, the predicted frequency of dzuds is greater than once every two years in the far northwestern part of the country.

These data indicate that many Mongolian herders will experience an increasingly variable climate with greater potential for disastrous dzuds. The production of dzud disasters—high levels of livestock mortality and related livelihood loss and urban migration—is not, however, inevitable. Climate change is just one part of the story. The other, and, we argue here, more important, part has to do with the capability of herders to respond or adapt to these changes. Our position is that the dzud is not just a "natural" hazard—that is, external to and independent of human agency—it is a result of interacting ecological and social forces. This position is consistent with the well-established principle in hazards research that nature and culture are mutually dependent in producing disastrous outcomes (Biersack 2006; McCabe 2002; Oliver-Smith 1996, 2002). The extent and severity of disasters—how many are affected, in what way, and to what consequence—are nearly always a product of the political, economic, and social processes that together lead to "a socially and economically produced condition of vulnerability, resulting in a perceived disruption of the customary relative satisfactions of individual and social needs for physical survival, social order, and meaning" (Hoffman and Oliver-Smith 2002:4). (See also Adger et al. 2004; Cutter et al. 2003; Hoffman and Oliver-Smith 2002; Oliver-Smith 2002; Wisner et al. 2004). So, while the climate factors that lead to the dzud are exogenous to the activities of herders (i.e., global carbon emissions), we argue that the effects of the dzud in terms of livestock mortality and related social and economic consequences are not.

Many models and theoretical propositions have been advanced to account for and predict vulnerability to climate hazards. These models vary according to the

primacy given to the hazard itself, the scale of analysis, and the determining role of the political-economic context. Hazards scholars have emphasized the difficulty of trying to identify complex causal assemblages across time and space and point to the need to carefully conceptualize the dynamics of risk and vulnerability within a specific narrative frame, namely, the putting into motion of key variables within a single disaster scenario (Wisner et al. 2004). There are two important elements to such a narrative: describing causes and effects in specific places—each configured by particular productive regimes, patterns of social relations, structures of power and control, and access to resources—and discovering and analyzing how people's knowledge and construction of their environment and their interactions with it provide a basis for coping or risk-managing behaviors (see, for example, Biersack 2006; Escobar 1999; Wisner et al. 2004). Honoring these two elements in any program of research requires a careful balancing of additional dialectics: the relative influence of structure and agency in people's responses to bioenvironmental hazards, and the potential explanatory tensions created in acknowledging the causal relevance of people's own constructions of their environment and of risk inherent in that environment, as well as materialist (objective) conceptualizations of risk and consequence. Disasters do not only "come into existence in both the material and the social worlds and, perhaps, in some hybrid space between them," they also "occur at the intersection of nature and culture and illustrate...the mutuality of each in the constitution of the other" (Oliver-Smith 2002:24).

Mindful of these tensions, we develop in the remainder of this chapter a brief conceptual and theoretical framing of the question of how and why dzud events turn into weather disasters for Mongolian herders. This framing draws on the considerable scholarship on disaster and disaster response in geography and development studies, as well as on ethnographically grounded work in political ecology and environmental anthropology. Because we are also concerned here to sketch out links between disaster and individual well-being, we draw on work in critical medical anthropology and social epidemiology that proposes pathways through which vulnerability to disaster is embodied.

Theorizing Vulnerability

A focus on climate change and its impacts has produced a large volume of literature on vulnerability. Despite the tendency for researchers, depending largely on their disciplinary orientation and scale of focus (from local to global), to propose somewhat different causal frameworks, a generally consistent approach to the social production of disaster has emerged. This approach theorizes disaster on the one hand as an *outcome* of the pressures induced by characteristics of the *hazard* itself—its duration, its intensity, and its effects on particular social spaces—and on the other hand the social, political, and economic processes that make these spaces *vulnerable* to the hazard. Vulnerability here is generally defined as the "characteristics or features of a group or community that affect or influence their abilities to anticipate, adapt to, and recover from the effects of a hazardous event" (Wisner et al. 2004:49). Vulnerability in the face of disaster leads to several linked adverse outcomes: death, sickness, loss of livelihood, and poverty. While hazards may not be modifiable by human agency, vulnerability is: disaster prevention hinges on the mitigation of those processes that produce it. The natural event is, in effect, a "trigger" of a chain or cascade of events, the course of which is determined by social processes that range from the effects of globalization to those factors that determine access to resources or unequal exposure to hazards at a local level (Birkmann 2006; Blaikie and Brookfield 1987; Cutter et al. 2003). Disaster is never inevitable but "occurs when a significant number of vulnerable people experience a hazard and suffer severe damage and/or disruption of their livelihood system in such a way that recovery is unlikely without external aid" (Wisner et al. 2004:50). The determinants of vulnerability may be framed in terms of progressive tiers of influence or causation, ranging from people's limited access to power and resources as determined by political economic and ideological structures to the production of unsafe places and conditions.

The significance of this framing of the problem is its recognition of the important temporal and spatial dimensions of vulnerability, especially in ordering chains or cascades of cause and effect that originate in the global political economy. However, as both critics and advocates recognize, and as is often the case in political economic analyses more generally, patterns of cause and effect at specific places and social positions lack both specificity and sufficient attention to local responses and coping capabilities (Wisner et al. 2004). Although the construct of vulnerability as developed by hazards researchers is inclusive of agency, the semantic properties of the term, and its profligate use to describe marginal people and populations, may lead to conceptual muddiness or a belief that those so labeled are passive victims.

To avoid this problem, scholars and planners invoke such ideas as adaptation and resilience, although these concepts are themselves fraught with definitional problems. For example, who or what is it that adapts? And what is the result of adaptation? A protection of or return to stability, or social transformation? Similarly, the idea of resilience, especially given its origin in the biological and ecological sciences, is also inherently conservative in that it mainly asks whether people and their society can maintain stability in the face of climate hazards. A new language is probably needed here, one that honors the agency of individuals, households, and communities while simultaneously incorporating the historical, political, and economic processes that create vulnerable systems and places.

While there is no single approach that would manage such a complete and comprehensive analysis of complex ecosocial processes at multiple levels of analysis, here we have chosen to study vulnerability through the lens of livelihood security (Frankenberger et al. 2002). From an anthropological-ethnographic perspective, the livelihoods approach has an important benefit: it permits a fine-grained analysis of household-level actions in the context of social history and political economy.

Livelihood Security and Social Capital

Derived in part from the pathbreaking work of the economist Amartya Sen (Chambers 1987; Scoones 1998; Sen 1984), a livelihood may be defined as consisting of "the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones 1998:5). The livelihood security framework proposes an analysis that breaks down livelihood into contextual factors, access to critical resources (including, importantly, social resources), and bundles of adaptive or coping strategies. By not reducing livelihoods to economic security, the framework also emphasizes an expanded view of well-being that includes, most importantly, how people themselves both define and strive to achieve it. Writes Ian Scoones,

> Given a particular *context* (of policy setting, politics, history, agroecology and socio-economic conditions), what combination of *livelihood resources* (different types of "capital") result in the ability to follow what combination of *livelihood strategies* (agricultural intensification/extensification, livelihood diversification and migration) with what *outcomes?* Of particular interest in this framework are the *institutional processes* (embedded in a matrix of formal and informal institutions and organisations) which mediate the ability to carry out such strategies and achieve (or not) such outcomes. [1998:3, emphases in the original]

On the face of it, the processes that lead to livelihood security are fundamentally similar to those that reduce vulnerability to disaster. However, disaster researchers are quick to point out that vulnerability is a dynamic and contextually dependent phenomenon: it can only be understood in relationship to a specific configuration of hazards (Adger et al. 2004; Birkmann 2006; Cutter et al. 2003; Wisner et al. 2004). They argue that vulnerability can only be assessed under circumstances in which it is important in determining a particular outcome; that is, it is not necessarily an inherent state of a system. However, the livelihood model and our position here is that vulnerability, glossed as livelihood insecurity, may be defined both as a state of a system and as a consequence of exposure to shocks and stresses. But this distinction—vulnerability as expressed principally under hazardous conditions, versus vulnerability as a state of affairs—may simply be overdrawn (Oliver-Smith 2002). Normal life for some may be "on the edge," reflected in a poor access profile with little flexibility or range of choice in responding to hazards (Wisner et al. 2004). This would suggest a dynamic continuum of resilience, ranging from those in a persistent state of vulnerability to those whose vulnerability is highly contingent on the hazard itself. Under such conditions application of a livelihood security framework with an emphasis on adaptation and coping in social, political, and economic context offers an alternative approach that may avoid some of the conceptual and linguistic pitfalls of vulnerability theory.

One important dimension of coping and resilience that has been considerably elaborated in development economics is that of "social capital" (Grootaert 2001).

Social capital has a long history in the social sciences, and overlaps with early work on social networks conducted by anthropologists studying urbanization, identity, and social change in southern Africa (Mitchell 1969). Social capital is also integral to sociological theory, deriving from the research and writing of Durkheim, Bourdieu, Portes, Putnam, Coleman, and others (Portes 1998). In economic terms, social capital could be considered an "input" to a household's (and by extension a community's, or even a nation's) productive functions. Simply put, it represents the capacity for households to gain access to various benefits through social relationships. In the context of economic development, Christiaan Grootaert and colleagues (2004) suggest that social capital has six relevant dimensions: the extent of individuals' participation in various social organizations and informal networks; level of trust toward neighbors, government, and strangers; extent of collective action and cooperation with other community members on joint initiatives; quality and extent of access to information and to communication channels; the level of cohesion or conflict in communities; and the degree to which people feel empowered, effective, and capable of influencing political outcomes within their communities. Examined on a household level, these dimensions of social capital reveal a great deal about access to livelihood resources through various social network and group linkages as well as about people's access to and engagements with formal and informal institutions.

Research suggests that measures of social capital help explain income levels, access to credit, capital accumulation, and collective action (Grootaert 2001). In transitional settings, such as Mongolia, assessments of social capital represent an important way to identify the processes of social change subsequent to the weakening and restructuring of government and the impact of these changes on the security of individual households. And while the concept of social capital has been subject to substantial critique—namely, in reducing human sociality to ideas of ownership, exchange, and accumulation[1]—it remains a useful construct, when carefully applied, for assessing the degree to which social relationships can support and sustain livelihoods in the face of exogenous stresses and challenges. Also, social capital has been shown to positively affect health by providing beneficial psychological and instrumental supports to individuals and households. In chapter 5 we explore the impact of social networks, support, and "capital" on livelihood security in some detail. We will argue that access to social capital is one of the primary determinants of livelihood security among Mongolian herders in the current context of neoliberal governance. We also find that it has an important effect on health and well-being (chapter 7).

In summary, and by way of framing our analytical approach, we define vulnerability as deriving from the global political economy and the ideological forces that are part of it; the dynamic pressures operating from macro through to local levels by and through which these root causes produce unsafe conditions; and the characteristics of these unsafe conditions as they manifest themselves in the physical environment, the local economy, patterns of social relations, and public institutions and actions in particular places (Wisner et al. 2004). Within these places a focus on the

determinants of livelihood security helps us understand patterns of local variability in response to climate hazards. The dimensions of livelihood security encompass the bundles of social relationships, access to resources, and resourcefulness that together constitute coping capacities in the face of climate stress. While vulnerability is a dynamic construct—expressed when systems and people are under stress—it may to some extent be part of the normal order of things, a characteristic of those on the edge, reflective of exclusionary forces that threaten to push people into conditions of chronic poverty and all that it entails in terms of ill-being.

The Problem of "Risk"

When cast in a predictive or preventive light, analyses of disaster often center on assessments of risk. In some models, for example, the risk for disaster is proposed conceptually as a simple arithmetic product of hazard and vulnerability (Wisner et al. 2004); that is, given a particular hazard (hurricane, flood, or dzud), what are the probabilities of an adverse outcome given people's access to resources, existing infrastructure, and institutional capacities? This conceptualization of risk is mainly a problem of assigning some measure or probability to an adverse outcome. Economists and public health scientists tend to view risk in an analogous fashion: as a measurable probability that a certain outcome might come to pass, based typically on statistical or mathematical modeling. It is important, though, to distinguish this conceptualization of risk from a more general and less specifiable idea of uncertainty in which defined probabilities may not, or cannot, be assigned (Carney 1998; Farrington et al. 1999; Frankenberger et al. 2002; Roncoli et al. 2009; Scoones 1998).

A second conceptualization of risk focuses on how risk is perceived and managed by those experiencing it. It is to a considerable degree inherent in the coping capacities or adaptive strategies that comprise livelihood security in the models of vulnerability presented above: it is the perception of risk and resulting attempts to manage uncertainty that drive action at multiple levels to minimize adverse outcomes. This application of the term recognizes that risk and uncertainty are socially and culturally constructed and that strategies for coping with uncertainty may draw on stores of local, indigenous knowledge of a place, and on the repertory of past responses to adverse conditions and their various observed and transmitted effects (Oliver-Smith 2002; Paine 2002; Swift 1999, 2007).

How then do we define and apply the concept of risk in theorizing vulnerability and livelihoods here? Here we follow the lead of Jeremy Swift and Guy Templer and colleagues, who stress the importance of identifying and differentiating who experiences what kinds of risk: individual households or communities (Swift 2007; Templer et al. 1993). Individual households may experience events that other households do not—for example, illness of family members that affects the supply of necessary labor, animal theft, or animal disease. Conversely, larger groups of households may share exposure to dangers associated with insect infestation, fire, or heavy snow. In

contrast to "individual risks," these may be termed collective or "covariate" risks. Each class of risk or uncertainty demands a different response strategy, although as Swift (2007) notes, it may be difficult to disentangle individual from covariate strategies across the repertory of possible responses. Importantly, this conceptualization of risk management focuses on its temporal quality, stressing the importance of risk prevention or reduction, risk mitigation, risk preparedness and reactions to disaster, and disaster recovery. Although this may imply that risk is episodic and infrequent, it is important to recognize that management of uncertainty in arid rangeland ecosystems is really part of the normal course of affairs and thus inherent in the social and cultural processes that govern the relationship between people and their environment (McCabe 2002). In this book we thus define risk as culturally constructed, socially contingent, and complex. Responses to it are held firmly in the sway of configurations of opportunities and constraints that range outward from the household to the state (and possibly beyond) (Murphy 2011). For pastoralists, managing such risk is fundamental to maintaining a secure and sustainable livelihood and avoiding disaster.

Livelihood Security, Vulnerability, and Health

Health is both essential to and an outcome of livelihood security. Three pathways are relevant here. First, the conditions for secure and sustainable livelihoods also generate over the long-term sufficient resources for the household production of health: for example, adequate food; shelter; and resources needed to access medicines, health technology, and health knowledge (Galvin 2009; Roncoli et al. 2009). This causal pathway foregrounds the effects of poverty on health and well-being, as well as calls attention to patterns of authority, power, and knowledge within the household. Second, the political-economic and institutional contexts and processes that influence livelihood security also reflect the availability of essential health resources. This pathway identifies resources external to the household that either enable or constrain access by household members to health care, public health programs, and health knowledge (which often indexes access to other social resources). Third, an important component of embodiment theory references the pathways through which aspects of social exclusion, marginality, and social incongruity are integrated biologically to produce patterns of ill health. Many social epidemiologists and medical anthropologists have defined this as a biological response to social conditions—for example, racism, relative social inequality, inability to engage in culturally appropriate behaviors—and have defined how these might provoke a disease process or influence general levels of susceptibility through neuroendocrine or neuroimmunologic pathways (e.g., Dressler 2001; Janes 1990; Krieger 1994, 2000, 2001). Assessing health outcomes thus involves identifying the multiscalar processes, from political economy to processes at the level of the household, that affect these three pathways, either singly or, more likely, in combination. In chapter 7 we examine the relationship between livelihood security and health across Mongolia in each of these contexts.

Wider Theoretical Implications of Disaster Research

The sociologist W. Lloyd Warner suggested that one could learn a great deal about how societies work "when all hell breaks loose" (quoted in Hoffman and Oliver-Smith 2002:5; Warner 1947). As we have noted, disasters are a product of a host of interacting processes. When they occur they throw into sharp relief underlying conflicts and contradictions in a society that might otherwise go unnoted or unremarked: "Disasters present conjunctural opportunities for documenting linkages among such features as intensification of production, population increase, environmental degradation, and diminished adaptability and also provide opportunities to delve into human social realms and cultures" (Hoffman and Oliver-Smith 2002:6).

This book explores these opportunities and realms. The impact of dzud disasters, as we will see, is not confined to rural-dwelling Mongolian herders. One consequence of herders' attempts to cope with climate risk is changing patterns of spatial and social mobility. City, town, and rural pasture have become increasingly integrated through the deployment of social networks based largely on kinship, but expanded to include other patterns of social affiliation, such as patronage and absentee herding. People move through these networks, often with great facility, and it is increasingly difficult to differentiate town from country. The impact of climate hazards, as mediated by the political economic context, is an important determinant of this mobility. So, while this book begins with a study of the dzud and its consequences among rural herders, analysis will necessarily extend to town and city. The configurations of political economic and institutional factors that constrain and channel patterns of rural livelihoods also explain in large part what is going on throughout Mongolia. As with herders, our argument will be both flexible and mobile, starting on the rural steppe, but finding its way, perhaps inevitably, to the squatter settlements on the outskirts of Ulaanbaatar. The dzud, we will show, is very much a problem that transcends conventional boundaries and in the final analysis provides an analytical window on the failures of neoliberal economic development and the production of social suffering in post-transition Mongolia.

In order to fully comprehend the changes that herders have faced over these past two decades, we need to consider what is known historically about governance of the rural commons. In the following chapter we provide an analysis of Mongolian pastoralism from the feudal period to the present, emphasizing the late 19th and early 20th centuries. In the final part of the chapter we focus on the economic transition that began in earnest in 1991 and, to some degree, continues today. Here we take up an important question: to what extent was Mongolian herding integrated into state-level political economic processes and what happens when development weakens state controls and supports? Chapter 3 underscores the negative impact that the transition had on institutions that had successfully reduced vulnerability.

three

Herders and the State

[Collectives] were a colossal mistake.... Mongolia has the same number of livestock now as 50 years ago because this system didn't work.... Our new government has to eliminate them quickly. We need to return the animals to the nomads and let them operate as they did traditionally...under a free market economy.

—Academician Sodnam, president of the Mongolian Academy of Sciences, 1990, quoted in Goldstein and Beall, The Changing World of Mongolia's Nomads

We have too many animals. Government needs to do something about this.

—Herder in Uvs province, June 2006, discussing the causes of pasture degradation

Susceptibility to climate disasters is a result of two opposing forces: the extent and severity of the hazard itself, and the underlying political, economic, and social relations that lead to vulnerability and livelihood insecurity. A central question regarding vulnerability in rural Mongolia is how households, communities, and other social and political institutions contend with the dimensions of unpredictability, or risks, that characterize the pastoral productive system. Although some of these risks may be specific to individuals and households, most, especially those