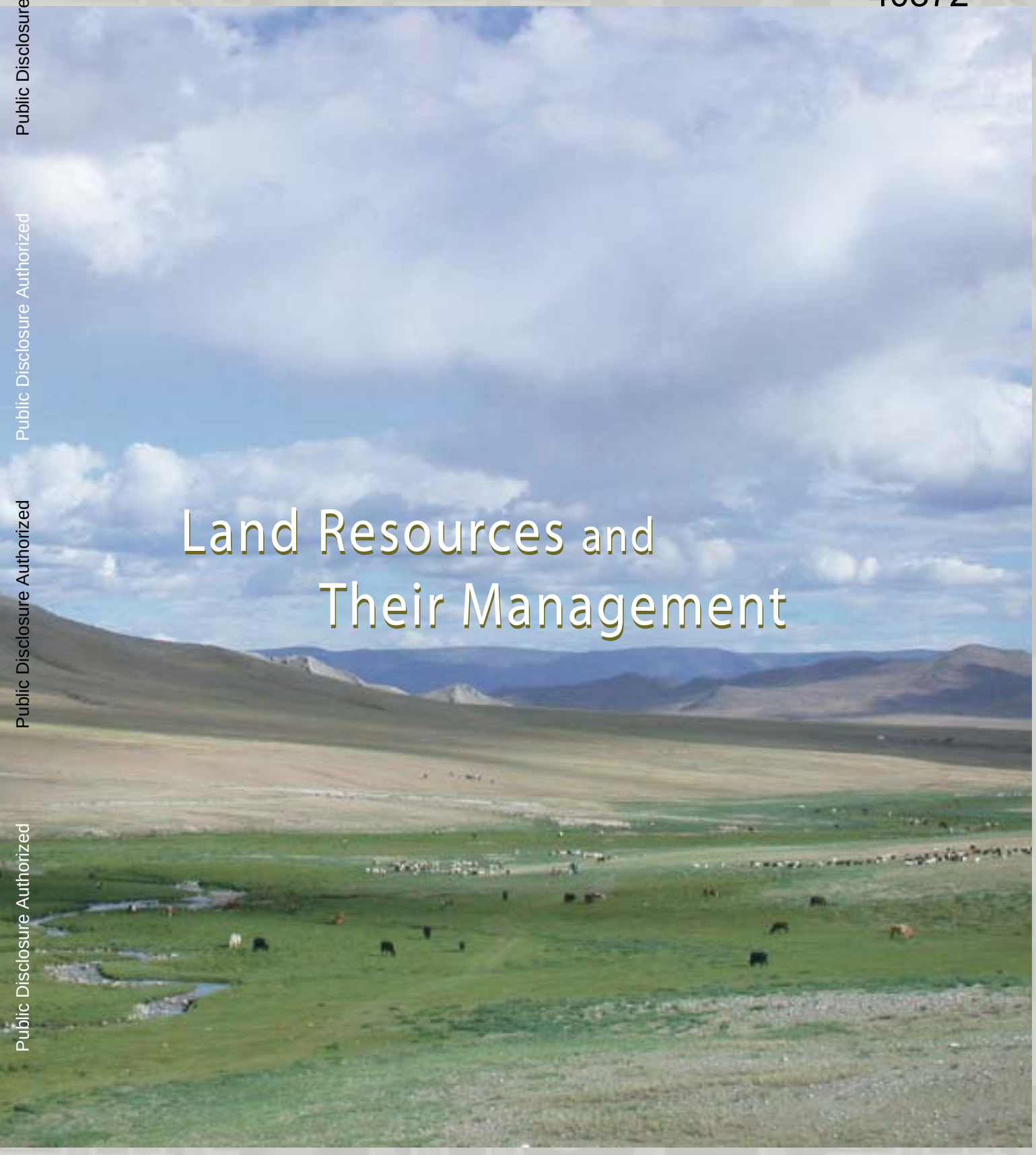
MONGOLIA
Environmental Monitor 2003
40872



Land Resources and Their Management

THE WORLD BANK

MONGOLIA

ENVIRONMENT MONITOR 2003

Land Resources and Their Management

THE WORLD BANK

Contents

The International Bank for Reconstruction and Development / THE WORLD BANK
1818 H Street, NW
Washington, DC 20433

The World Bank Mongolia Office
Ulaanbaatar, 11 A Peace Avenue
Ulaanbaatar 210648, Mongolia

First printing June 2003

This document was prepared by a World Bank Team comprising Messrs./Mmes. Anna Corsi (ESDVP), Giovanna Dore (Task Team Leader), Tanvi Nagpal, and Tony Whitten (EASES); Robin Mearns (EASRD); Yarissa Richmond Lyngdoh (EASUR); H. Ykhanbai (Mongolia Ministry of Nature and Environment). Jeffrey Lecksell was responsible for the map design. Photos were taken by Giovanna Dore and Tony Whitten. Cover and layout design were done by Jim Cantrell.

Inputs and comments by Messrs./Mmes. John Bruce (LEGEN), Jochen Becker, Gerhard Ruhrmann (Rheinbraun Engineering und Wasser - GmbH), Nicholas Crisp, John Dick, Michael Mullen (Food and Agriculture Organization), Clyde Goulden (Academy of Natural Sciences, Philadelphia), Hans Hoffman (GTZ), Glenn Morgan, Sulistiovati Nainggolan (EASES), and Vera Songwe (EASPR) are gratefully acknowledged.

Mongolia's land resources are of global importance, and central to the country's well-being and its economic development. Yet, these resources are facing mounting threats.

With a territory of 156.4 million hectares (ha) and a population of only about 2.4 million, Mongolia ranks first in the world for per-capita land area (0.6 km^2 /per person in 2001). Approximately, 82 percent of the land area is grassland, and represents the largest remaining contiguous area of common grazing in the world, which encompasses a wide range of ecosystems, including desert-steppe and forest-mountain steppe.

In the past two decades, a combination of human actions and natural causes has led to a significant decline in land quality. Human causes include changes in conventional livestock husbandry, overgrazing, and weak protection against intensive exploitation for traditional uses. Natural causes include a harsh and dry climate, short growing seasons, and light and thin soils. As a result of these changes, livelihoods that are closely connected to the land have been adversely impacted. Most importantly, the smaller and poorer herders are more likely than ever to lose their incomes when facing harsh winters or fluctuating market conditions.

As Mongolia completes its transition from a centrally-planned to a market economy, it is critical that the Government promotes a better understanding of the importance of sustainable land management. To this end, in addition to updating the body of laws regulating the ownership and use of land resources, the Parliament has recently passed the Land Privatization Law. The Ministry of Nature and Environment proclaimed 2002 as the Year of the Land for Mongolia; the Government is working with international and non-governmental organizations to raise awareness about the causes of land degradation, and to disseminate information on policies and practices that would improve land management. However, effective implementation of these initiatives requires the analysis of trends and monitoring of key indicators, and an improved understanding of the complex interactions between natural and institutional causes of land degradation.

The 2003 Mongolia Environment Monitor is divided into four sections. The first presents an overview of the state of land resources, and the pressures they face. The second, focuses on the relationships among land, poverty and livelihoods, while the third outlines key features of Mongolia's land management legislation and institutions. The final section presents the main land management challenges.

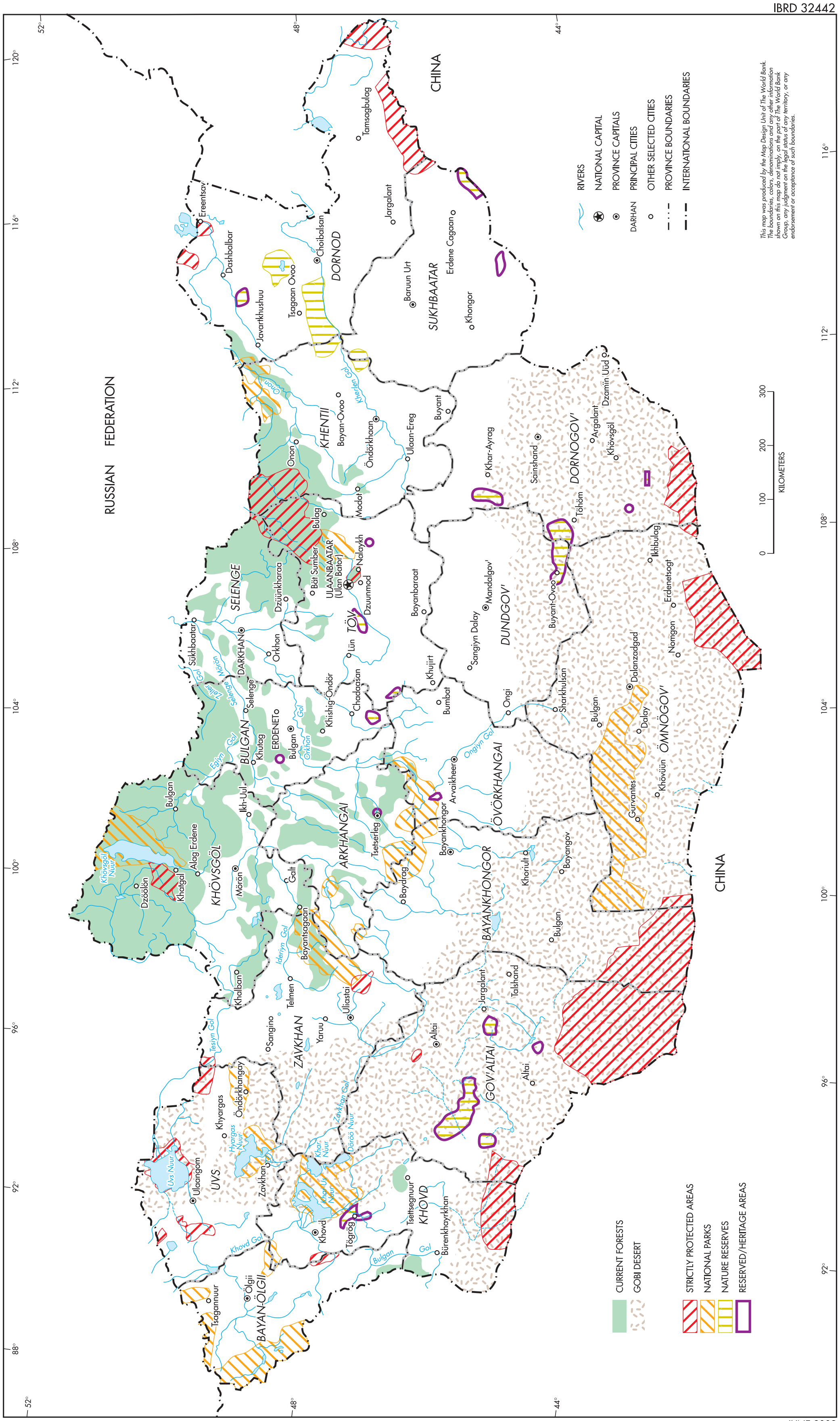
The information contained in this report has been obtained from many sources. These include reports published by government agencies, universities, NGOs, the World Bank, bilateral donor agencies, and unpublished academic reports.

This issue of the Monitor was prepared by the World Bank East Asia Environment and Social Development Unit in collaboration with the East Asia and Pacific Rural Development and Natural Resources and Urban Development Sector Units, and the Mongolian Ministry of Nature and Environment.

Abbreviations and Acronyms

ADB	Asian Development Bank
ADB	Asian Development Bank
GDP	Gross Domestic Product
GoM	Government of Mongolia
ha	hectares
IFAD	International Fund for Agricultural Development
km	kilometer
km^2	square kilometer
m^3	cubic meter
MAP 21	Mongolia Action Plan for 21st Century
MFA	Ministry of Food and Agriculture
MI	Ministry of Infrastructure
MIT	Ministry of Trade and Industry
MNE	Ministry of Nature and Environment
NEAP	National Environmental Action Plan
NGO	Non-governmental organization
NPACD	National Plan to Combat Desertification
SU	Stock units
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

IBRD 32442



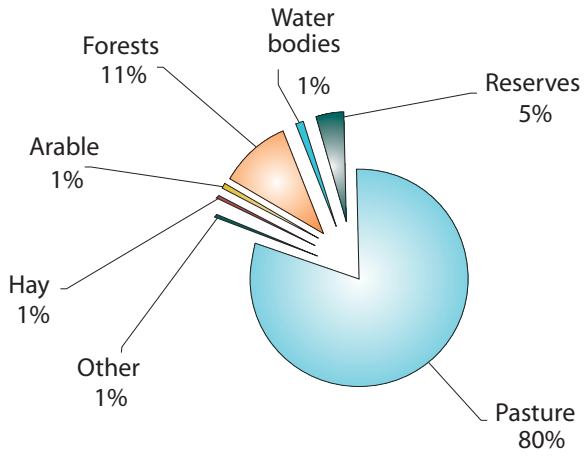
JUNE 2003

Mongolia has a land area of approximately 1.56 million square kilometers (km²). Mongolia may be one of the most sparsely populated countries in the world, however, land area per capita has fallen by a factor of four from an average of 2.4 km² in 1919 to 0.6 km² in 2001 due to rapid population growth.

Grasslands and arid grazing make up approximately 80 percent of the land area; it encompasses a wide range of biogeographical zones: high mountains, mountain taiga, mountain steppe, dry steppe grassland, Gobi desert-steppe, and desert. Forests cover 11 percent of Mongolia's territory; and wetlands, including marshlands, add a further 15,000 km².

Arable land has declined from around 10,000 km² in the early 1990s (then under mechanized state farms) to a little over 7,000 km² in 2001, representing at most one percent of Mongolia's land area. Less than a third of arable land was sown by 2001. This is partly because of the traditional Mongolian practice of rotational strip-fallowing, but declining state subsidies for agriculture, have also resulted in smaller investment in irrigation and other inputs.

Land Use Area, 1998



Source: *Authors.*

Horses grazing in pastures in Eastern Khovsgol aimag.

GRASSLAND AND DESERT

Grasslands in Mongolia have a very short growing season, limited by cold temperatures, and by low and highly variable precipitation. Pasture growth begins in mid-May and usually ceases after mid-August. Frosts can set in as early as the end of August, and end as late as June. The thermal growing season is shorter in the mountains and longer in the Gobi, despite a more variable rainfall. Of the approximately 80 percent of area that is under grassland and arid grazing, around 27 percent may be classified as forest/mountain steppe; 30 percent as dry steppe grassland, and the remaining 43 percent as Gobi desert-steppe and desert.

Given the presumed association between land degradation and patterns of grassland use by livestock and their herders, it is of utmost importance to understand how distinct ecosystems respond differently to grazing pressure. In most of the world's dryland grazing ecosystems, grazing pressure is but one of the features responsible for changes in vegetation condition. In the most arid areas, variation in precipitation is a better predictor of vegetation condition than is grazing pressure.

Virtually all of Mongolia's rangeland is in arid and semi-arid areas where the coefficient of inter-annual variation in precipitation ranges from around 28 percent in mountain-steppe areas, to 50 percent or so in desert-steppe areas.[1] It has been predicted that in areas where the inter-annual variation in precipitation exceeds 33 percent, range vegetation condition tends to be more influenced by levels of precipitation than by changes in grazing pressure.[2] This implies that Mongolia's rangelands would be expected to conform to the characteristics of 'non-equilibrial' as opposed to 'equilibrial' grazing systems .

There are few rigorous studies of rangeland vegetation dynamics in Mongolia that draw on field observations. Those that do, suggest that the intensity of use by grazing livestock, and inter-annual variations in precipitation, both play a role in influencing vegetation condition. In the mid 1990s, vegetation condition in desert-steppe areas (measured in terms of standing biomass, vegetation cover and composition, and species richness and diversity), was found to be significantly influenced by inter-annual precipitation but not so by changes in grazing pressure. In mountain-steppe and steppe areas,

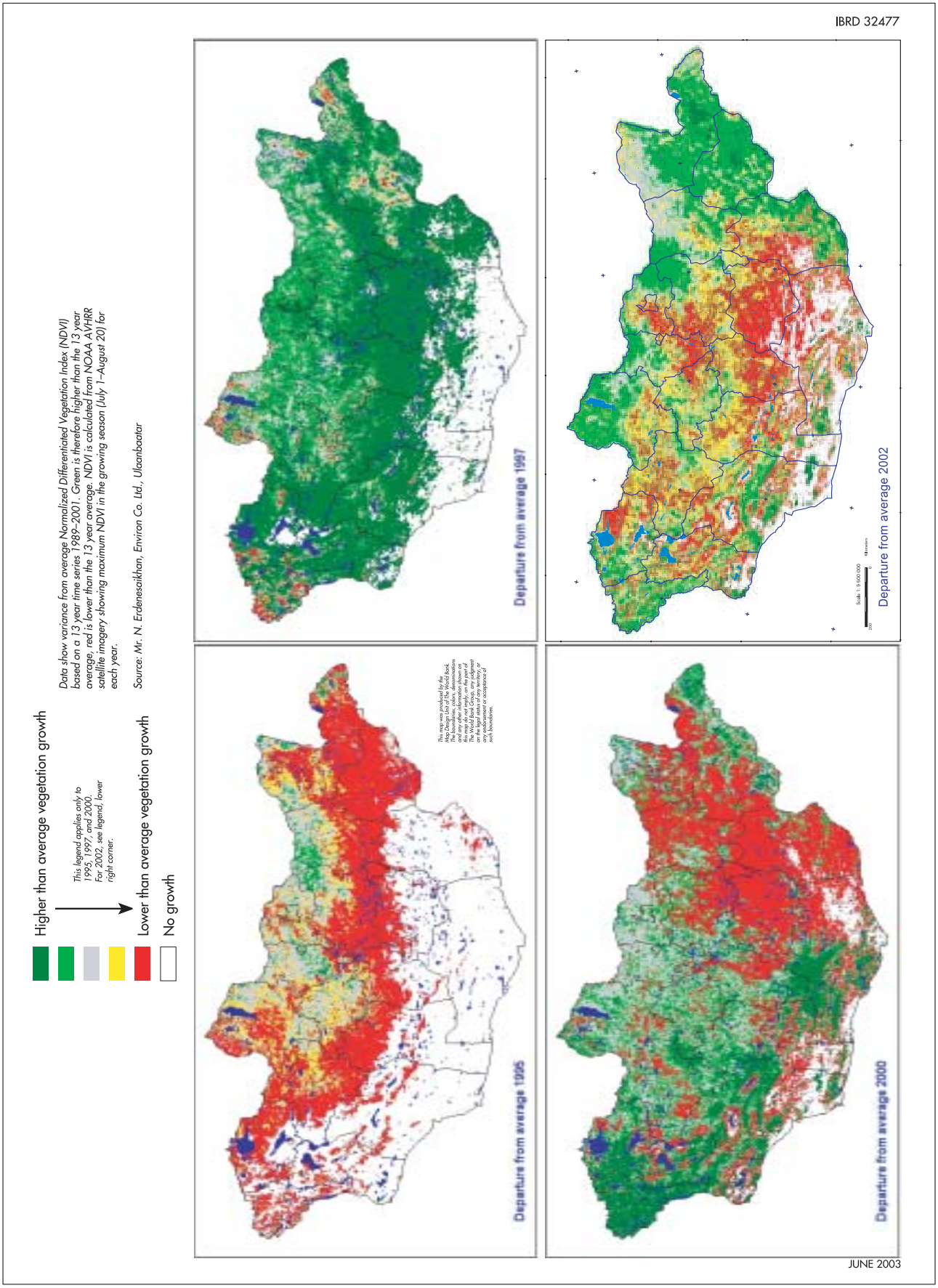
EQUILIBRIAL- NON-EQUILIBRIAL CONTINUUM IN GRAZING ECOSYSTEMS

The 'new' thinking on range ecology highlights the distinction between equilibrial and non-equilibrial ecological systems. This is not an either/or distinction, but rather a continuum. At one extreme, relatively equilibrial systems have two characteristics: the density of grazing livestock explains a significant amount of the variation in vegetation dynamics over time; and conventional range management techniques such as maintaining appropriate stocking rates remain most suitable for sustainable grassland management. At the other extreme, relatively disequilibrial systems are those in which livestock populations and vegetation dynamics are only loosely coupled. Density-independent factors, such as precipitation, explain a higher amount of variation in vegetation dynamics.

Typical pastoral management adaptations to such spatial and temporal variability include 'tracking' available nutrition from natural grazing and browsing, usually by moving from area to area. Annual rainfall totals and/or the coefficient of variation in annual precipitation is often taken to be a proxy for this continuum, given that more arid areas tend to experience greater inter-annual variability in precipitation.

While many of these insights are derived from empirical work in African savanna ecosystems, a steadily growing body of work shows that they are also relevant to other pastoral production systems, including Mongolia. What emerges from this work is a more nuanced view of the importance of mobility and flexibility in pastoral land tenure and resource access, without rejecting outright the need to consider density-dependent grazing pressure as well.

Source: Bruce, John and Robin Mearns. 2002. "Natural Resources Management and Land Policy in Developing Countries: Lessons Learned and New Challenges for the World Bank." Drylands Programme. Issues Paper No. 115. London: International Institute for Environment and Development.


IBRD 32477
Departure from average 1997
Departure from average 2002
Departure from average 1995
Departure from average 2000
Higher than average vegetation growth
This legend applies only to 1995, 1997, and 2000. For 2002, see legend, lower right corner.
Lower than average vegetation growth
No growth
Data show variance from average Normalized Differentiated Vegetation Index (NDVI) based on a 13 year time series 1989–2001. Green is therefore higher than the 13 year average, red is lower than the 13 year average. NDVI is calculated from NOAA AVHRR satellite imagery showing maximum NDVI in the growing season (July 1–August 20) for each year.
Source: Mr. N. Erdenesaikhan, Environ Co. Ltd., Ulaanbaatar
JUNE 2003

increasing grazing pressure led to declines in grass cover, while the growth of herbs and weedy annuals increased. In these areas, inter-annual variation in precipitation also influenced total vegetation cover, species richness and diversity.[3]

These findings suggest that the effects of variations in grazing pressure and precipitation on Mongolian rangeland vegetation dynamics are complex and interactive. The evidence does give grounds for concern about increasing grazing pressure in the higher-rainfall steppe and mountain-steppe areas where domestic livestock populations tend to be higher. But the available evidence also casts in doubt two commonly held beliefs. First, that rising animal numbers or increasing concentration of grazing pressure necessarily lead to rangeland degradation in Mongolia. And, second, that where vegetation cover has been reduced through heavy grazing pressure, it represents an irreversible change in range condition.

Much has been made of a recent increase in livestock population since the onset of economic transition in the early 1990s. In fact, when expressed in standard stock units,[4] Mongolia's national herd is now smaller than it was in 1950.

Changes in Livestock Population
(expressed in stock units)

Year	*Total stock units* ('000)*
1918	3535.2
1924	4741.2
1930	6820.8
1950	8933.4
1961	7865.3
1970	7096.4
1980	7698.0
1985	7540.2
1992	8317.1
1996	9134.4
1999	10916.2
2001	7482.6

Note: *Stock units based on Mongolian bod or large stock (cow/horse) equivalent.

However, this does not imply that land degradation as a result of grazing pressure is not a problem. Rather, these data point to the fact that incipient pasture land degradation in Mongolia, under economic transition, is attributable to more complex institutional causes.

Wetlands

Wetlands are areas where water is the primary factor controlling the environment and associated plant and animal life. They occur where the water table is at or near the land surface, or where land is covered by shallow water. Wetlands are among the world's most productive environments. They are cradles of biological diversity, providing water and primary productivity for countless species of plants and animals. They tend to support high concentrations of birds, mammals, reptiles, amphibians, fish and invertebrate species. The interactions of the physical, biological and chemical components of a wetland

Mongolia's Ramsar Sites

Ayrag Nuur. *Khovd Province; 45,000 ha; 48°53'N 093°25'E. Proposed National Park.*
Ayrag Nuur is a shallow, freshwater lake in the Mongolian Great Lakes Basin. It is an exceptionally important breeding and resting site for a variety of waterbirds and the only remaining place in Mongolia where the Dalmatian Pelican regularly comes to breed. The lake is of fundamental importance for the groundwater recharge of the area. Other noteworthy waterbird species include the globally-threatened Swan Goose and Relict Gull. Land use around the wetland is limited to semi-nomadic animal husbandry.

Khar Us Nuur. *Khovd Province; 321,360 ha; 47°58'N 092°50'E.*
Khar Us Nuur National Park has three large but shallow lakes—Khar Us Nuur, Khar Nuur and Dorgon Nuur. Vast reedbeds and extensive aquatic plant communities provide a suitable habitat for a large number of breeding and migratory waterbirds, including the globally-threatened Swan Goose, Ferruginous Duck, White-headed Duck and Relict Gull. Three species of fish endemic to Western Mongolia occur in these lakes. The lakes are of fundamental importance for the groundwater recharge of the area, and are of social and cultural significance because of the presence of a number of sacred places and archeological sites. Current land use around the lakes is semi-nomadic animal husbandry.

Mongol Daguur. *Dornod Province; 210,000 ha; 49°42'N 115°06'E. International Protected Area; Strictly Protected Area; Nature Reserve; Crane Network Site.*
A transboundary protected area with Russia and China set in a basin formed by tectonic and volcanic activity, the site includes vast steppes, marshy wetlands, rivers and lakes. It supports a high species diversity with many rare plants. As many as 260 bird species use the site for staging, breeding or wintering, including six species of cranes of which two are threatened. Semi-nomadic animal husbandry is the principal livelihood of the local population. Crop production is also practiced.

Ogii Nuur. *Arkhangai Province, 2,510 ha; 47°46'N 102°46'E. Anatidae Network Site.*
Ogii Nuur is a freshwater lake located in the valley of the Orkhon River, comprising extensive alluvial areas of grassland, river channels, pools and marshes surrounded by grassy steppe. The maximum depth of the lake is 16m, but about 40 percent of the lake is less than 3m deep. The lake supports an intensive fishery and livestock grazing. It is a very important breeding and staging area for a wide variety of ducks, geese, and swans.

Terhiyn Tsagaan Nuur. *Arkhangai Province; 6,110 ha; 48°10'N 099°43'E. Natural Park; Anatidae Network Site.*
A freshwater and nutrient-poor lake formed by volcanic activity, Terhiyn Tsangaan Nuur is located in the Suman River valley in the Central Khangai Mountains. As with most wetlands in Mongolia, land use in and around the lake comprises of fishing and livestock grazing. The extensive marshes in the west are an important breeding and staging area for migratory waterfowl.

Valley of Lakes *(Boon Tsagaan Nuur, Taatsiin Tsagaan Nuur, Adgiin Tasgaan Nuur, Orog Nuur). Bayankhongor Province; 45,600 ha; 45°19'N 099°58'E.*
The Valley of Lakes consists of a chain of four saline lakes at the foot of the Gobi Altai, ranging from 1100m to 1235m in altitude. The lakes are shallow, with a saucer-shaped depth profile, and vary considerably in size both seasonally and from year to year. These lakes are known to be important staging areas for migratory waterfowl, and it has been suggested that they might be breeding areas for the rare Relict Gull. They provide grazing land for domestic livestock in an otherwise arid region.

Source: http://www.ramsar.org/profiles_mongolia.htm.

enable it to perform many vital functions. For example, wetlands are critical for water storage, storm protection and flood mitigation, groundwater recharge and discharge, water purification through retention of nutrients, sediments, and pollutants, and stabilization of local climate conditions, particularly rainfall and temperature.

Mongolia's wetlands, including marshlands, occupy 1.5 million ha, varying from the cold, deep and very low nutrient Lake Khovsgol to hosts of shallow and temporary salt lakes. There are 3500 freshwater and saline lakes, 3811 rivers and streams with a total length of 50,000 km, many with large floodplains, as well as 187 glaciers.

Mongolia joined the Ramsar Wetlands Convention in 1998. The Convention recognizes wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. On the basis of several criteria, six sites with a combined surface area of 630,580 ha, have been designated *wetlands of international importance.* Conservation or appropriate wise-use is to be promoted at these sites.

Mongolia's wetlands have been subject to only low levels of exploitation and thus remain relatively undisturbed. Low population density, especially around the lakes in the semi-arid region, and the fact that fish and waterfowl are not traditional food sources, are two main reasons. A history of wildfowl protection dating back to the 13th century, and Buddhist influence from the 16th century have reinforced this protection of the wetlands.

Even so, economic changes are creating new impacts on wetlands. Fishing is increasing to satisfy demand from China. Mining along the Tuul River is raising its concentrations of heavy metals (mainly mercury), and increasing its sediment loads twenty-fold. In some areas, notably Zaamar, the floodplains are literally being turned upside down to find gold. Even remote and large Lake Khovsgol suffers the occasional abuses of fuel trucks falling through the ice at the start and end of winter when they take a short cut across the ice, spilling their contents into the lake even if the practice has been outlawed.

It is clear that 1.5 million hectares of ecologically productive land should not go unmanaged. By joining the Ramsar Convention, GoM has already committed itself to protecting the most important wetlands. Impacts of economic activity on the other wetlands must be studied, so that these areas too are protected for future generations.

Forest Land

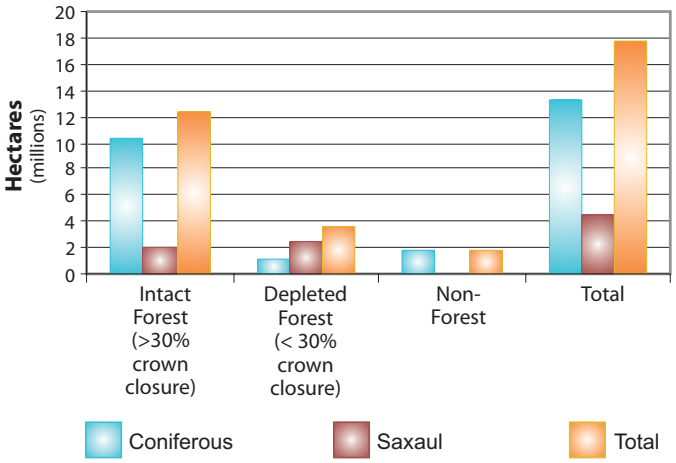
The 'forest territory' of Mongolia, as understood in the Mongolian Forest Law, occupies over 18.3 million ha, or 11 percent of its area.[5] Due to the complexity of forest distribution, the term includes land with dense, closed-canopy forest[6], sparse open-canopy forest, as well as land with no forest such as grasslands, shrublands, wetlands, agricultural areas and human settlements.

There are two major types of forests. Forests of mainly larch and pine, part of the vast Siberian Taiga, cover the north-central mountains between 800-2500 meters. Because they are at the southern edge of the Taiga, and are experiencing the impacts of both climate change and human activity on the edge of the grazing lands of the steppe, these forests are globally significant. The second forest type, comprising mainly saxaul, is found in the southwest deserts. These forests protect the land against erosion and desertification, and provide seasonal livestock fodder and fuelwood. All trees grow very slowly because of the extreme climate and low water availability.[7]

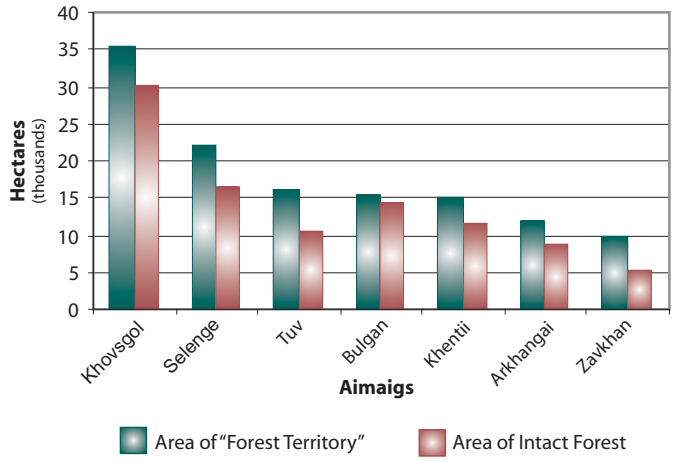
A long-term, cyclical drying of Mongolia's climate is causing a slow northerly retreat of its forests. However, much of the recent, rapid deforestation is primarily due to fire, improper commercial and illegal logging, inadequate enforcement of forest rules and regulations, grazing and browsing of young trees by livestock, and insect infestations.[8]

During the last century, Mongolia lost approximately four million ha of forests, averaging 40,000 ha annually. Between 1990 and 2000, due largely to unsustainable exploitation, the rate of deforestation increased to 60,000 ha per year. This was mostly from potentially commercial forests, with a standing volume of timber of 100-150 m^3 per ha. As a result of this ongoing loss and degradation, only 12.4 million ha of closed-canopy forests remain. Much of the remaining forests are fragmented and degraded. Loss and degradation of forests have serious and long-lasting impacts on groundwater recharge, local climate, biodiversity and the straightforward loss of valuable timber resources that could have been sustainably managed.

Forest Territory



Distribution of Coniferous Forest



Forest land and its resources are not well managed. Official records indicate that timber harvest levels have fallen considerably since 1990—from an average of about 1.8 million m^3 per year during the 1980s to about 620,000 m^3 in 2002. Given the grossly unsustainable nature of the harvest before 1980, this is not a bad thing. The planned 2002 legal timber harvest included 40,000 m^3 of round wood and 580,000 m^3 of fuelwood. It should be understood, however, that while estimates vary considerably, the legal timber harvest comprises only a small portion of the totals actually harvested. Current estimates of actual 2002 domestic sawn wood consumption range between 340,000 and one million m^3, and annual

domestic fuelwood consumption is subject to an even greater range of estimates – between 625,000 and two million m^3. Thus in total, the current annual timber harvest is estimated to fall somewhere between 965,000 to three million m^3. This suggests a total illegal wood harvest, for which the Government receives no royalties or taxes, in the range of 345,000 to 2.38 million m^3 per year or between 36 and 80 percent of total harvest. This degree of mismanagement is unsustainable and if forests are not better managed, there will undoubtedly be further deteriorations of the land, water and climate.

The present area zoned as 'utilization forest' is clearly inadequate to support a viable domestic wood-based industry or to attract the capital it needs to modernize for greater efficiency. The management of forest land through top-down enforcement of regulations has been ineffective, and a two-prong strategy involving gradual expansion of community forest management and strengthening of the existing government enforcement regime offers the best alternative to minimize illegal harvesting.

About 65 percent of the total wood harvested is used by poor rural and urban households for both cooking and residential heating. This wood is a source of energy for which no realistic alternative exists at a time of serious, accelerating forest depletion. It is estimated that if no alternative sources of domestic fuel are developed and current levels of forest depletion continue unabated, serious fuelwood shortages will begin to be experienced in urban areas by the end of this decade and Mongolia will suffer substantial losses of biodiversity and important forest resources.

In the decades prior to and since 1990, GoM has sought to establish programs of tree replanting both as a means of creating employment and also to restore forest areas. None of these programs have been particularly successful and the area successfully replanted represents only five percent of the total forest lost. At present, 150,000 hectares of forest need to be restored or allowed to regenerate; however, only 5,000 hectares are being restored annually.

Because of poor handling of the seedlings, inadequately-prepared ground, lack of the necessary fungal associations with the roots, and especially the difficulty of protecting the seedlings from the depredations of livestock, replanting has not yielded extensive young forests. As a result, considerable sums of money have been wasted. Mongolia is far from being alone in experiencing difficulties in directly growing forest and yet there is institutional resistance to the alternative of relying on natural regeneration as the force for forest regrowth. The essential protection from livestock requires communities to have a significant degree of involvement. It is these poor rural communities whose livelihood is likely to suffer the most if lands become more degraded.

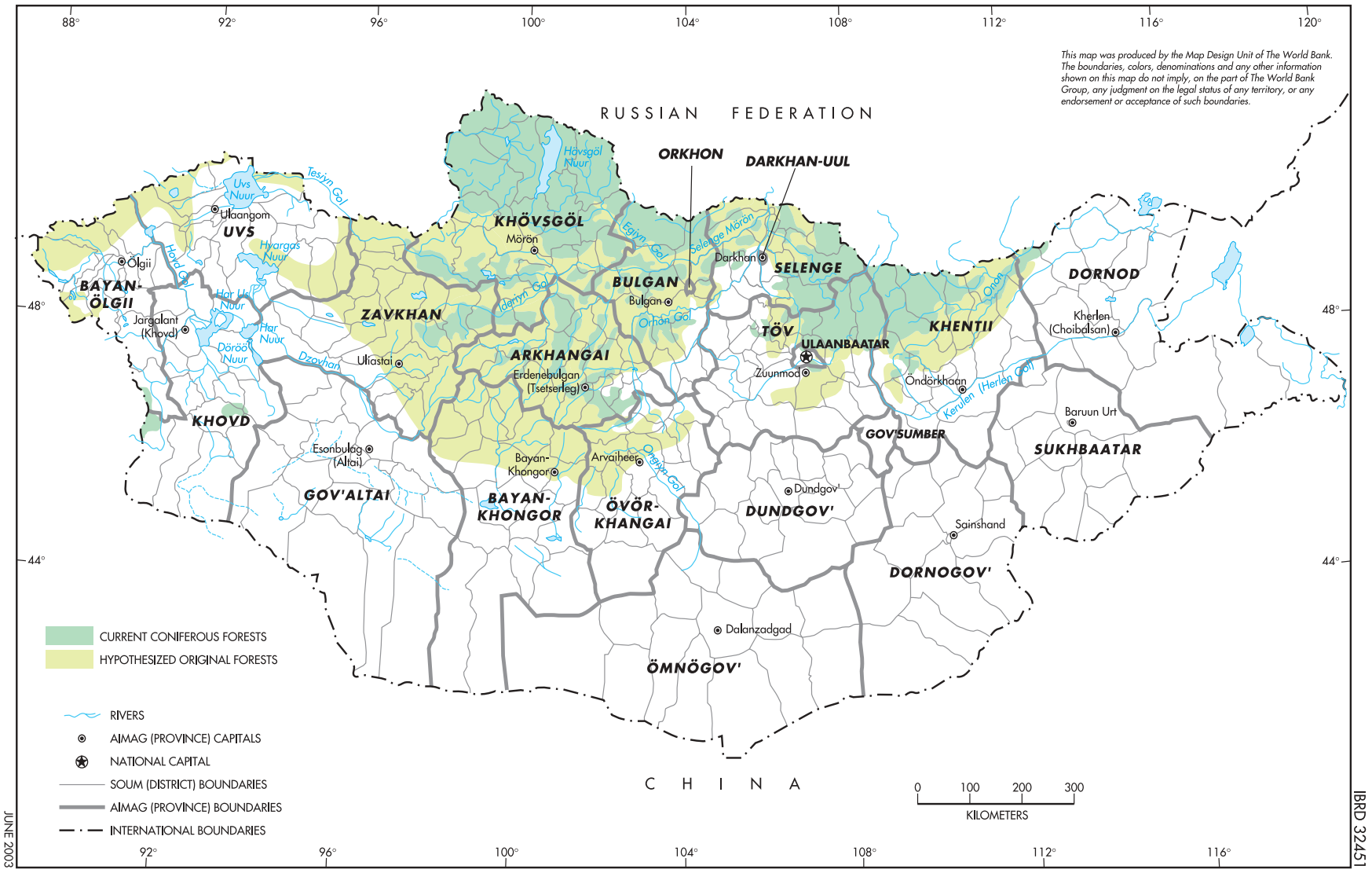
PERMAFROST

Mongolia lies on a high continental plateau, and has a climate that is conducive to the formation of permafrost or frozen ground. More than 60 percent of the country experiences some variety of permafrost, depending on the local climate, altitude, exposure to sun and plant cover. Forested areas and north-facing slopes that receive less sun are most likely to be underlain with permafrost.

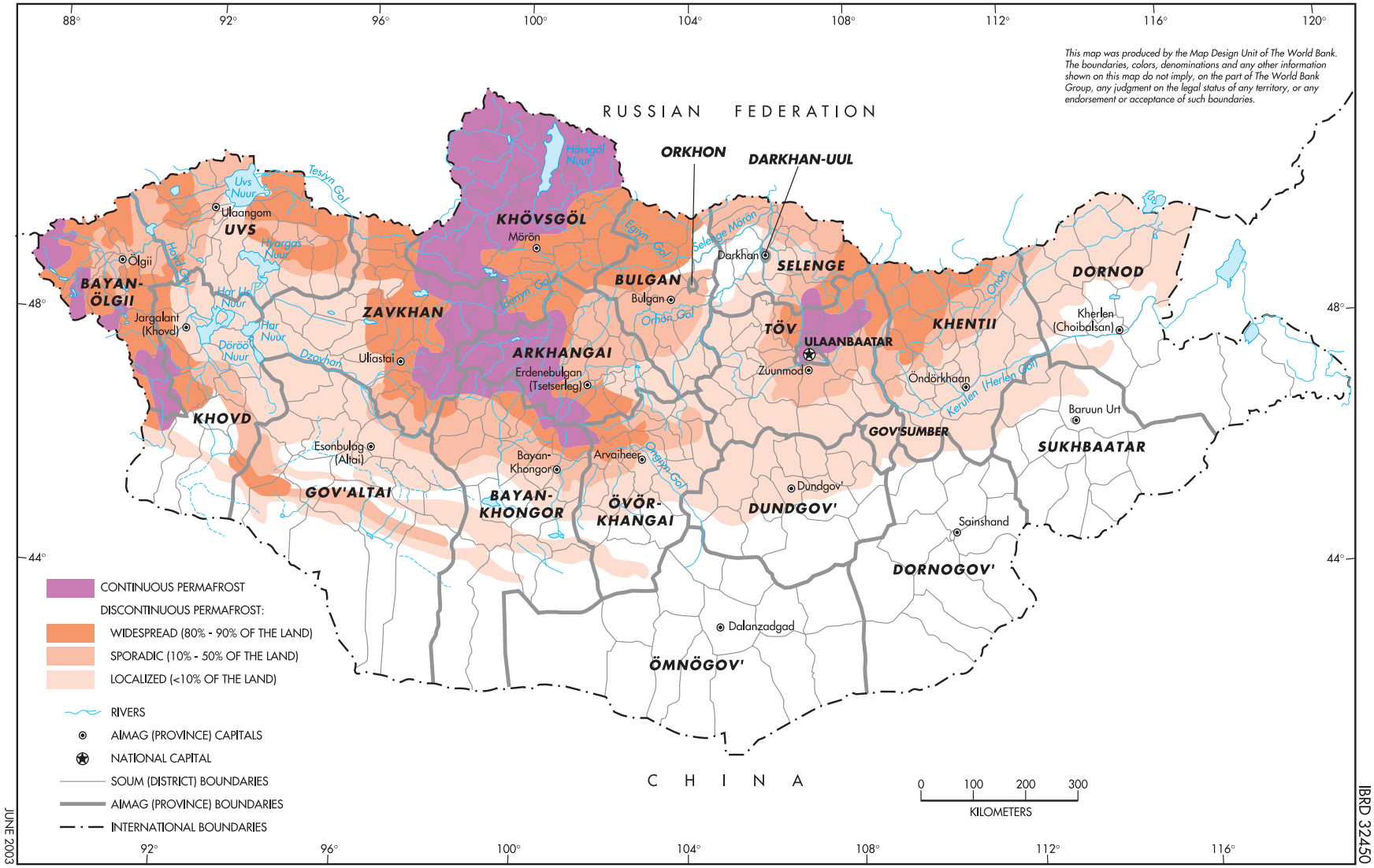
Permafrost extends from the northern border of Khovsgol aimag into the Khangai Mountains, and as far south as Ulaanbaatar and the Altai Mountains. Although the surface layer, known as the "active zone", warms during the winter months, soils and rocks that are one to three meters below the top layer remain frozen. Depending on the location, the temperature of permafrost in Mongolia is from -0.5 to -30 degrees centigrade. The permafrost can be 10 to 20 m thick in southern areas, to well over 100 to 200 m thick in the north, particularly in the mountains.

Forest cutting and heavy pastoral use that lead to the loss of ground vegetation cover, in the presence of climate change, are causing a warming of the ground and melting of the permafrost. This loss of permafrost has several impacts. Soil can become unstable, leading to a downward movement of soil on hill slopes. Melting of permafrost increases the drying of soil, resulting in reduced growth of plants for grazing animals. Permafrost soils have high organic content and warming increases the rate at which organic matter breaks down, increasing the release of carbon dioxide and methane, both green house gases, into the air. Finally, buildings erected on permafrost ground without proper support, have collapsed in Khatgal, and road surfaces have become very unstable and almost impassable.

Source: C. Goulden, Academy of Natural Sciences, Philadelphia.



Source: Map of original forest cover adapted from World Resources Institute (WRI). 1997. *The Last Frontier Forests: Ecosystems and Economies on the Edge*. Washington, DC: WRI.


88°
92°
96°
100°
104°
108°
112°
116°
120°
48°
44°
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
RUSSIAN FEDERATION
CHINA
ORKHON
DARKHAN-UUL
KHÖVSGÖL
UVS
BAYAN-ÖLGII
ZAVKHAN
BULGAN
SELENGE
TÖV
ULAANBAATAR
DORNOD
KHENTII
ARKHANGAI
KHOVD
GOV'ALTAI
BAYAN-KHONGOR
ÖVÖR-KHANGAI
DUNDGOV'
DORNOGOV'
GOV'SUMBER
SUKHBAATAR
ÖMNÖGOV'
Ulaangom
Ölgii
Jargalant (Khovd)
Mörön
Darkhan
Bulgan
Uliastai
Erdenebulgan (Tsetserleg)
Zuunmod
Öndörkhaan
Kherlen (Choibalsan)
Baruun Urt
Esonbulag (Altai)
Bayan-Khongor
Arvaiheer
Dundgov'
Sainshand
Dalanzadgad
Uvs Nuur
Hövsgöl Nuur
Hyargas Nuur
Har Us Nuur
Har Nuur
Döröö Nuur
Tesiyn Gol
Egiyn Gol
Selenge Mörön
Orkhon Gol
Idamyn Gol
Dzavhan
Onon
Kerulen (Herlen Gol)
Orgiya Gol
CONTINUOUS PERMAFROST
DISCONTINUOUS PERMAFROST:
WIDESPREAD (80% - 90% OF THE LAND)
SPORADIC (10% - 50% OF THE LAND)
LOCALIZED (<10% OF THE LAND)
RIVERS
AIMAG (PROVINCE) CAPITALS
NATIONAL CAPITAL
SOUM (DISTRICT) BOUNDARIES
AIMAG (PROVINCE) BOUNDARIES
INTERNATIONAL BOUNDARIES
0 100 200 300
KILOMETERS
JUNE 2003
IBRD 32450

Biodiversity

Two of the world's most biologically outstanding 'ecoregions' - the Daurian Steppes and the Altai-Sayan Mountains are in Mongolia.[9] Coniferous forests and extensive alpine landscapes form a biogeographic divide between Siberia and the desert basins of Central Asia, and are centers of plant and animal biodiversity.

The relatively high biodiversity is a result of the combination of flora and fauna from Northern and Inner Asia. Mongolia is home to more than 2,823 species of plants (compared to 2,400 in central Siberia, and 2,176 in Inner Mongolia[10]). It also provides habitat for wildlife now extinct or rare elsewhere, such as the snow leopard, Przewalski's horse, wild donkey, wild sheep, ibex, Gobi bear, Bactrian camel, and Saiga antelope.

Many plants and animals are used both for local purposes and export. Plants have medicinal uses (e.g rhodiola, valerian, and scholar tree) and fuelwood uses (e.g. saxaul, salttree, and tamarisk). Animals are hunted for wild meat as well as for their fur (e.g. sable, fox, lynx and marmot). Deer antlers are sought for their use in traditional Chinese medicine.

Nesting kites.

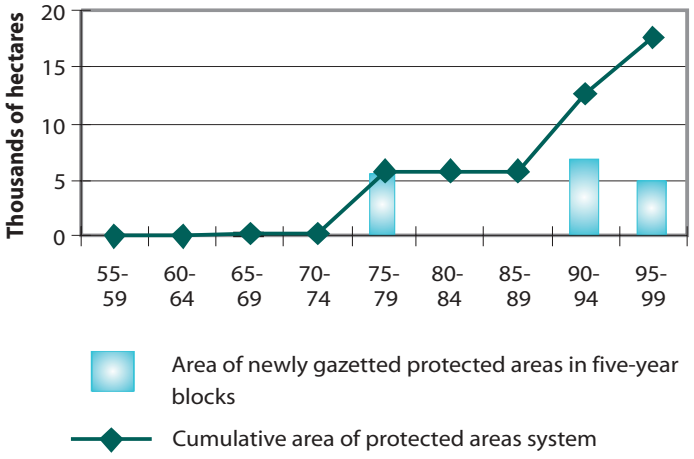
The Government recognizes that the country's biodiversity is a significant economic resource and a source of spiritual enjoyment for Mongolians and others. Throughout history, it has protected lands and species that have been deemed special to the people of Mongolia. The Bogd Khan Mountain, just south of Ulaanbaatar, was declared a nature reserve in 1778. The Government has designated 48 protected areas around the country, covering over 20 million ha - 13 percent of the country. In addition, local governments have declared 115 protected areas, covering one million ha.

Over 10 million ha around the Special Protected Areas and National Parks have been designated as *buffer zones*. The area of land enjoying a degree of institutionalized protection in Mongolia is about the entire size of Britain. Although, the percentage of land currently under protection exceeds international norms, GoM intends to increase its protected area network to up to 30 percent of the country's territory. Within these areas, some degree of regulated multiple uses are allowed in the zones identified as *limited used zones* by the Law on Special Protected Areas. These uses include traditional husbandry, road construction and construction of tourism infrastructure. Hunting, logging, and other construction are not permitted.

Despite steps taken by government, biodiversity is facing significant threats from a multitude of sources, changing the look and dynamics of the land. Overuse and over-collection of plant and animal species are the main threats and many areas are reported to be 'empty' of wildlife. Steppe and forest fires kill wildlife and reduce the area of habitat available. Climate change is also increasingly seen as a source of concern since it affects soil temperatures and moisture, vegetation, and consequently the distribution of species.

Inappropriate and poorly-enforced hunting quotas and environmental laws, failure to protect areas from multiple tracks of tourist transport, and inadequately resourced environmental inspectors in the *aimags* and *soums*[11] are examples of failures to effectively implement existing policies. In such a policy environment it is unclear that simply increasing the amount of land under special protection will lead to better biodiversity protection or ecological land management.

Protected Areas System



BRANDT'S VOLE

One of the most contentious land management issues is the role of the small Brandt's Vole whose global distribution lies almost entirely within an ever-broadening band across the middle of Mongolia. Brandt's voles are considered by many to be pests and have been poisoned using aerial spraying for some 40 years. Dense concentrations of Brandt's voles can consume 40 percent of the total vegetation in an area. Heavy grazing improves the pasture for voles, which prefer medium and short grasses to tall ones, and intermediate to thicker cover. The voles in turn reduce the amount of grazing available for livestock.

Poisoning Brandt's voles raises the risk of poisoning many non-target species, including vole predators, which also live on the steppe. It is increasingly recognized that herders need to manage the steppe quality themselves to produce pasture habitat which is unfavorable to voles and productive for livestock. Releasing pressure on the pastures, and encouraging predators by providing perches/nest sites are two means of achieving this outcome.

Source: Adapted from Laurie A. 2000. "Brandt's Vole outbreaks and control in China—An ecological approach." GEF-UNDP Eastern Steppe Biodiversity Project, Choibalsan.

Land Degradation

In general, land degradation refers to *a change in land quality, most often as a result of human activities, undermining its capacity to sustain current uses*. Estimates vary as to the extent and degree of land degradation; reflecting differences in definitions of land degradation used by agencies. However, since many of these definitions themselves are not readily available, one should be skeptical about the accuracy of the estimates.[12]

The Mongolian Land Administration Authority estimates that 11 million ha of pasture land or nine percent of total pasture land area, is 'degraded to some extent'. The National Environmental Action Plan 2000 (NEAP 2000) suggests that seven percent of all pasture land has become'heavily degraded.' The Mongolian Action Plan for the 21st Century (MAP-21) estimates that between five to nine percent of the total pasture land had become'severely degraded' and 30 percent had been 'damaged' by 1998. It also estimates that 78 percent of the total land area is'damaged or depleted.'

Some 41 percent of Mongolia's land area is known as Gobi, a term that refers specifically to stony desert with very sparse, shrub vegetation. Low primary productivity in this area is independent of human use. However, inclusion of Gobi land may account for the high land degradation estimate cited in MAP-21. The extent of Mongolian territory covered by sand (including dunes) appears to have been remarkably stable over the last 40 years, having increased by just 0.02 percent. If 'desertification' is understood in this narrow sense, the area said to be desertified in Mongolia is very limited indeed.

Dust storms of fine sand particles are a phenomenon experienced each spring but the frequency and intensity with which they occur have been on the rise. In March 2002, a major storm affected Mongolia, 18 provinces of China, Japan and Korea, and was detected even in western United States and Canada. Sand storms are caused by strong northwesterly winds from March to May, updrafts created by high ground temperatures, and the presence of loose fine sand.

The soil surface in arid regions supports microbial communities termed cryptobiotic crusts. These form an inconspicuous gray-brown matrix on the sand, consisting of fungi, cyanobacteria, mosses, bacteria, green algae and lichens. If the soil remains undisturbed, the cryptobiotic crust covers much of the spaces between vascular plants and helps to retain moisture in the upper layer of soil, thus diminishing erosion, and providing nutrients for plants. The impact of livestock on the crust varies: the soft feet of camels are innocuous, but the sharp hooves of goats are very damaging. Once the crust is broken it is very easy for the wind to erode away sand at the exposed edges.

Sand storms are, to a degree, entirely natural in origin. However, they are becoming a human-induced natural disaster. Global warming is believed to be drying the already dry areas of northeast Asia, creating conditions more conducive to desertification. In addition, overgrazing, loss of saxaul tree cover in the Gobi, breaking of the soil surface through ploughing, mining, and sharp animal hooves have also contributed to worsening sand storms. Such severe storms have major economic impacts on health, livestock, buildings, transport and tourism. Conversely, they can increase the primary production of the seas east of Mongolia, the sand can neutralize the local effects of acid rain, and it has a cooling effect on the climate.

While not the only factor, improved land management is crucial to reducing the number of sand storms and their impacts. This

Sand dunes in the Gobi desert.

MONGOLIA AND THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION

The United Nations (UN) recognizes desertification as a leading cause of poverty and hunger, and has developed a Convention to Combat Desertification (UNCCD). Like many other countries affected by desertification problems, Mongolia signed UNCCD in 1994, and its parliament ratified the Convention in 1996.

As part of the Convention, signatories are required to draft a National Plan of Action to Combat Desertification (NPACD). In Mongolia, NPACD has also been used as a basis for obtaining external assistance and mobilizing internal support. The Ministry of Nature and Environment (MNE) implements both the Convention and the Action Plan through its National Committee to Combat Desertification.

There are three phases of NPACD implementation: first, creating the legal environment to strengthen working relations and policy coordination between central and local governments; second, creating desertification monitoring capacity, identifying areas that are being severely degraded, and putting into place policies that would reverse the desertification process; and finally, completing all the required activities, and strengthening national capacity to combat future desertification. Efforts to combat desertification are present in over 20 programs and action plans, including Ecological Concept, Mongolian Action Program for the 21st Century, National Water Program, National Program on Forestry, National Program on Natural Disaster Reduction and the Government Action Program 2000-2004.

Two international seminars, conducted in cooperation with the Secretariat of the Convention to Combat Desertification, and a series of national seminars have been held at the national and local level. As a result, public awareness of issues pertaining to desertification is increasing, especially among communities. Between 1995 and 1998, the Government signed seven inter-governmental and over 20 inter-ministerial agreements with neighboring and other countries, to protect the environment. Many of these agreements contains provisions to cooperate in combating desertification. Since 1990, 14 projects with total costs of US$ 24.6 million, are being implemented with the assistance of the international donor community.

In June 2003, GOM approved the new National Action Plan and Program to combat desertification for the period 2003–07, covering practical measures, studies of impacts, adaptation, capacity building and cooperation.

Source: Adapted from *Mongolia: State of the Environment 2002*, United Nations Environment Programme and Ministry of Nature and Environment, Mongolia.

relationship has been recognized in the 1997 National Action Plan to Combat Desertification and confirmed in the new 2003 version. This Plan stresses the importance of preventive measures and sustainable rangeland management, especially close to oases, and the stabilization of sandy soils near the Chinese border through reduced grazing and control of commercial collection of fuelwood and medicinal plants, capacity building, and study of impacts.

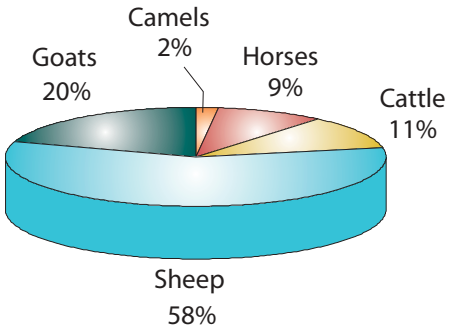
In the economic transition of the 1990s, decollectivization and privatization left many people unemployed. Large numbers turned to livestock production as a means of supporting their families. The total number of herding households doubled from 75,000 in 1990 to 185,500 in 2001.[13] Differences between new and existing herders in terms of their livelihood orientation, and levels of wealth, skill and experience in herding, have had profound implications for pastureland management.

As a result of a dramatic increase in the livestock herd from 1993 to 1998, and an equally remarkable decline from 1999 to 2001, total livestock numbers remained more or less constant over the period 1990–2001. The main reason for the substantial increase in livestock numbers through the 1990s was the breakdown of the centralized marketing system that had prevailed under collectivized agriculture. Guaranteed markets for meat and other livestock products had curtailed national herd growth through high rates of annual off-take each autumn. This also ensured that fewer animals needed to be carried and fed over the harsh winter/spring period.

The breakdown of this system in the early 1990s, and the parallel collapse of the state-subsidized distribution of consumer goods through wholesale agents, resulted in sharply deteriorating terms of trade for herding households. Herders preferred to keep animals 'on the hoof' rather than sell them for low prices relative to the cost of consumer goods. In the inflationary economic environment of the early to mid-1990s, increasing the size of household herds became herders' chief objective.

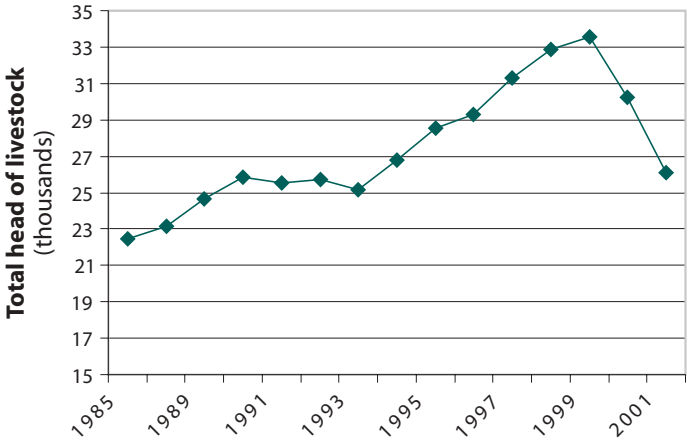
The early 1990s saw a steady net flow of urban-to-rural migrants, swelling the populations of most rural districts, particularly in central and western Mongolia. This trend could be attributed to the many newly unemployed state workers who acquired a few animals under the privatization of state and collective assets, and took up life as herders in the countryside. Notable exceptions to this trend were Kazakh-dominated Bayan-Ölgii *aimag* in the far West, which saw an outflow of migrant workers to Kazakhstan in the early 1990s under labor contracts arranged through the Ministries of Labor

Herd Composition by Species, 1990



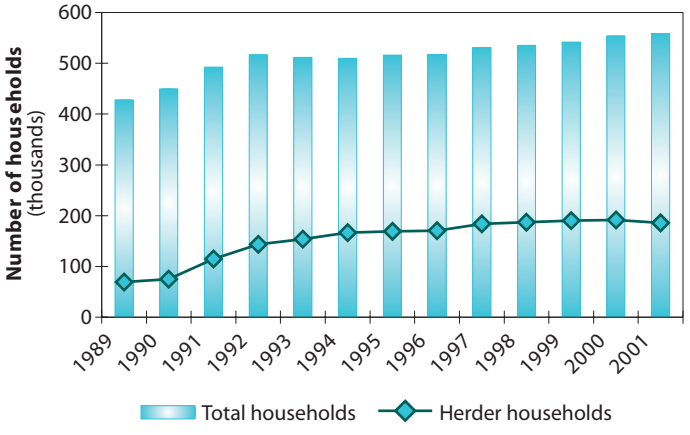
Source: Authors.

Total Livestock, 1985–2001



Source: Authors.

Herder Households as Share of Total, 1989–2001



Source: Authors.

of the two countries; and some very remote areas such as parts of Dornod *aimag* in the far East, Khövsgöl *aimag* in the North. Also other areas closer to urban centers – such as in Khentii (close to Ulaanbaatar), Selenge (close to Darkhan and Erdenet), and the newly created Gov'sumber *aimags* – also experienced declining populations.

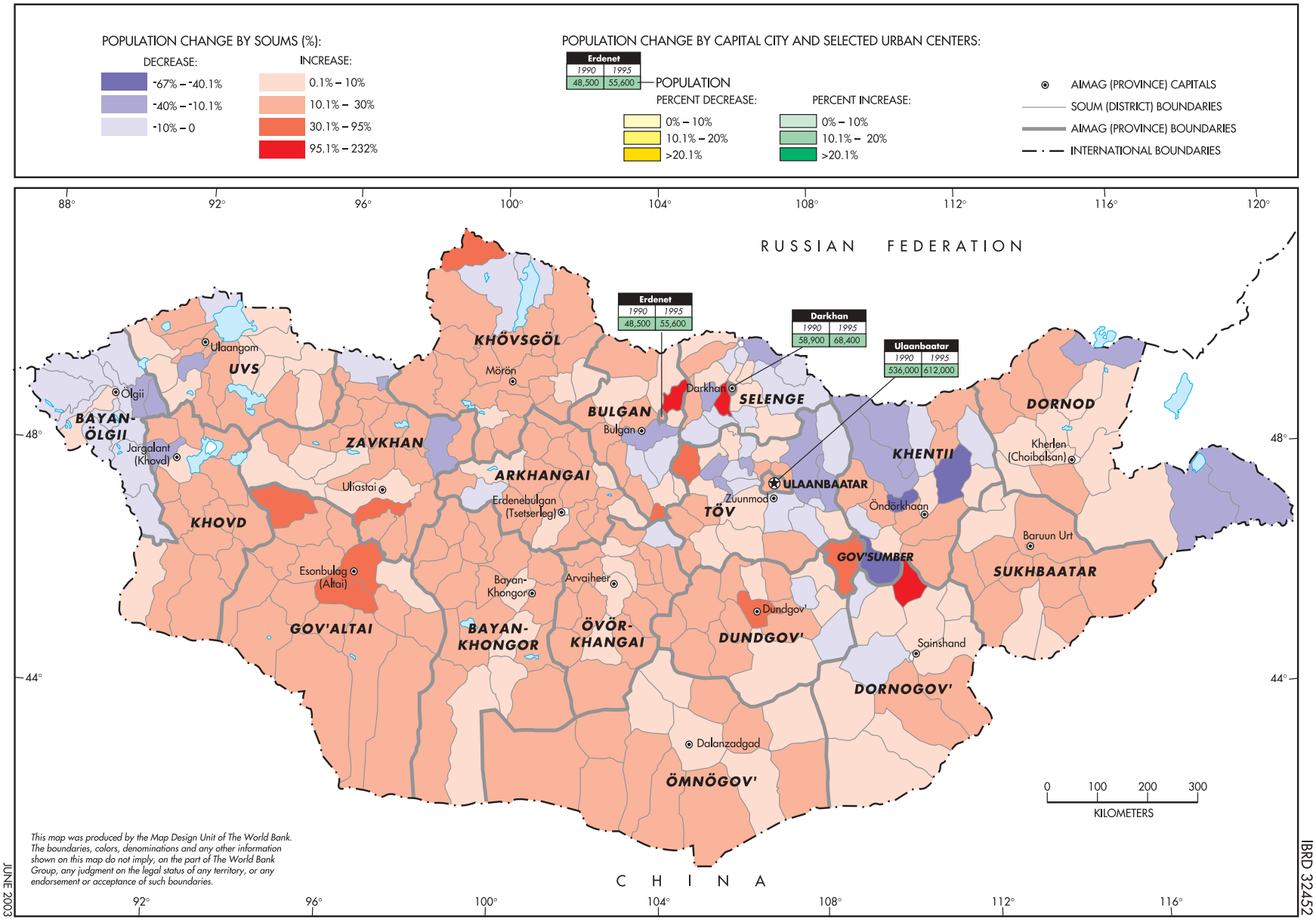
By the second half of the 1990s this pattern had more or less reversed. Herders, and other rural inhabitants, began to migrate toward markets so as to reduce transaction costs and improve their household terms of trade. This process of population concentration began taking place at virtually all scale levels: within districts (from outlying areas to those closer to district centers), within provinces (closer to provincial centers and major transport axes), and on a national scale (from more remote provinces, particularly in western Mongolia, towards those in central Mongolia closer to Ulaanbaatar).

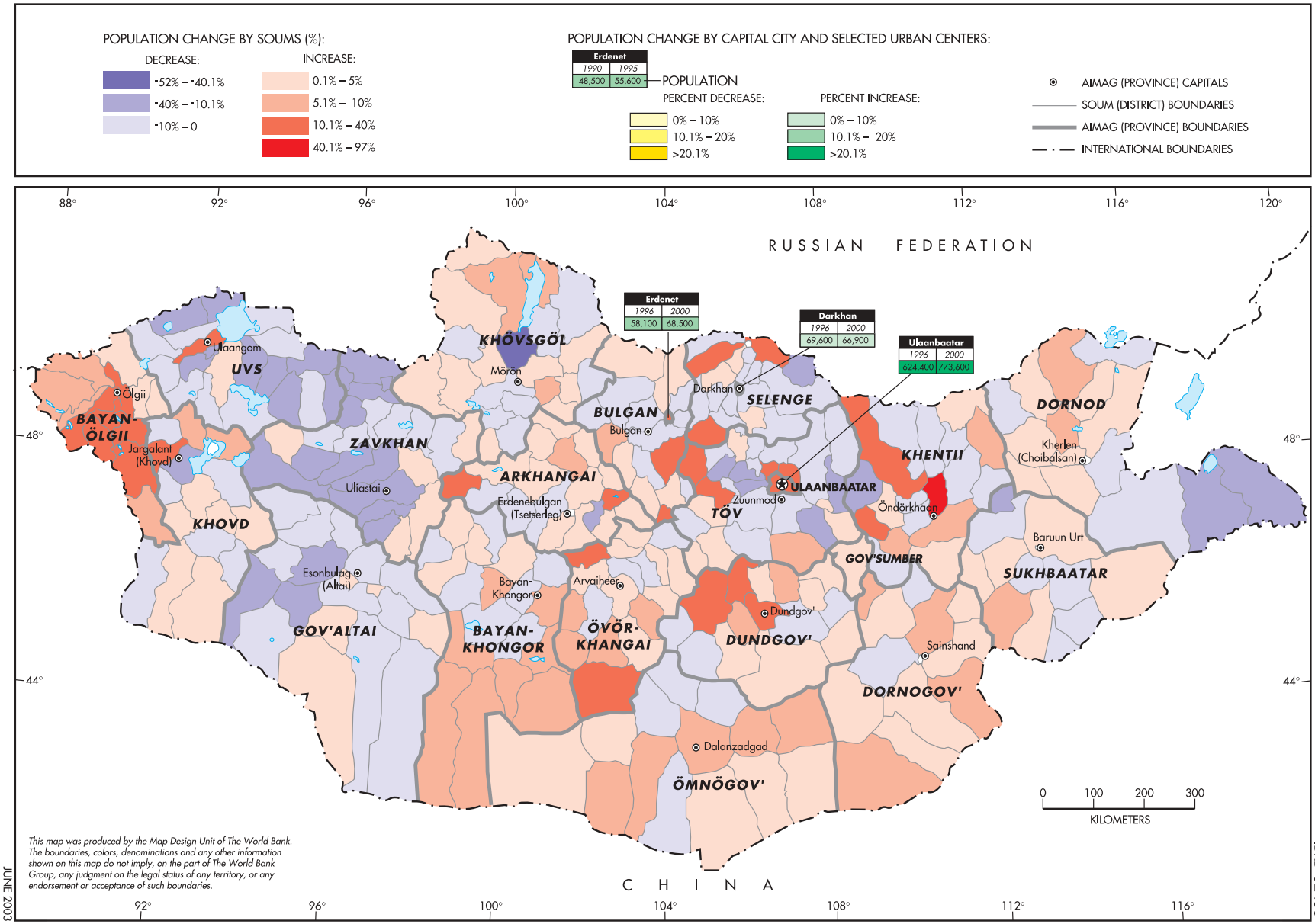
Most rural districts saw a net outflow of people. This was particularly marked from more remote areas of western Mongolia (Uvs, Zavkhan, and Gov'Altai *aimags*). Again, there were notable exceptions to this broad trend. Bayan-Ölgii's rural population increased significantly, with the return of many migrant workers who preferred life in transitional Mongolia to that in transitional Kazakhstan. And Dornod's remote eastern steppes continued to be depopulated. Overall, however, the process of rural-to-urban migration—particularly to Ulaanbaatar—became a major concern for the national government. In response, in 2000, GoM announced a'regional development' policy that aimed to bring about a more even spatial pattern of economic opportunity throughout Mongolia.

The species composition of the national herd also changed as a result of economic changes in the 1990s. Most notably, goats have increased as a share of total livestock from 20 percent in 1990 to 37 percent in 2001, as a direct response to higher, if fluctuating, world cashmere prices. This increase has come primarily at the expense of sheep, which declined in relative terms from 58 percent of the national herd to 46 percent over the same period. The shift has affected areas not previously associated with cashmere production such as those in northern Mongolia. In a recent, participatory assessment of changing living standards in the 1990s, the only rural communities in which most people felt better off were those best placed to take advantage of cashmere trading opportunities along the Chinese border.[14]

This marked shift in herd composition between sheep and goats has important implications for risk management in

Nomadic herders and their animals camp on the outskirts of the Gobi.


POPULATION CHANGE BY SOUMS (%):
DECREASE:
-67% – -40.1%
-40% – -10.1%
-10% – 0
INCREASE:
0.1% – 10%
10.1% – 30%
30.1% – 95%
95.1% – 232%
POPULATION CHANGE BY CAPITAL CITY AND SELECTED URBAN CENTERS:
Erdenet
1990 1995
48,500 55,600
POPULATION
PERCENT DECREASE:
0% – 10%
10.1% – 20%
>20.1%
PERCENT INCREASE:
0% – 10%
10.1% – 20%
>20.1%
AIMAG (PROVINCE) CAPITALS
SOUM (DISTRICT) BOUNDARIES
AIMAG (PROVINCE) BOUNDARIES
INTERNATIONAL BOUNDARIES
88° 92° 96° 100° 104° 108° 112° 116° 120°
RUSSIAN FEDERATION
Erdenet
1990 1995
48,500 55,600
Darkhan
1990 1995
58,900 68,400
Ulaanbaatar
1990 1995
536,000 612,000
KHÖVSGÖL
Mörön
UVS
Ulaangom
Ölgii
BAYAN-ÖLGII
Jargalant (Khovd)
ZAVKHAN
BULGAN
Bulgan
Darkhan
SELENGE
DORNOD
Kherlen (Choibalsan)
KHENTII
ARKHANGAI
Uliastai
Erdenebulgan (Tsetserleg)
ULAANBAATAR
Zuunmod
TÖV
Öndörkhaan
KHOVD
Baruun Urt
GOV'SUMBER
SUKHBAATAR
Esonbulag (Altai)
Bayan-Khongor
Arvaiheer
Dundgov'
GOV'ALTAI
BAYAN-KHONGOR
ÖVÖR-KHANGAI
DUNDGOV'
Sainshand
DORNOGOV'
Dalanzadgad
ÖMNÖGOV'
48°
44°
0 100 200 300
KILOMETERS
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
C H I N A
92° 96° 100° 104° 108° 112° 116°
JUNE 2003
IBRD 32452


POPULATION CHANGE BY SOUMS (%):
DECREASE:
-52% – -40.1%
-40% – -10.1%
-10% – 0
INCREASE:
0.1% – 5%
5.1% – 10%
10.1% – 40%
40.1% – 97%
POPULATION CHANGE BY CAPITAL CITY AND SELECTED URBAN CENTERS:
Erdenet
1990 1995
48,500 55,600
POPULATION
PERCENT DECREASE:
0% – 10%
10.1% – 20%
>20.1%
PERCENT INCREASE:
0% – 10%
10.1% – 20%
>20.1%
AIMAG (PROVINCE) CAPITALS
SOUM (DISTRICT) BOUNDARIES
AIMAG (PROVINCE) BOUNDARIES
INTERNATIONAL BOUNDARIES
88° 92° 96° 100° 104° 108° 112° 116° 120°
RUSSIAN FEDERATION
Erdenet
1996 2000
58,100 68,500
Darkhan
1996 2000
69,600 66,900
Ulaanbaatar
1996 2000
624,400 773,600
BAYAN-ÖLGII
UVS
KHÖVSGÖL
ZAVKHAN
BULGAN
SELENGE
DORNOD
KHENTII
ARKHANGAI
ULAANBAATAR
TÖV
KHOVD
GOV'SUMBER
SUKHBAATAR
GOV'ALTAI
BAYAN-KHONGOR
ÖVÖR-KHANGAI
DUNDGOV'
DORNOGOV'
ÖMNÖGOV'
Ulaangom
Ölgii
Jargalant (Khovd)
Mörön
Darkhan
Bulgan
Kherlen (Choibalsan)
Uliastai
Erdenebulgan (Tsetserleg)
Züunmod
Öndörkhaan
Baruun Urt
Esonbulag (Altai)
Bayan-Khongor
Arvaiheer
Dundgov'
Sainshand
Dalanzadgad
48°
44°
0 100 200 300
KILOMETERS
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
JUNE 2003
C H I N A
92° 96° 100° 104° 108° 112° 116°
IBRD 32453

livestock production, since goats tend to be more susceptible to the effects of cold and nutritional stress than sheep. The implications for pasture land management are less clear. The fact that goats are less selective than sheep in their foraging strategies is often thought to have more damaging consequences for vegetation cover, species richness, and diversity

The relative shares of cattle and horses in the overall national herd remained constant between 1990 and 2000, at 11 percent and nine percent respectively. However, losses of these large stocks during the three consecutive dzud[15] were more significant in relative terms than those of small ruminants.

While household herds generally increased in size throughout much of the 1990s, the distribution of livestock holdings among herding households became progressively more unequal. This growth in inequality was consistent with the widening gap between rich and poor in society more generally. In 1990, two-thirds of all herding households had private herds of not more than 30 head of animals. By 2000, the same proportion of households had herds of around 150 animals. For most herders, this increase in herd size barely kept pace with the rising cost of living. A small proportion of rich herders saw their herds increase very substantially by the late 1990s. This trend of concentration in livestock holdings declined somewhat after 1999, owing to dzud losses that hit larger herders hard in absolute terms (although much less severely than poor herders, relative to their total livestock holdings).

In comparison with existing herders, 'newcomers' to herding in the early to mid-1990s were less skilled and experienced in livestock production. Their herds were generally smaller and less likely to increase over time. New herders were more inclined to sell or slaughter animals to meet livelihood needs. They also tended to move less frequently than more experienced ones, and to remain closer to settlements, roads, and other points of market access.

There is also evidence that richer herders tended to move less frequently by the late 1990s. In their case, the motivation was often to 'capture' the best winter/spring camp sites, and to maintain a year-round base at these camps in order to guard the pastures they claimed against out-of-season trespass by others. The allocation of 'possession contracts' (a form of tenure not unlike long-term leases) over winter camps in many areas during the late 1990s, gave formal, legal backing to customary land claims under the 1994 Land Law, and reinforced the tendency for better-off herders to remain more sedentary throughout the year.

These socially differentiated patterns of livestock ownership and production strategies have important implications for pasture land management. Rising human (herder) and livestock populations in general, and their growing concentration in particular, clearly place greater pressure on limited grazing resources. While the underlying range ecology is complex, and drier areas are probably more resilient than it is often assumed, there is little doubt that there are serious constraints on available pasture land in the more accessible steppe regions of the country. Herding has also led to severe congestion in many forest/mountain steppe areas where topography is a limiting factor. The increasing heterogeneity of herding communities—owing to differences in household herd sizes, levels of experience in herding, and between local herders and in-migrants from other areas—poses more difficult challenges of coordination of pasture land use among herders.[16]

In the past, the herding community at rural sub-district level may have decided, in a quarterly public meeting, to set aside certain areas of their territory for use during particular seasons. But against a background of declining trust among community members, and inconsistencies in the land law regarding the possibilities of denying non-community members access to local pasture, there are few mechanisms for ensuring that these agreements 'stick'. It is becoming harder to impose effective sanctions on 'free-riders' since they may be newcomers who were not party to those agreements. These and other factors have led to rising levels of conflict over pasture land and camp sites in many areas.

Community-based Pasture land Management

Between August 2000 and February 2002, a small project supported by a local NGO and the United Nations Development Programme (UNDP) tested an innovative approach to pastureland management by customary herding communities. Three project sites, exhibiting varying degrees of population pressure and market access, were selected in different ecological zones.

The project concept rested on the following hypothesis: herders are more likely to cooperate in pastureland management when they also have an interest in working together on other activities that have a more immediate bearing on their livelihoods. Such activities include veterinary service provision, livestock breeding, preparing or purchasing supplementary fodder, and livestock product marketing and processing.

Guided by this hypothesis, the project provided external support available in several mutually-supporting areas. It provided institutional strengthening of existing herder groups of 20 households or more, based on customary residence and seasonal migration patterns. Herder groups were offered training in business and organizational skills. The project also created revolving funds to assist with the purchase of essential veterinary medicines and supplementary animal feed, and to access high-quality breeding animals. In addition, local governments provided services to link herder groups. Group pastureland 'possession contracts' were also promoted, under the existing Land Law, as a means of fostering more conservation-oriented and socially-inclusive pastureland use practices.

External support by UNDP and the Government of New Zealand, was withdrawn only in February 2002. While it is still too early to judge the long-term impact of this pilot, a promising start has been made. There are plans to replicate and scale-up the pilot under new programs supported by the World Bank, Asian Development Bank, and the Government of the Netherlands. Future sustainability will depend on devising a model that will work without external subsidy. Similar work is also being financed by IDRC and GTZ.

Source: CPR. 2002. "Support to Implementing Mongolian Action Plan-21: Strengthening Customary Herding Communities." Final Report to UNDP. Ulaanbaatar: Center for Policy Research.

Dzud and Pastoral Risk Management

Dzud is the collective term for a range of winter weather-related conditions that prevent domestic animals from foraging in open grazing. Dzud is a fact of life for Mongolian herders, who have developed strategies for coping with and adapting to their harsh environment. Heavy accumulations of snow or ice crusts covering pastures are the most common form of dzud (white dzud). In situations where this precipitation is the primary source of drinking water for livestock, the absence of snow or ice at winter pastures is also a type of dzud (black dzud). Since forage production on natural pastures is almost entirely dependent on rainfall during the short summer growing period, dzud conditions are exacerbated by drought in the preceding summer, so that there is less forage available for over-wintering animals. Historically, major dzud have occurred roughly every seven years, but more experienced herders are not surprised when they occur in consecutive years as has happened recently.

Consecutive dzud during the severe winters of 1999-2000 through 2001-2002 brought home to policy makers and international donors alike just how risky Mongolia's environment is for livestock production. The unprecedented scale of recent dzud events had devastating impact on livelihoods, particularly for new, inexperienced herders.

The consecutive dzud of 1999/2000 to 2000/2001 resulted in combined losses of over seven million head of animals, or over 22 percent of the total livestock population. Almost 10,000 herding households were left with no animals at all, and a further 15,000 were left with fewer than 100 animals. A herd size of around 150 animals is generally regarded as the minimum required to maintain a livelihood for a typical herding household. Some 75 percent of herding households currently have herds of less than this minimum threshold size, and are highly vulnerable to the effects of drought and dzud.

Recent analysis of livestock mortality using a 30-year data set for all types of animals revealed that underlying vulnerability to drought and dzud varies widely throughout Mongolia. In this analysis, risk was modeled to test the feasibility of an index-based approach to livestock insurance, based on district-level livestock mortality data, rather than on assessing risk at the individual household level.[17] Dundgov province emerged as the province in which animal husbandry has historically been most risky, with mortality around five times higher than in the least risk-prone provinces. During the 1999/2000 dzud,

Map X. Relative risk index by province

Source: J. Skees and A. Enkh-Amgalan. 2002. "Examining the Feasibility of Livestock Insurance in Mongolia." *Policy Research Working Paper 2886*. Washington, DC: World Bank.

Dundgov lost over 30 percent of its total livestock. Over the two year period 1999-2001 the worst-affected province—Zavkhan—lost almost half of its total livestock.

It is inaccurate to view dzud as simply 'natural disasters'. The severe consequences of recent dzud owe as much to institutional failures as to Mongolia's harsh environment. While humanitarian assistance was essential for saving human lives, and livestock, the priority now is for GoM and the international community to ensure that appropriate action is taken to improve risk preparedness by herders, local governments, and other key actors.

To this end, GoM passed Resolution No. 47 in spring 2001, establishing a national program of action to improve risk preparedness in the face of drought and dzud. International support from the World Bank, International Fund for Agricultural Development, Asian Development Bank, and other agencies will be important in ensuring that it can be implemented effectively. A combination of diverse measures, including the following, is required:

- Longer-range risk forecasting, management, and contingency planning, including the clarification of institutional roles and responsibilities in dzud response;
- Measures to support marketing of livestock and livestock products, in part to permit rapid destocking at supported prices prior to dzud and drought;
- Support for community-based pastureland tenure and management arrangements to ensure the equitable implementation of key provisions of the existing land law. Such provisions include group-based approaches to well rehabilitation on remote, under-utilized pastures; and mechanisms for dispute and conflict resolution;
- Hay and fodder development and management, including testing of alternative business models for commercial hay and fodder production using mechanized and animal-drawn technologies, and revolving funds for emergency fodder supply and management at provincial level; and
- Development of micro-finance services appropriately tailored to herder needs, including weather and/or mortality index-based approaches to livestock insurance, and micro-credit.

In addition to these efforts, the longer-term challenge is to broaden the assets of the rural poor. Expanded opportunities for rural livelihood diversification beyond raising livestock would facilitate 'exit strategies' for the many herders who face little prospect of achieving a secure and sustainable livelihood in the livestock sector. Past experience under Mongolia's National Poverty Alleviation Program points to the importance of extending the outreach of micro-finance services to the poor in remote rural areas. Rural communities themselves must be able to prioritize investment needs and manage small-scale infrastructure such as wells, rural access roads, and facilities for health and education services. The Participatory Living Standards Assessment 2000 confirmed that rural communities would like to ensure that such investments and forms of service provision remain compatible with mobile livestock production.

Winter camps in the Selenge Aimag.

The 1992 Constitution and the 1994 Civil Code provide the overall legislative framework for land management and administration in Mongolia. The right to own property is a basic right recognized and guaranteed by the Constitution. Article 16 guarantees citizens the right to the fair acquisition, possession and inheritance of movable and immovable property, including land. Article 6 states that citizens may be given land for private ownership, with the exception of pastures and areas under public utilization and special use. State and public bodies may not appropriate private property except for public needs and with the payment of compensation.

Chapter 7 of the 1994 Civil Code contains provisions governing the creation, termination, transfer and inheritance of property rights. It also contains specific regulations on land ownership, possession and use rights. Article 87 restricts land ownership to Mongolian citizens, who are entitled to possess, use, and dispose of their property at their discretion according to law.

The Land Law, passed in 1994, regulates the possession and use of state-owned land, and land protection. Mongolian citizens, companies, and organizations may be granted the right to lease state-owned land (including pasture land, forest, and water basins) for up to 60 years, with the possibility of an extension for a further 40 years. Land use rights for specific purposes can be given to foreigners for up to five years through a contract, which may be extended by up to five years.

In order to implement the 1994 Land Law, GoM passed Resolution 143 in 1995. The Resolution gave local governments at the aimag and soum levels, primary responsibility for implementing the Land Law.

However, due to limited institutional capacity at these levels and insufficient implementation regulations, enforcement of the Land Law remains poor. To date, local governments have focused more on information gathering rather than on allocation of secure land rights.

The new Land Law and the Law on Mongolian Citizens' Ownership of Land, both approved in 2002, represent an important step toward land ownership and use by citizens and organizations, and regulation of transactions related to such ownership and use. The newly approved Law introduces a number of important improvements. Among these are the elimination of the shorter lease term (25 years) initially required for farming land, and the right of possession holders to transfer their licenses or use them as a collateral, after approval by the relevant local authorities. Also, it provides for better access to winter and spring camps and associated pasture, by introducing the possibility of allocating possession of land to groups not smaller than the herding camp (or *khot ail)*, as opposed to households as was previously the case. Summer and autumn camps will be allocated to bags and khot ail, and freely accessed by these communities. The new law aims to protect winter

Land Tenure Systems and Property Rights

Land tenure systems are usually categorized by forms of ownership. Private property, communal property, and state property are the three basic categories of property rights. A fourth category, open access, refers to situations where property rights are left unassigned. Under private property, land rights are assigned to an individual, whereas under state property, ownership of land is vested in the state. Under communal land tenure, the local community is regarded as owning the land, and use or usufruct rights are allocated to its members. All or some of these forms of ownership may exist in one country for different tracts of land. However, in most countries one ownership system tends to dominate. Land tenure systems can be created by state laws (statutory tenure) or have local origins in accordance with traditional practices (customary tenure).

In Mongolia, many forms of land tenure coexist. Once the new Land Law has been implemented, approximately one percent of the total land area, all of it urban or agricultural, will be under private ownership. Private ownership typically involves fewer restrictions on the use and transfer of land, greater security of tenure and ability to use land as a collateral. However, it may also lead to inequitable access to land, and a significant divergence between the private and social interests in the use of land. In the case of pastureland—where economic activity is limited, suitable alternative uses are lacking, and ecological risks are high—private ownership systems generally do not apply, but rather group possession rights are considered.

Source: Authors.

HISTORICAL EVOLUTION OF LAND LEGISLATION, 1229–2002

Name of legislation	*Year*	*Key provisions relating to land use*
Great Yassa (legal Code)	1229	(i) Consolidation and codification of customary laws of the confederated nomadic tribes of the Mongol Empire; (ii) Specific groups of herders explicitly linked with geographically defined territories; (iii) Nomadic movements coordinated by designated leaders.
Mongol-Oirat Regulations	1640	(i) Specifically addressed pasture rights of neighborhood groups of herders; (ii) Contained prohibitions against freely nomadic herders.
Khalka Djurim	1709	(i) Further codification of customary law of the steppe; (ii) Contained explicit references to pasture rights, distinguishing between secular and monastery herds following the rise of Tibetan Buddhism in Mongolia in late 16th century; (iii) Made provisions for sacred sites and reserved camp sites; (iv) Formalized criteria for settling disputes over campsites.
Manchu Imperial Legal Code	1798	(i) Aimed explicitly to restrict long distance nomadic movements, recognizing that it would allow for concentration and confederation of power among tribes; (ii) Territorial boundari es of princely fiefdoms officially surveyed, mapped and demarcated on the ground; maps held by aimag administrations and master copies in Peking; (iii) Movements across territorial boundaries by feudal princes and their subjects highly restricted; (iv) Customary pasture rights co-existed with formal regulations, the latter varying in specificity from one ecological zone to another; (v) Rights to winter camps and pasture well defined at individual level or shared by small groups of households; often designation of other seasonal pastures, migration routes and grazing reserves as well.
Land Utilization Code of Mongolian People's Republic (MPR)	1942	(i) Gave preferential rights to collective to select territories with the best pasture, arable and hay fields, and water sources; (ii) Basic pattern of seasonal pasture rotation retained, but herders confined within smaller, district territories (soum); (iii) Considerable investments in permanent shelters, fences and wells to improve livestock survival, and heavy promotion of otor (strategic movements of livestock for fattening, avoidance of drought and deep snow, or to bring them to fresh pasture).
MPR Land Use Law	1971	(i) All land in state ownership, granted in perpetuity to collectives, cooperatives and citizens; (ii) Collective leaders responsible for land allocation to herder members (in practice often following customary rights).
Constitution of Mongolia	1992	(i) State retains right of eminent domain over all land, which shall be subject to state protection; (ii) provides for private land ownership by citizens of Mongolia; (iii) Article 6 prohibits private ownership of pasture land, which remains in state ownership; (iv)Prohibits transfer of land to foreign citizens, although foreign citizens may lease land on limited terms; (v) Article 16 (3) confers right to fair acquisition, possession and inheritance of movable and immovable property; (vi) Precludes appropriation of private except for public need and on payment of due compensation.
Civil Code (revised)	1994	(i) Contains property law of Mongolia, governing creation, termination and transfer of property rights; also contract and inheritance law; (ii) Article 77, 87, 100 -117, and 143 specifically concern land ownership, possession and use rights; Art. 281 states that lease of land is governed separately by the Land Law; (iii) Article 95 provides for equal rights possession, use and disposal of family property by spouses and other family members; (iv) Article 181(1) inserted in amendment of October 1996 to allow mortgage of immovable property, including land as and when transferred to private ownership
Land Law	1994	(i) Regulates possession, use and protection of land; (ii) Articles 20 -24 specify roles of respective levels of central and local government, Article 51 regulates use and protection of pasture land, and Article 56 settlement of disputes; (iii) Obliges land possessors and users to meet various requirements of 'efficient and rational land use and protection'; (iv) Grants Mongolian citizens, economic entities and organizations the right to possess (lease) state owned land (including pasture land) for up to 60 years with possibility of extensions of up to 40 years; transfer to leasehold interest permitted only by inheritance; (v) Foreign citizens may obtain land use contract for 5 years with one possible extension, but are expressly forbidden from using the land for agriculture or livestock grazing.
Law on Special Protected Areas	1995	(i) Regulates use and procurement of land for state special protection and conservation to preserve unique land formation, rare and endangered species, historic and cultural monuments, and natural beauty; (ii) Designates four classifications of protected areas, and specifies respective protection regimes and where relevant permitted land uses in pristine, conservation and limited use zones of protected areas.
Law on Land Fee Payment	1997	(i) Provides for payment of fees by individual, business entities and organizations to the state budget for land utilization and possession; (ii) Pasture use possession calculated on the basis of the livestock units, land fertility and location; (iii) Herding households should be totally exempted from land fee payment for pasture and hay land use; (iv) 90% exemption to Mongolian citizen for individual plots up to 0.07 ha; (v) Land fee revenues shall be transferred to the local budget, and a certain percentage spent on land management, protection and rehabilitation.
Land Law	2002	See text for details.
Law on Mongolian Citizens' Ownership of Land	2002	See text for details.

Source: Agriteam Canada 1997. Study of Extensive Livestock Production Systems in Mongolia. Final report submitted to ADB. TA 2602.mon. Calgary.

and spring pastures, by preventing grazing during summer and fall (Article 54.2), and provides for sanctions to be imposed in cases of out-of-season trespass (Article 66.3).[18]

Although the Constitution provides for the private ownership of non-pastoral land, in practice all land has continued to be owned by the state. The Law on Mongolian Citizens' Ownership of Land, coming into effect in May 1, 2003, regulates the allocation of land to citizens of Mongolia for ownership, types and sizes of land to be owned, the power of the local administrations and the procedures for enacting land ownership. A complementary Act, the Land Fee Law, which will support the practical application of the Ownership Law, is still being considered by the Parliament. Presently, it is unclear how the provisions of the Law will be enacted.

While continuing to restrict ownership to Mongolian nationals, the new law specifically confers the right to own land not to every citizen but to every family officially registered at their respective administrative units. It is expected that after the implementation of the Law, approximately one percent of total Mongolian territory will be privately owned.

It is expected that privatization of land in urban areas (0.01 percent of total land) will be carried out for free, while subsequent acquisitions of land will require payment. Families in Ulaanbaatar are entitled to 0.07 ha. In rural aimag centers up to 0.35 ha, and in soum centers up to 0.5 ha of land will be allocated. Individuals who possess land on leasehold terms (including farming) have the preemptive right to purchase it form the state.

Logging opeartion in Kungkel, Selenge Aimag.

Protected areas are regulated, other than specifically by the Law on Special Protected Areas, by the 1994 Land Law and Resolution Number 143. The Law establishes that local governments are allowed to appropriate land under state special protection. Similarly, Resolution Number 143 authorizes the central government to acquire land under possession of citizens, entities and organizations for special needs. In such cases, the law provide for compensation to be paid to the license possessor.

Other important land-related laws include the following:

- Law on Subsoil (1989), regulates the use and protection of subsoil and licensing of related activities. It establishes that subsoil is the property of the State and can be given utilized by others only on the basis of a use contract.
- Forest Code (1995), regulates the rights over forest lands and recognizes community rights over this resource.
- General Law on Environmental Protection (1995), establishes duties of land owners, possessors and users to use the land and its resources in an environmentally sustainable way.
- Law on Registration of Immovable Property (1997), regulates the registration and protection of private ownership rights of immovable property.
- Law on Minerals (1997), regulates exploration and mining of mineral resources—except oil and gas—and licensing of related activities.
- Law of Cadastral Survey and Land Cadastre (1999), establishes the basis for the cadastral system development.
- Law on Immovable Property Tax (2000), imposes a tax on owners of immovable property.

THE GOOD GOVERNANCE FOR HUMAN SECURITY PROGRAMME, AND NATIONAL ENVIRONMENTAL ACTION PLAN

The 'Good Governance for Human Security Programme, which was approved in 2001, is GoM's official program to address the economic, financial, political, social, and environmental challenges facing Mongolia.

The Good Governance for Human Security Programme identifies 11 action priorities. The following three relate specifically to environmental issues: (i) Implement environmental policy aimed at providing sustainable development and ecological balance by harmonizing protection of biodiversity with regional socio-economic development; (ii) Intensify land reform; and (iii) Improve the living environment of the citizenry by reducing air, water and soil pollution in urban areas, and by recycling garbage and waste.

The development goals of the National Environmental Action Plan (NEAP), adopted in 1995, are in line with the priorities set in the Good Governance for Human Security Programme. The actions and objectives of NEAP have also been incorporated into the Programme's Action Plan for the next few years. These include sustainable use of the environment and natural resources, capacity building, improved public awareness and participation, pollution reduction, and combating desertification.

Source: Ministry of Nature and Environment, Ulaanbaatar.

Laws and Institutions Governing Mineral Exploration and Mining

Mongolia has extensive mineral resources, and has become home to some of the world's largest mining operations. Significant hydrocarbon potential and over 6,000 deposits of 80 different minerals have been discovered, including copper, coal, molybdenum, fluorspar, uranium, tin, tungsten and gold. The mining sector is now the country's largest industry, accounting for about 55 percent of total industrial output.

Mongolia's legal and fiscal regime for developing the mineral sector is one of the most progressive and transparent in Asia. It has, therefore, encouraged investment, especially by foreign companies. The legislative framework for managing mineral resources consists mainly of the Constitution, 1989 Subsoil Law, and 1997 Minerals Law, which clearly establish the State as having exclusive property rights over its mineral resources. The Minerals Law provides for a licensing system for exploration and mining activities, with simple and clear procedures. Thus far, about 20 percent of Mongolia's territory has been licensed for exploration and mining. Exploration licenses, up to 400,000 hectares each, can be granted for a maximum of seven years to Mongolian or foreign citizens or legal persons, with no restrictions on the number of licenses that can be granted to a person or legal entity. Mining licenses can be granted only to legal persons for a term of 60 years, extendable for a further period of 40 years, with no restrictions on the repatriation of profits. Mineral licenses can be transferred or pledged in whole or in part.

The Minerals Law contains provisions to address the environmental impact of mining activities (Articles 28-31). Relevant environmental protection authorities need to approve any exploration or mining activities. License holders are requested to prepare an environmental impact assessment, and an environment protection plan, which needs to be updated annually to ensure that pollution caused by the exploration activities does not exceed maximum limits. Investors are also required to report on steps taken to protect the environment and natural resources. However, license holders are not obligated to rehabilitate the area affected by mining activities, and to eliminate environmental dangers completely. They must deposit an amount equal to 50 percent of the environmental protection budget in a special bank account, to be refunded upon full implementation of the environmental protection plan. This provision has not led to environmental protection as had been expected. Operators often do not have the capacity to come up with the remaining 50 percent to complete environmental works. In general, enforcement of the environmental provisions has been problematic. A weak environmental inspection system is one of the many factors contributing to this problem.

At the central level, the institutions relevant to the mining sector are the Ministry of Industry and Trade (MIT), the Ministry of Infrastructure (MI), and the Ministry of Nature and Environment (MNE). The Mineral Resources Authority, and the State Inspection of Industry and Trade, are the core MIT agencies for overseeing the mining industry. The Mineral Resources Authority is responsible for the development and implementation of the geology and mining sectors' state policy. Specifically, it is tasked with providing and maintaining geological information, through the administration of the Geological Information Center. It also conducts research on the development of mineral resources, and suggests regulations for environmental protection and labor safety at mines. The Authority is also responsible for issuing licenses for mineral exploration and mining, through the Office of Geological and Mining Cadastre.

The State Inspection of Industry and Trade is responsible for monitoring exploration and mining activities and ensuring compliance with the laws on geology and mining, including environment friendly use of mineral resources. Through its Environmental Inspectors, MNE shares responsibilities for carrying out inspections of exploration and mining activities to ensure compliance with environmental laws. The Coal Agency under MI is responsible for managing state-owned mining operations. At the local level, provincial and district governments are responsible for organizing and ensuring implementation of mining legislation and compliance with environmental protection, health and safety regulations. At the provincial level, these activities are carried out by the Expert Inspection Office, under MIT, and the Environmental State Chief Inspector. Similarly, at the district level, inspectors have been appointed under both MIT and MNE. In 2002, with the goal of addressing the overlapping authorities of MIT and MNE, GoM issued a resolution on the reorganization of inspectorates, which provides for the establishment of a single Inspecting Agency reporting directly to the Prime Minister. The new agency is expected to be established in 2003.

Source: Authors.

Changes in Mongolian Land-Use Patterns, Land-Use Regulation, and Land Tenure

Mongol Empire (1206-1690)	*Manchu Rule and Autonomy (1691-1911)*	*Early Communism (1924-1959)*	*Collective (1960-1990)*	*Privatization (1990)*
Regulatory Institutions				
Clans and tribal groups	Monastery and secular nobility	Neighborhood groups (little formal regulation)	Collective	None
	Neighborhood groups (bag)			
Land-Use Patterns				
Wide ranging seasonal migrations	Confined to khoshuun (military-territorial units) boundaries	Reduced distance of migrations and diversity of ecological zones	Confined to sum brigades	Further reduced distance and frequency of moves
			Average of four moves per year	Year-round use of desert riparian and reserve pastures
	Lang distances, frequent moves, multiple ecological zones	Year-round use of desert riparian areas	Diversity of ecological resources reduced	Increased trespassing
			Many shelters built	Animals concentrated near towns and roads
Land-Use Regulations				
Clan chiefs signal and direct movement	Nobles direct movement	No enforced formal regulation of movement	Collectives enforce seasonal moves and otor	No formal regulation or enforcement
	Grazing prohibited in some areas	Neighborhood groups migrate together	Transport provided by collectives	Lack of coordinated seasonal movements
	Community sanctions for out-of-season use		Emergency reserve pasture areas	
Land Tenure and Legal Framework				
Chinggis Khan and his successors grant fields for political loyalty	Nobles allocate; no right to alienate	Customary rights within administration	Collectives allocate pasture, often along customary rights	Customary rights weak
	Lack of transport restricts access to the poor		All property state owned	Informal institutions of access in flux
Customary law of the steppe	Law of the steppe codified; first come, first serve		Disputes resolved by brigades and collective khural (council)	Pasture leasing system proposed
	Disputes resolved by tamga (administrative officer)		Inter-territorial use agreements	Disputes resolved by local governments (bag, soum)
	Inter-territorial use of agreements by the 1800s, quasi private rights to hay, shelters, and winter camps in some areas			Shelters privatized

Source: Maria E. Fernandez-Gimenez. 1999. "Sustaining the Steppes: A Geographical History of Pastoral Land Use in Mongolia," *The Geographical Review* 89 (3):315-342, July 1999.

Institutional Arrangements

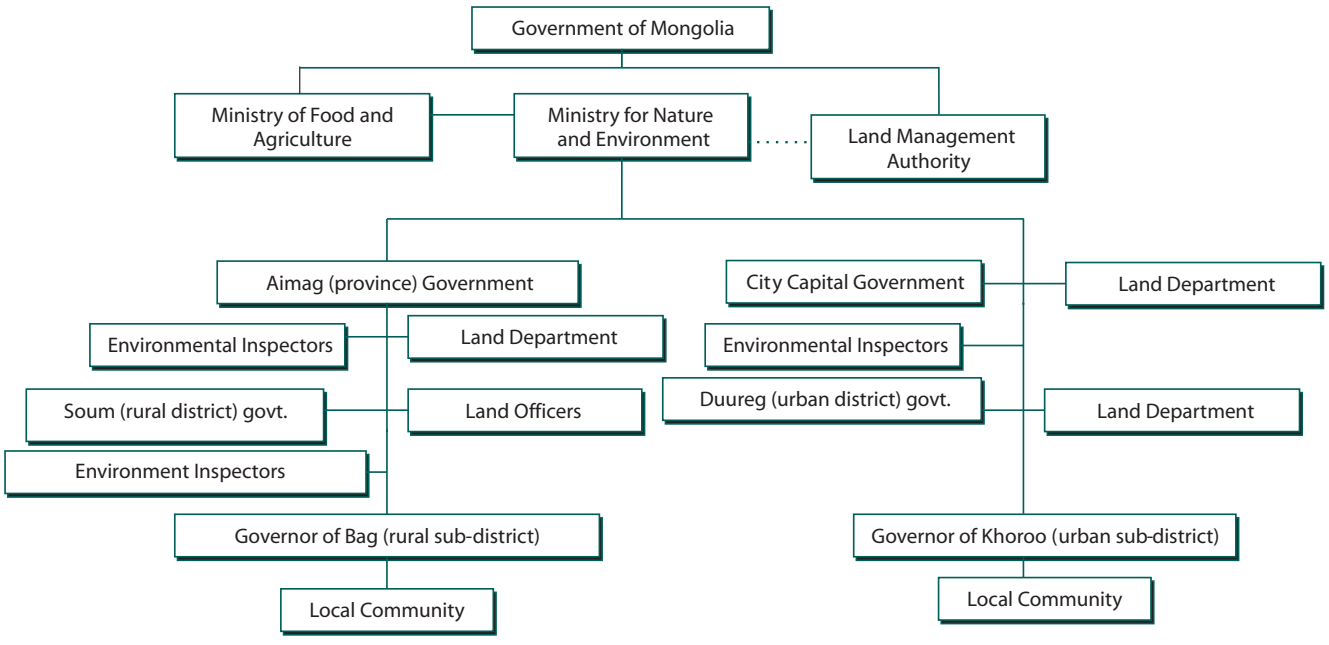
At the national level, policies relating to livestock production, environmental protection and natural resource use, and rural development are defined by the National Legislature's (*Ikh Khural*) Standing Committee on Rural Development and Environment. Primary responsibility for land use regulation, land management, protection and administration, lies with the Ministry of Nature and Environment (MNE). It is the lead agency for implementing GoM policy and legislation on land (specifically the Land Law, the Law on Ownership, and the Law on Cadastral Survey and Registration), and has the authority to approve standards and regulations on land management. The Ministry of Food and Agriculture (MFA) shares some of these responsibilities with regard to the livestock sector.

In 1997, a central Land Management Agency, with officers at national, provincial and district levels, was established to supervise and support the implementation of legislation and government regulations related to land use. Responsibilities for implementing legislation, and land planning and management activities are fairly decentralized. Provincial authorities (aimag and capital city) and district authorities (soum and duureg) are responsible for ensuring land policy implementation, enforcing land legislation in their territories, monitoring the use of land, drafting land management plans, and establishing pasture and settled livestock breeding areas within their territories.

At district level, environmental inspectors currently have dual responsibility for land management and environmental protection The problem is that they often lack the education and experience necessary to effectively carry out the functions assigned to them. Municipal authorities are also responsible for enforcing laws and monitoring the use of land. In general, municipal authorities are responsible for implementing decisions made at the district level, and are fundamentally responsible for the protection and use of common use lands

The 2002 Land Law has transferred the authority to grant land possession and use rights from the municipal (bag and khoroo) to the district (soum and duureg) level. Decisions on how land will be allocated for ownership will also be made at the district level. The application process has been streamlined, although it is still unclear what functions will be performed at the municipal level, and how land will be allocated in practice.

Likely Institutional Structure for Land Management



The new Law provides for the creation of a Land Management Authority reporting directly to the Prime Minister's office, which will supersede the previous Land Management Agency. Several land management functions at the national level (land registry, land cadastre maintenance and land administration) will be consolidated under this Authority. The Authority may also play a role in policy formulation. Its main responsibilities include implementing GoM land policy, developing a National Land Management Plan, administering cadastral activities, approving regulations land possession and land use licenses, and human resources development for land management. Land Departments will be established in each aimag, the capital city, and districts, and land officers will be appointed for each soum. However, a timeline for the establishment of the Authority has not yet been provided.

Similar responsibilities for land management activities and planning for their territories will be assigned to land department's officials at the aimag, capital city and district levels, and to land officers at the soum level. Further responsibilities include conducting cadastral surveys and keeping land databases, and levying land fees.

In general, authorities responsible for land management lack sufficient capacity to enforce existing legislation and the new reforms. Local governments face severe financial constraints and are unable to attract well trained staff.

The division of responsibilities for land management among different administration levels is unclear, and several overlaps exist between their mandates. The new Land Law simply states the roles of different levels of government, but fails to provide rules for dealing with overlaps, conflicts and gaps. Division of responsibility and lack of real coordination mechanisms between MNE and MFA have resulted in unsustainable land use and weak management. One of the most significant areas of conflict is the expansion of protected areas to cover customary grazing lands. In addition, both MNE and local governors are empowered to issue natural-use permits but there is no indication of which agency has jurisdiction under what circumstances. The unclear division of responsibility is exacerbated by inherent conflicts of interest. Most serious is the conflict of interest between district governors and local environmental and land use officers. The district governor, responsible for short term budgets, is unlikely to enforce the implementation of pasture land management plans, if these plans limit livestock numbers in a way that would reduce local budget revenues.

Section IV. Future Challenges

There is a growing recognition of the importance of Mongolia's natural resources, both within the Government and the international donor community. The Government is committed to protecting vast tracts of forests, wetlands and pastures. To this end, it has passed several laws and resolutions, and become signatory to important international conventions. However, the actual implementation of official policies continues to be weak, and Mongolia's environment faces mounting threats.

Based on the available information and analyses, this report has identified the following major challenges for the future:

1. *Public Access to Information.* There is little to no public access to information regarding the content of land legislation, and the implementation responsibilities of local governments. Such access is important because the mechanisms by which the new Land Law will be implemented are still unclear. Public consultation in the further development of national land legislation will be of paramount importance to ensure that local officials earn the trust of the people and can effectively carry out their responsibilities. In this context, it is critical that implementation guidelines be elaborate but clear, context-sensitive, and flexible, and that they be upheld in a transparent manner.

2. *Land-Poverty Nexus.* There are several GoM and bilateral initiatives that address the land-poverty nexus. These have yet to translate into substantial improvements in land management, both due to limited institutional capacity and the lack of viable alternatives to herding.

3. *Institutional Capacity for Disaster Management.* The institutional ability to respond to natural disasters remains weak. Although traditional herders have adapted to the harsh and unpredictable climate, newcomers and those with smaller herds, risk losing the bulk of their assets with every dzud event.

4. *Land Markets.* As the country completes a transition from a planned to a free-market economy, poorly functioning markets require strengthening. This would encourage more efficient use of forest resources, and stimulate the provision of alternatives to raw wood consumption such as briquettes.

5. *Laws on Pasture Use.* There are inherent conflicts between laws, especially with respect to use of pastures. As the new Land Law is implemented it is critical that such conflicts be resolved. Further, there are few alternative approaches to pasture-land dispute resolution. Such approaches would complement the administrative options enshrined in the land law.

6. *Community-based Forestry.* Community-based management of forest resources is a practical alternative to the top-down forest management approach that has yielded poor results. In addition to granting communities the rights to manage forests, local officials should have adequate financial and human resources to perform the monitoring duties that they are assigned.

7. *Environmental Management and Protection Funding.* In general, environmental monitoring and management are poorly funded and environmental protection provisions are rarely implemented. As the mining industry expands in Mongolia, it is critical that environmental safeguards are observed before, during and after the mining operations.

Geography	*Economy and Society*
Location: Northern Asia, between China and Russia	**GDP:** US$ 4.7 billion (2000 est.)
Total area: 1.565 million sq. km	**GDP growth rate:** 1 percent (2000 est.)
Land boundaries:Total:8,161.9 Km	**GDP composition by sector**: Agriculture: 36 percent Industry: 22 percent Services: . 42 percent (2000 est.)
Border countries: China 4,676.9 km Russia 3,485 km	**Currency:** Tögrög; U$ 1 = 1,097 Tögrög
Elevation extremes: Lowest point: Khoh Nuur 518 m; Highest point: Nayramadlin Orgil 4,374 m	**Inflation rate**: 7r**:** $200 million (1998 est.) **Industrial production growth rate:** 2.4% (2000 est.)
Mineral resources: oil, coal, copper, molybdenum, tungsten, phosphates, tin, nickel, zinc, gold, silver, iron	**Agriculture products:** wheat, barley, potatoes, fo rage crops; sheep, goats, cattle, camels, hors es
Land use: arable land: 5.7 percent permanent pastures: 81 percent forest and woodlands: 11.4 percent other: 1.9 percent (2000 est.)	**Exports total value:** $454.3 million (f.o.b., 1999) **Export partners:** China 60%, US 20%, Russia 9%, Japan 2% (2000 est.)
Irrigated land: 800 sq km (1993 est.)	**Imports-Total value:** $510.7 million (c.i.f., 1999) **Import Partners:** Russia 33%, China 21%, Japan 12%, South Korea 10%, US 4% (1999)
Climate: continental (large daily and seasonal temperature ranges)	**Population, mid-year:** 2,654,999 (2001 est.) **Population growth rate:** 1.4 percent (2001 est.) **Poverty (percent below poverty line):** 40 (2000 est.) **Birth rate**: 21.8 births/1,000 population (2001 est.) **Death rate:** 7.1 deaths/1,000 population (2001 est.) **Infant mortality rate:** 53.5 deaths/1,000 live births (2001 est.)
National capital: Ulaanbaatar	**Life expectancy at birth**: 64 years
Administrative divisions: 21 aimag (province), The aimag (=province) is the largest sub-national administrative unit; Mongolia is divided into 21 aimags. The sub-national administrative unit below the aimag is the soum (=district), which is divided into bag (=sub-district). In the capital city districts are called duureg and sub-districts khoroo.	**Access to safe water**: 60 % of total population **Access to sanitation**: 25 % of total population
Fiscal Year : January 1st – December 31st	**Literacy (at age 15) total population:** 97%
Independence: 11 July 1921 (from China)	

Notes

1. In mountain steppe areas the mean annual precipitation is around 250 mm, and in desert-steppe areas around or less than 100 mm.
2. Ellis, J.E., and T. Chuluun. 1993. "Cross –country survey of climate, ecology, and land use among Mongolian pastoralists." Paper presented at *Conference on Grassland Ecosystems of the Mongolian Steppe*, November 4-7, Racine, WI: Wingspread Center.
3. Fernandez-Gimenez, M.E., and B. Allen-Diaz. 1999. "Testing a non-equilibrium model of rangeland vegetation dynamics in Mongolia." *Journal of Applied Ecology* 36:871-885.
4. Mongolia uses two types of standard livestock unit: *bod*, based on large stock—horses and cattle; and *bog*, based on small stock—sheep and goats. The data here are expressed in *bod* units, and equivalents by species are 1 *bod* = 1 horse/cow (including yak), 7 sheep/goats, 0.5 camel.
5. For more information on environmental legislation , see Section III in this publication.
6. Closed canopy is the description given to a stand of trees when the main level of trees forming the canopy are touching and intermingled so that light cannot reach the forest floor directly.
7. A larch tree just 2.5 cm in diameter can be 40 years old.
8. The larch bud moth and the Asian gypsy moth, which feed on larch and other trees, affect an average of about 100,000 ha each year.
9. World Wildlife Fund. 2000. *The Global 200 Eco-regions. http://www.panda.org/about_wwf/where_we_work/ecoregions/global zoo/pages/home.htm*
10. Gunin, and others. 1999. *Vegetation Dynamics of Mongolia*; Kluwer, Amsterdam .
11. *Soum* (district) is the sub-national administrative unit below the *Aimag* (province) in rural areas. Soum are divided into *Bag* (subdistricts). In the capital city and other urban areas, districts are called *Duureg*, and sub-districts are referred to as *Khoroo*.
12. It is not clear, for example, whether the definitions refer to changes in range vegetation cover or species composition; whether they are based on field observations, and if so, from how many experimental plots; and whether or not the processes of vegetation change are thought to be irreversible.
13. This represents an increase from 351,000 people, or 17 percent of the population, to 834,750 people, or 34 percent of the population.
14. NSO and World Bank. 2000 '*Mongolia Participatory Living Standard Assessment 2000*.' Ulaanbaatar: Mongolia National Statistical Office and World Bank.
15. *Dzud* is the collective term for a range of winter weather-related conditions that prevent domestic animals from foraging in open grazing. For details see the following subsection.
16. Mearns, R. 1996. "Community, collective action and common grazing: the case of post-socialist Mongolia." *Journal of Development Studies*, 32 (3):297-339.
17. Skees, J., and A. Enkh-Amgalan. 2002. "Examining the Feasibility of Livestock Insurance in Mongolia." *Policy Research Working Paper 2886*. Washington, DC: World Bank.
18. There appears to be a contradiction in the new Law, between Article 6.2 and Article 54.2, with regard to free access to pastures. Article 6.2 states that, pasturelands, water points in pasturelands, wells and salt licks are among those types of land that "regardless of whether they are given into possession or use, shall be used for common purpose under government regulation."

THE WORLD BANK
1818 H Street, NW
Washington, D. C. 20433 U.S.A.

Tel: 202-477-1234
Fax: 202-477-6391
Telex: MCI 64145 WORLDBANK
MCI 248423 WORLDBANK
Internet: http://worldbank.org

THE WORLD BANK
MONGOLIA OFFICE
Ulaanbaatar, 11 A Peace Avenue
Ulaanbaatar 210648, Mongolia