

The logo consists of three vertical rectangular panels. The left and right panels are orange, and the middle panel is blue. The text 'Mongolia Environment Monitor' is centered in the blue panel in a black serif font.

**Mongolia
Environment
Monitor**

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FOREWORD

I have recently completed my first visit to Mongolia - a large and land-locked country with long and fearfully-cold winters, and hot and drought-prone summers. I was able to see and learn a great deal in a relatively short time. Mongolia may have one of the world's least dense populations, yet the land and its vegetation are fragile and can bear the scars of inappropriate use for decades before they are healed. I commend the government for seeking to integrate environmental concerns into its development planning.

The World Bank has been developing a varied program of environmental management assistance to Mongolia for over seven years. It has worked with the Ministry of Nature and Environment, with academics, with the Buddhist community and with NGOs. We look forward to further consolidating these collaborative efforts, and expanding them through similar initiatives and major Bank assistance, for example in the forestry sector.

This *Mongolia Environment Monitor* is the latest in a series of similar publications produced for countries in East Asia. The Mongolian version will be distributed widely to high schools and universities to help inform and stimulate, and we hope to welcome people to use the new Public Information Center at our office in Ulaanbaatar. In these ways my hope is that more and more people will participate in open and constructive debate and actions to help safeguard the Mongolian environment for future generations.



James D. Wolfensohn

Preface

Mongolia's magnificent landscapes, diverse ecosystems and rare species are of global importance, and are central to the country's well-being. Yet, the land and other natural resources are facing mounting threats.

Mongolia's growing population and changing lifestyles are intensifying pressures on the country's fragile ecosystems. Overgrazing is degrading significant areas and displacing wildlife from its habitat. Pollution from industrial and urban growth is negatively affecting environmental quality. Moreover, hampering progress in the management and protection of the environment is a conspicuous lack of human and financial resources and low institutional capacity.

To address these challenges, the Government of Mongolia has enacted a series of environmental laws, expanded its system of nature reserves, adopted energy efficient technologies, and invested in pollution-abatement schemes. To further its strategic objectives, the Government is revising the 1995 National Environmental Action Plan, and has mainstreamed environmental concerns into its official Good Governance for Human Security Programme.

As Mongolia completes its transition from a centrally-planned to a market economy, it is important for the Government to promote the understanding of the fundamental contribution that natural resources and a healthy environment make to the country's growth. To this end, the Government is working with international organizations, civil society, and non-governmental organizations.

Effective implementation of these initiatives also requires analyzing environmental trends and monitoring key indicators. This Environment Monitor presents key environmental trends in Mongolia. The information contained here has been obtained from many sources, including reports published by government agencies, universities, non-governmental organizations, documents of the World Bank, the Asian Development Bank, bilateral donor agencies, and unpublished reports from individuals.

An attempt has been made to create an *Environmental Scorecard* to benchmark several key indicators of production, consumption, pollution and ambient quality. From the paucity of available data, it is clear that Mongolia must substantially build its capacity to collect timely information on key environmental trends. This is important for the Government to translate the *Millennium Development Goals* into effective action.

For decision-makers, the *Monitor* provides key environmental information in a single document and highlights the importance of up-to-date information for formulating policies and plans. For academics and researchers, it gives a broad overview of problem areas. For civil society, it offers an opportunity to engage in a dialogue with other stakeholders. For donor agencies, it sheds light on the constraints and possibilities inherent in Mongolia's current environmental challenges. Overall, the *Monitor* can serve to engage and inform stakeholders concerning environmental changes and challenges. Subsequent issues, to be published annually, will focus on selected environmental topics of interest.

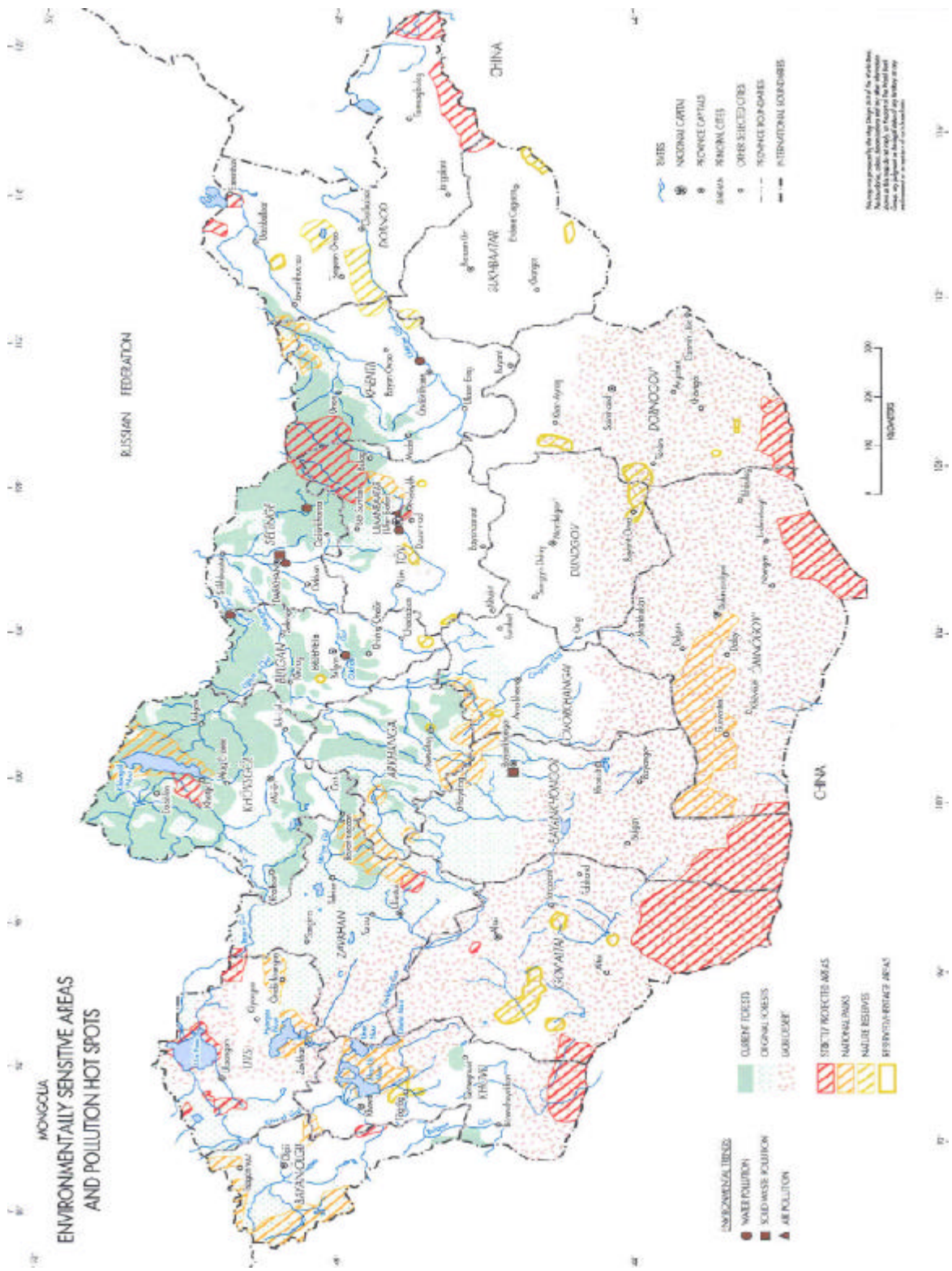
Abbreviations and Acronyms

ADB	Asian Development Bank
ARD	acute respiratory disease
AUSAID	Australia International Development Agency
BOD	biochemical oxygen demand
CHP	combined heat-power stations
CIDA	Canada International Development Agency
DANIDA	Danish International Development Agency
DO	dissolved oxygen
EIA	environmental impact assessment
EMP	environmental management plan
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GoM	Government of Mongolia
GTZ	German Technical Cooperation Agency
HOB	heat-only-boilers
IDRC	International Development Research Center
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
km	kilometer
m³	cubic meter
MAP-21	Mongolia Action Plan for the 21 st Century
µg/m³	microgram per cubic meter
MNE	Ministry of Nature and Environment
NEAP	national environmental action plan
NGO	Non-Governmental Organization
NO₂	nitrogen dioxide
NSO	National Statistical Office
O&M	operation and maintenance
SO₂	sulfur dioxide
TCB	total coliform bacteria
UN	United Nations
UNDP	United Nations Development Program
UNSO	United Nations Office to Combat Desertification and Drought
USAID	United States Agency for International Development
WB	The World Bank Group

Weights and Measures

ha	10,000 m ²
km ²	100 hectares

Map of Environmental Hot Spots Map



Environmental Scorecard: Trends and Indicators

Issues	Trends	Causes
Green		
Declining forest cover	<ul style="list-style-type: none"> Between 1990 and 2000 60,000 ha of forest have been lost; More than 7 million ha of forest has been affected by fires between 1990 and 2000 	<ul style="list-style-type: none"> Incorrect policies and poor enforcement Poor technical and infrastructure support for sustainable logging regimes Increasing domestic demand for fuelwood and timber
Loss of critical habitats/biodiversity	<ul style="list-style-type: none"> Domestic livestock crowds out wild species; Illegal hunting/fishing tourism is increasing; Over collection of medicinal plants 	<ul style="list-style-type: none"> Land use changes Deforestation Inadequate regulation for hunting/fishing practices
Land degradation	<ul style="list-style-type: none"> 5-9 percent of all pasture land is currently degraded 	<ul style="list-style-type: none"> Inappropriate land use practices Natural disasters (dzud; drought; steppe fires)
Blue		
Water supply unable to keep up with demand	<ul style="list-style-type: none"> Water flows in the Tuul, Haraa, and Herlen rivers are declining Groundwater table levels have been falling 	<ul style="list-style-type: none"> Improper water pricing Limited and worn out infrastructure Urbanization
Brown		
Declining air quality in Ulaanbaatar and other urban centers	<ul style="list-style-type: none"> Levels of SO₂ and NO₂ from power generation, heating and automobiles have been increasing steadily over the past 10 years Increased number of children under age five suffering from respiratory diseases 	<ul style="list-style-type: none"> Industry Power generation and heating Transport Dust Garbage burning
Declining water quality in major rivers	<ul style="list-style-type: none"> Toxic and hazardous waste a danger 	<ul style="list-style-type: none"> Industrial effluents Domestic sewage Solid waste
Increasing solid and hazardous waste generation and improper management	<ul style="list-style-type: none"> Increased generation of solid waste over the last 10 years Open dumping and burning continues Increased generation of toxic and hazardous waste 	<ul style="list-style-type: none"> Urbanization Lack of an integrated solid waste management system Limited public awareness Absence of toxic and hazardous waste disposal facilities

This scorecard represents the first attempt at benchmarking key environmental indicators in Mongolia. The selection of indicators was predicated on the availability of credible data. The indicators selected here represent both production/consumption and deterioration/quality factors, and are classified under *Brown*, *Green* and *Blue Agendas*.

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Environmental Scorecard: Trends and Indicators

Indicators	Value	Period Covered
Green		
Annual rate of deforestation	0.3 percent	1900 - 2000
Annual loss of commercial forest	4 to 6 percent	1990 - 2000
Area of forest affected by fires	7.1 million ha	1990 - 2000
Area of grassland affected by steppe fires	41.1 million ha	1990-2000
Livestock number <i>(vegetation cover represent a more accurate indicator, and it is currently being developed)</i>	30 million heads	2000
Blue		
Percentage of population with access to safe drinking water	60 percent of total population 77 percent of urban population 33 percent of rural population	2000
Brown		
NO ₂ levels	Average annual mean concentration increased from 14 to 25.5 µg/m ³	1994 - 2000
SO ₂ levels	Average annual mean concentration increased from 4 to 9 µg/m ³	1994 - 2000
Dust	137 µg/m ³ annual average concentration	1994 - 2000
Annual consumption of coal for energy production, heating and cooking	5.7 million tonnes	1999 - 2002
Percentage of population with access to sanitation	25 percent of total population 46 percent of urban population 2 percent of rural population	2000
Percentage of population benefiting from solid waste management	40 percent	1980 - 2000

The *Brown Agenda* is a term commonly used to address pollution caused by industrial, urban, transport and energy sources and their single or collective impacts and protection measures. The *Green Agenda* describes environmental impacts caused by agriculture, deforestation, land use changes and destruction of protected species and related protection measures. The *Blue Agenda* refers to all forms of water resources management. The *Environmental Scorecard* will be the basis to record future improvements or deterioration in environmental quality.

Green Agenda Forestry

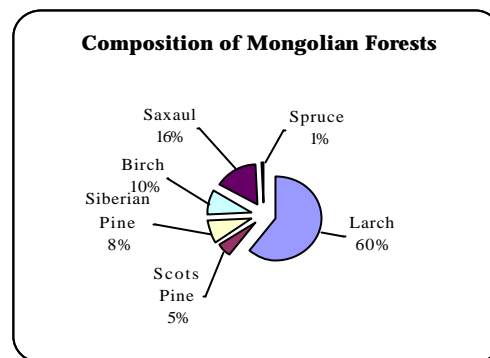
Over 18.3 million hectares (ha) of Mongolia, -or 11 percent of its area- are covered by forests. Coniferous forests, which are part of the Siberian Taiga, cover the north-central mountains. Saxaul trees are found in the south-southwest deserts. They protect the land against erosion and desertification, and provide seasonal livestock fodder and fuel wood.

During the last century, Mongolia lost approximately 4 million ha of forests, averaging 40,000 ha annually. However, between 1990 and 2000, the rate of deforestation increased to 60,000 ha per year -mostly from potentially commercial forests. As a result of this ongoing loss and degradation, only 13 million ha of forests are closed canopy, relatively remote forests. Much of the other 5.3 million ha of forests are fragmented and degraded.

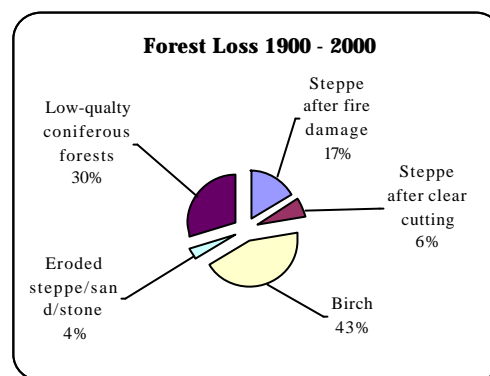
A long-term, cyclical drying of Mongolia's climate is causing a slow northerly retreat of its forests. However, much of the recent, rapid deforestation is primarily due to fire, improper commercial and illegal logging, inadequate enforcement of forest rules and regulations, grazing and browsing of young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

All forest land is state-owned, and the right to use it can be granted to companies or communities. Commercial forestry in Mongolia began 30-40 years ago when large areas were clear felled, a practice that is now outlawed. Currently, over one million ha are designated for commercial forestry but less than one percent has been leased.

Since the beginning of the economic transition in the mid-1990s, the forest industry has been beset by many problems. Among them are a lack of investment, an inadequately trained workforce, obsolete machinery, and unclear institutional responsibilities. Before the transition, some 2.2 million cubic meters (m³) of timber were produced annually. The timber industry contributed 6 percent of the country's GDP and employed 20,000 people.



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



The forests in Khenti (H. Knapp, Summer 2000)

Green Agenda Forestry

The current volume of annual timber production is 0.5 million m³ and the contribution of the industry to GDP is less than 1 percent. Currently, fewer than 3,000 workers are employed in the industry, mostly in small enterprise units in Selenge Aimag.¹ Real incentives for the rejuvenation of the wood-processing industry are still absent, and investment has been hampered by high interest rates on bank loans

In addition to felling for timber, wood is

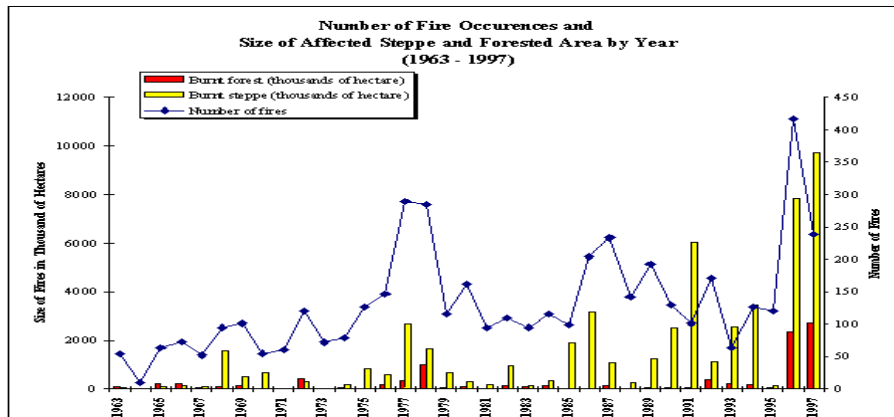
also collected from the northern forests for heating and cooking, either as the sole fuel or for starting coal fires.

The quantity of wood used for heating and other household purposes is estimated to be 1.5 million m³. Much of this wood is harvested illegally. Although there is official acknowledgement of such practices, as well as of illegal logs being smuggled across the border with China, data indicating the extent of these problems does not exist.

Forest and Steppe Fires

Low humidity, a dry climate, and strong winds in the dry season make Mongolia one of the most fire-prone countries in Asia. More than half of the country is considered a fire-risk zone, and 98.5 percent of forests are classified as high fire risk areas. The probability of fire rises dramatically from March to May, and September to November; more than 60 percent of all fires occurring between April and May every year. Although such fires are occasionally natural, most are caused by hunters whose campfires get out of control. During the last 10 years, 1,833 steppe and forest fires were recorded. These affected 41.1 million ha of pastureland and 7.1 million ha of forest. In 1996 alone there were 417 fires –the most in a decade--, which caused damage estimated at 1.13 billion Tögrögs. Because of Mongolia's severe cold and aridity, the growing season is short. Consequently, forests may require up to 200 years to regenerate after such a disturbance.

Prior to Transition, a branch of the Civil Defense managed fire events using trained teams of staff and the Aerial Patrol Service. Today, GoM promotes integrated fire management focusing on education and enforcement, readiness, and controlling and extinguishing unwanted fires. Pilot efforts demonstrate the effectiveness of this approach at the local level, although securing adequate resources, at the national level, remains a challenge. However, the ongoing partnership between Japan and Mongolia for the creation of forest nurseries in the Khentii Aimag and outside the city of Ulaanbaatar is helping the Ministry of Nature and Environment (MNE) restore fire-damaged areas.



Source: Ministry of Nature and Environment, Ulaanbaatar, November 2001.

¹ The 'aimag' is the largest sub-national administrative unit. Mongolia is divided into 21 aimag. See also, Mongolia at a Glance Section.

Green Agenda Forestry Policy Responses

Since 1990, the institutional and legal framework of the forestry sector has changed several times. The 'Law on Forests', the 'Law on Protection from Forest and Steppe Fires', the 'National Forestry Policy' and the 'National Forest Master Programme' have provided the legal foundation for the protection and proper use of forests. In addition, the National Forest Council was formed in 2001 to revitalize the wood industry and support the social functions of forestry.

The Government has had a program of tree replanting for 30 years. The area successfully replanted represents only 5 percent of the total forest lost, mostly due to low survival rates of the seedlings. At present, 150,000 ha of forest need to be restored; however, only 5,000 ha are being restored annually.



The forests of Khenti (H. Knapp, Summer 2000)

Green Agenda Biodiversity

Two of the world's most biologically outstanding 'ecoregions' – the Daurian steppes and the Altai-Sayan Mountains are in Mongolia.² Coniferous forests and extensive alpine landscapes form a biogeographic divide between Siberia and the desert basins of Central Asia and are a center of plant and animal biodiversity.

The 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.³) 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. The most dramatic fish species in Mongolia is the exceptionally ferocious taimen, the world's largest salmon, now fished to extinction in Russia.

Many plants and animals are used both for local purposes or 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.

Mongolia's biodiversity is, however, facing significant threats from a host of sources. Over use and over collection of plant and animal species is the main threat. Steppe and forest fires kill wildlife and also reduce the area of habitat available. Grazing livestock put pressure on grasslands, thereby reducing their diversity, productivity, and nutritional value. 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.



Desert vegetation (Whitten, Fall 2001)

Tourism is steadily becoming more important, as fabulous landscapes and wildlife remain a powerful attraction. In 1997, tourism contributed between 5 to 10 percent of total foreign exchange earnings. Because the total number of tourists is still relatively low, the overall environmental impacts are localized, with the exception of the Karakorum area, Gorkhi Terelj National Conservation Park, and the Yolin-Am Gorge in the Gobi Gurvansaikhan National Park. Solid waste generation, excessive water use, lack of sanitation, and tire damage to the soil surface are the main causes of degradation in these parks.

² World Wildlife Fund, Endangered Species- *The Global 200 Eco-regions* (2000).

³ Gunin et al., *Vegetation Dynamics of Mongolia*; Kluwer, Amsterdam (1999).

Green Agenda Biodiversity

Hunting in Mongolia

Subsistence Hunting

Recent studies have found that subsistence hunting is more common among the rich (60 percent) than the poor herders (50 percent). However, on average, the time rich herders spend hunting is one-third that of poor herders. To ensure sustainability, GoM requires herders to purchase a hunting license, which specifies the number of animals, per species, that can be killed in a year. The number of purchased licenses has been rising since 1995, and yet the recorded average number of animals killed for each license has been falling due to the majority of hunters seem to be cheating on their licenses. Part of the reason is that the license price is supposed to be 20 percent of the market value, - which is very volatile- thus encouraging hunters not to purchase licenses. It has been estimated that the Eastern aimags governments lost, at least, 42 million Tögrögs in potential license sales last year.

Hunting Tourism

Over the past 10 years, hunting tourism has grown in popularity. This form of hunting is controversial because its impacts on wildlife are not clearly known. Hunting tourism also requires the purchase of a license, which vary in cost depending on the species being sought. The cost of the hunting license for an Argali sheep, depending on its size and region, ranges from US\$ 20,000 to 35,000; the gazelle costs between US\$ 10,000 and US\$ 15,000; the falcon US\$ 4,500; the elk US\$ 3,500; the brown bear US\$ 2,500; the lynx US\$ 2,000; and the Mongolian ibex and red deer US\$ 1,000.

License revenues from regulated hunting tourism were estimated to be US\$3 million in 1997. Legally 70 percent of such earnings should go to the central government budget, 20 percent to the local administration, and 10 percent to the hunting company. However, it appears that more than 75 percent of the earnings remain with hunting companies and only about 10 percent go to MNE and local governments.

Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



Steppe vegetation covered by the snow (Whitten, Winter 2001)

Green Agenda Biodiversity Policy Responses

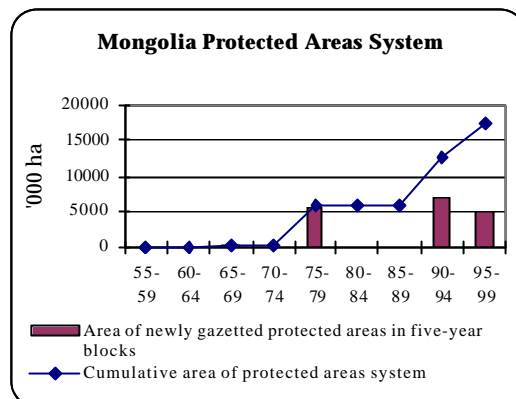
The Government of Mongolia recognizes the significance of its biodiversity in the world's biological heritage as an economic resource and a source of spiritual enjoyment for Mongolians and others. Throughout history, it has protected lands and species that have been deemed special to the people of Mongolia.

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 1 million ha.

Although the percentage of land currently under protection exceeds international norms, GoM intends to increase its protected area network to up to 30 per cent of the country's territory.

The large-scale commercial slaughter of Mongolian gazelles, mainly in the eastern steppes, has been outlawed, although subsistence hunting is still permitted. Sustainable eco-tourism, based on barbless-hooks and catch-and-return management, has been established near Lake Khovsgol, where large taimen can still be found.

There are various Mongolian laws and regulations relevant to the protection of biodiversity. In 1996, GoM also adopted the Biodiversity Conservation Action Plan, and became a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora.



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002

Buddhist Stewardship of Natural Resources

As part of the global World Wildlife Fund (WWF) program "Sacred Gifts to the Planet", WWF-Mongolia has been working with the Buddhist community to promote Buddhist teachings on the stewardship of land. The Mongolian Gift is to reintroduce a centuries-old traditional ban on hunting and logging in the Buddhist sacred sites. This was announced in May 2000, on Buddha's traditional birthday, by the Head Lama of Mongolia, and communicated through more than 140 monasteries across the country

It is estimated that there are more than 600 sacred Buddhist sites in Mongolia, including sacred mountains, forests, trees and springs. The ban is an expression of the ancient Buddhist teaching of compassion toward all life, which encourages Buddhists to engage in sustainable natural resource management. The re-creation of Buddhist reserves and the re-introduction of the ban on logging and hunting are expected to create strong moral and religious support for the protection of natural resources and the environment.

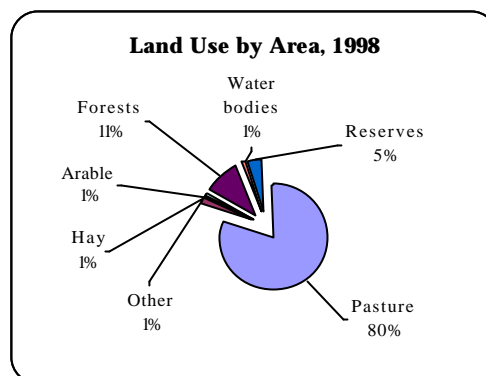
Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002

Green Agenda Land

Mongolia has a land area of approximately 1.56 million sq. km. With population growth, average land area per capita has fallen from an average of 2.42 km² in 1919 to 0.64 km² in 1997. Approximately, 82 percent of the land area is grassland, and represents the largest remaining contiguous area of common grazing in the world. This pasture area encompasses a wide range of ecosystems, including desert-steppes and forest/mountain steppes.

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. Differences in estimates of land degradation in Mongolia may arise from the definitions of land degradation which differ among the agencies. The Mongolian Land Administration Agency estimates that 9 percent of pastureland is 'degraded to some extent'. The NEAP 2002, however, suggests that 7 percent of pastureland has become 'heavily degraded', while 70 percent is 'degraded'. The Mongolian Action Plan for the 21st Century (MAP-21) estimates that between 5-9 percent of pastureland had become 'severely degraded' and that 30 percent had been 'damaged', by 1998. It also estimates that as much as 78 percent of the total land area is 'degraded'.

In dryland grazing ecosystems that are in relative 'equilibrium' there is a close coupling of livestock population density with range vegetation condition. However, most of the world's dryland grazing ecosystems, including Mongolia, are not at 'equilibrium'. Range vegetation condition in these areas is influenced more strongly by highly variable precipitation than by livestock grazing density.



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



Tire trucks prints crossing the Mongolian steppe.
(Whitten, Fall 2001)

Green Agenda Land

All of Mongolia's rangeland is in arid and semi-arid areas, where the coefficient of inter-annual variation in precipitation ranges from 28 percent in mountain-steppe areas, to 50 percent in desert-steppe areas.⁴

In those areas where the coefficient of inter-annual variation in rainfall is higher than 33 percent, range vegetation condition tends to be more influenced by the level of precipitation than by changes in grazing pressure. Present evidence gives grounds for concern that in the wetter mountain steppe zones livestock population density is having an adverse effect on range vegetation. Elsewhere it is much more difficult to establish a causal link between livestock population density and the condition of vegetation. In addition, insufficient resting periods between grazing seasons, increasing constraints on available pasture land in the accessible steppes, and congestion in many forest/mountain steppes, where topography is a limiting factor, are also recognized as contributing factors to land degradation.

Desertification refers to *'land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities'*⁵. Some 41 percent of Mongolia's land area is known as Gobi: a stony desert with very sparse, shrub vegetation. This may account for the high estimate of the total land area that is said to be 'damaged' cited in MAP-21; however, low primary productivity in the Gobi is independent of human use. The extend of Mongolian territory covered by sand has been 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

⁴ In mountain-steppe areas the mean annual precipitation is around 250 mm, and in desert-steppe areas around 100 mm or less.

⁵ Plan of Action to Combat Desertification, UN Convention to Combat Desertification, Geneva 1977.

Community-based Pastureland Management

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

The project concept was based on the following hypothesis: herders are more likely to cooperate in pastureland management when they 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 made external support available in several mutually supporting areas. It provided institutional capacity building for 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-orientated and socially-inclusive pastureland-use practices.

While it is too early to judge the long-term impact of the institutional innovations introduced under the project, there are plans to replicate and scale-up this pilot under new programs supported by the World Bank, Asian Development Bank, and the Government of the Netherlands.

Source: Support Implementing Mongolian Action Plan-21: Strengthening Customary Herding Communities, Ulaabaatar: Center for Policy Research, 2002

Green Agenda Land Policy Responses

The Constitution and the Civil Code provide an overall framework for land legislation in Mongolia⁶. The 1995 Land Law provides four types of group and individual land rights over certain land categories. These are 'ownership', 'possession', 'use' and 'limited use' rights. Pastureland is protected as 'common land', and cannot come under private ownership. Possession rights are assigned for an initial period of 60 years, renewable for another 40 years, and are transferred only through inheritance. Use rights are secondary rights, assigned by those holding possession contracts, but are not transferable to third parties. Although the Law allows for the possibility of private land ownership of other land categories, the legal mechanisms to introduce such ownership have not yet been established.

By 1999-2000, winter campsites had widely been allocated by local governments to individual herding households, –under possession contracts of varying lengths, usually between 25 to 40 years. In principle, the legislative framework for pastureland management is supportive of mobile pastoral livestock production, and provides for the continuation of customary forms of seasonal pasture rotation. In practice, however, demographic, economic and social changes have led to declining mobility and seasonal pasture rotation, and relatively little progress has been made by local governments in implementing the Land Law.

Current proposals to amend the Land Law may overturn the possibility of assigning pastureland tenure to particular groups of

herders. It makes pastureland a de jure open-access resource, and further undermine the possibility of empowering herding communities to manage their local pastures as controlled-access commons.

The 'Law on Land Fee' adopted in 1995, imposes a land possession and use fee based on the natural zone and classification of soil quality. A Land Protection Fund composed of land use fees collected from citizens, economic entities and organizations has been created. The land use fee revenues of up to 30 percent is spent for land protection and restoration activities. Citizens, economic entities, and organizations that work to reverse land degradation and soil erosion are exempt from land use fee. The Land Administration Agency (formerly Land Management Authority) was established in 1997. In 2000, the 'General Land Management Plan' was devised to promote ecologically sustainable land management. The Government's Resolution No. 47 of March 2001 provides a framework for pastoral risk management, and focuses on assisting herders and local governments prepare for risk episode and to better manage their impacts.

Mongolia became a member of the UN Convention on Desertification in 1996 and established a National Plan to Combat Desertification. Overgrazing, improving water supply to pastures, and insect and rodent control on pastures are major foci of the plan. However, according to the National Environmental Action Plan (NEAP) current implementation of land protection and restoration laws are not satisfactory and needs to strengthen land management institutions at all administrative levels.

⁶ Hanstad, T., and J. Duncan *Land Reform in Mongolia: Observations and Recommendations*. Rural Development Institute, Reports in Foreign Aid and Development, No. 109, Seattle, USA, 2001

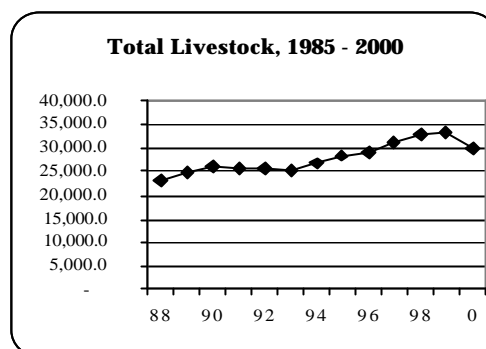
Issue in Focus

Livelihood and Livestock Change between 1999 and 2000

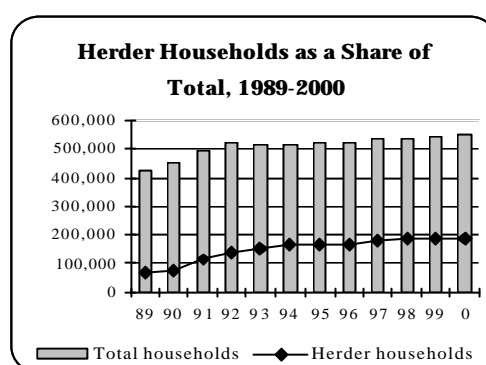
With the economic transition, and in the absence of alternative livelihood opportunities, many people turned to livestock production to support their families. The total number of herding households more than doubled, from 75,000 households in 1990 (17 percent of total population) to 192,000 in 2000 (35 percent of total population). Differences between new and existing herders –in terms of their livelihood orientation, levels of wealth, and skill and experience in herding– have had profound implications for grassland management since they influence the mobility of the herders and their animals as well as their choice of where to graze them.

Mobility and knowledge are, therefore, essential to protecting the pastures from overgrazing. In general, newcomers to herding were less skilled and experienced in livestock production, and tended to move less frequently and to remain closer to settlements, roads, and other point of market access. By the late 1990s, however, wealthier herders also tended to move less frequently, and began maintaining a year-round base at the best winter-spring campsites to guard the pastures they claimed from out-of-season trespassers.

Total livestock numbers also increased significantly, from an estimated 25 million head in 1990 to 30 million head by the end of 2000. The most significant increase took place from 1993 to 1999, when total livestock numbers reached over 33 million head (a 33 percent increase). The main reason for this substantial increase was the breakdown of the centralized marketing system that had prevailed under collectivized agriculture. For several decades, centralized markets for meat and other livestock products that met domestic and export demand had limited national herd growth. Because the Government was a guaranteed buyer of livestock, fewer animals needed to be carried and fed over the harsh winter/spring period.



Source: National Statistical Office. 2001. *Mongolian National Statistical Yearbook 2000*; Ulaanbaatar



Source: National Statistical Office. 2001. *Mongolian National Statistical Yearbook 2000*; Ulaanbaatar



Cashmere goats (H. Mix, 2000)

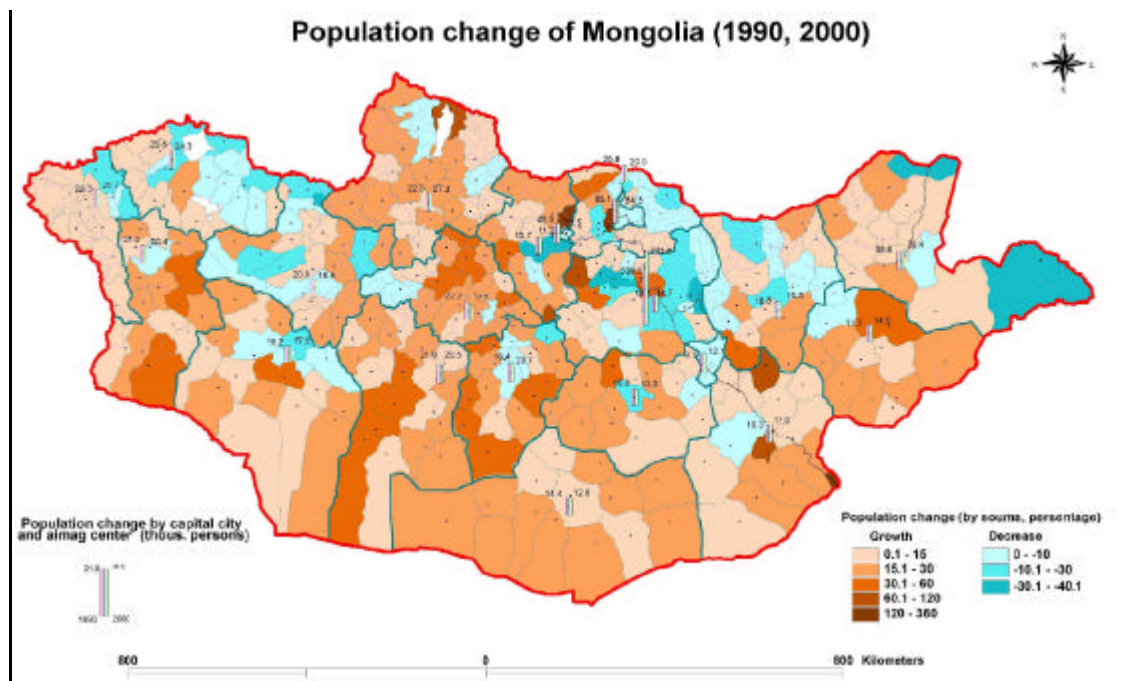
Issue in Focus

Livelihood and Livestock Change between 1999 and 2000

The breakdown of this centralized 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 mid-1990s, increasing the size of household herds became herders' chief objective.

In the late 1990s, deteriorating terms of trade for herding households also had implications for livelihood strategies.⁷ Among these was a marked tendency for herders to migrate yet further toward markets to improve their household terms of trade.

This process of population concentration has been 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). The scale of migration became such a major concern for the Government that, in 2001 it introduced a new regional development policy in an attempt to bring about a more even spatial pattern of economic opportunity throughout Mongolia.



Source: Mongolian National Statistical Office, and The World Bank Group, Ulaanbaatar, March 2002

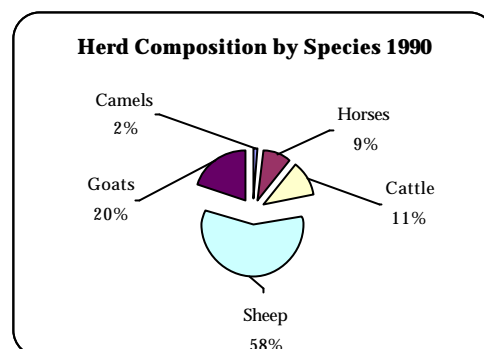
⁷ *Mongolia Participatory Living Standard Assessment 2000*, Ulaanbaatar: Mongolian National Statistical Office and the World Bank, 2001.

Issue in Focus

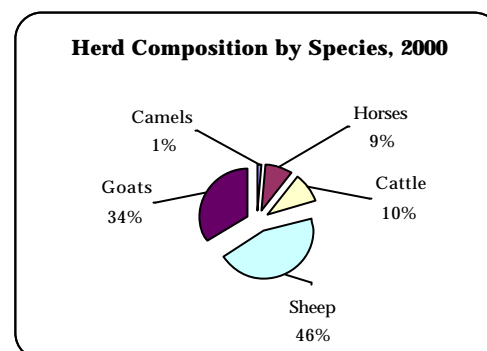
Livelihood and Livestock Change between 1999 and 2000

The species composition of the national herd has also changed as a result of new economic opportunities since the 1990s. Most notably, in direct response to higher, albeit fluctuating, world cashmere prices, goats have increased as a share of total livestock from 20 percent in 1990 to 34 percent in 2000. In a recent participatory assessment of changing living standards in which most people felt better off were those best placed to take advantage of cashmere trading opportunities along the Chinese border.⁸ An increase in the total number of goats has affected areas not previously associated with cashmere production (Northern Mongolia), and has come primarily at the expense of sheep stock, which declined from 58 percent of the national herd in 1990 to 46 percent in 2000.

The different species grazed in Mongolia are complementary in that each has a different food preference and style of eating, allowing a mixed herd to gain the maximum benefit from any area of grassland. Of the livestock species, goats are the most nimble and can feed in places inaccessible to other animals. Goats, however, also eat the widest range of food, thus endangering limited-range rock plants. Goats with their sharp hooves also cut through the cryptobiotic crust of fungi and other lower plants, that holds together the exposed soil in areas of sparse vegetation thus making the soil susceptible to wind erosion. It has been suggested that the recent severe spring dust storms might have been aggravated by the larger numbers of goats present across the Gobi region. Between 1990 and 2000, the relative shares of cattle and horses in the national herd oscillated minimally from 9 to 11 percent. However, losses of these large animals during the two consecutive dzud of 1999/2000 and 2000/2001 were much more significant than those of small ruminants.



Source: NSO. 2001. *Mongolian National Statistical Yearbook 2000*; Ulaanbaatar: National Statistical Office of Mongolia



Source: NSO. 2001. *Mongolian National Statistical Yearbook 2000*; Ulaanbaatar: National Statistical Office of Mongolia



Mongolian cashmere goats (Whitten, Fall 2001)

⁸ *Mongolia Participatory Living Standard Assessment 2000*, Ulaanbaatar: Mongolian National Statistical Office and the World Bank, 2001.

Issue in Focus

Livelihood and Livestock Change between 1999 and 2000

The Mongolian government is strengthening its efforts to support pastoral risk management. The long-term challenge is to broaden the assets of the rural poor by expanding the range of livelihood opportunities available to them. In addition, GoM aims to facilitate exit strategies for herders who have little prospect of achieving secure and sustainable livelihoods in the livestock sector. Experience from Mongolia's National Poverty Alleviation Program points to the importance of extending the outreach of micro-finance services to the rural poor in remote areas.

It is also crucial that the Government support rural communities to prioritize and manage needed investments in small-scale infrastructure such as wells, rural access roads, and health and education facilities. The Participatory Living Standards Assessment 2000 confirmed that rural communities in Mongolia would like to ensure that such infrastructure investments and forms of service provision remain compatible with mobile livestock production, which is widely recognized as the key to sustainability in pastureland use and management.

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 forms of dzud (white dzud). In situations where such precipitation is the primary source of drinking water for domestic livestock, the absence of snow or ice at winter pastures is also a type of dzud (black dzud). Since forage production on natural pasture 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.

Two consecutive dzud in 1999-2000 and 2000-2001, demonstrated to policy makers and international donors alike just how risky Mongolia's environment is for livestock production. The scale of the recent dzud events was unprecedented since the onset of economic transition, and they resulted in combined losses of over 7 million 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 have herds of less than this minimum threshold, and are highly vulnerable to the effects of drought and dzud.

The severe consequences of recent dzud owe as much to institutional failures as to Mongolia's harsh environment. While humanitarian assistance was essential to save both human lives and the 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.

Source: East Asia and Pacific Region, Rural Development and Natural Resources Sector Unit, The World Bank Group.

Blue Agenda Water Resources

Mongolia has more than 3,800 rivers and streams with regular run-off, creating a waterway network of 6,500 km. In addition, 3500 lakes, and 186 glaciers add up to a total surface water volume of 63 million cubic meters (m³).

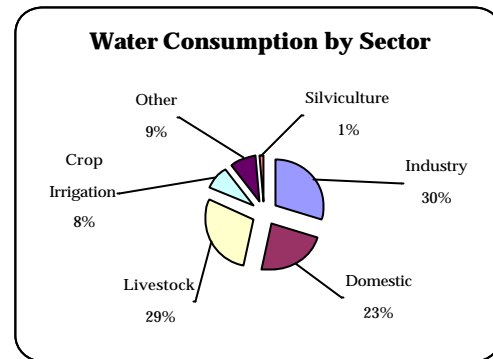
Despite such abundance, only half of the surface water resources are available for industrial, agricultural and human use, and they supply only 20 percent of the total water consumed. Groundwater is abundant and supplies 80 percent of total water consumed.

Although, per capita annual water availability is 17,300 m³, there is high variability across the regions in the country. The lowest per capita availability is in the Gobi area, with only 4,500 m³ available per person, whereas northern and central areas, have the highest per capita availability with 46,000 m³ per person.

Per capita water consumption is three to four times lower than the world average and the minimum daily consumption recommended by the World Health Organization. Although total consumption tripled between the 1960s and 1980s, it decreased by 25 percent between 1990 and 2000. The decline was a result of the economic recession following Transition.

Population pressures are responsible for declining water flows in the Tuul, Haraa, and Herlen rivers. Groundwater levels are also falling with increased use, thus causing some of the wells and springs to dry up completely, especially in March and April.

As much as 60 percent of groundwater abstraction for commercial use is carried out without the required permit and no metering system is in place to monitor withdrawal levels.



Source: Ministry of Nature and Environment; Ulaanbaatar, March 2002

In addition, abstraction for domestic use is uncontrolled and does not require Government permission.

Overall, half of the population living in *ger* areas⁹ faces water supply problems, and relies on water distributed by trucks and sold at kiosks and at neighborhood wells. Only 30 percent of the rural population has, in fact, access to a regular water supply. In addition, access to showers or bath houses is extremely limited.

Total water consumption is low due to irregular repairs and inadequate maintenance of municipal water supply lines. An estimated 30 percent of the water supply is lost *en route*; leaking taps and toilets bring the loss up to about 50 percent.

Expansion, renovation, and maintenance of the water supply network and facilities have been constrained by a lack of funding and skilled personnel. The integrated management of water resources is hampered by institutional fragmentation and the lack of water users' participation in the allocation of water rights among different user groups.

⁹ A ger is a typical circular, white felt tent; a ger area is a peri-urban, palisaded compound with a mixture of gers and wooden/brick buildings, with limited access to urban services.

Blue Agenda Water Resources Policy Responses

In 1995, GoM enacted the Water Law to address water resources management and recognize water as an economic good. In 1999, the National Water Policy Programme identified the basic strategic interventions

to address existing deficiencies in the management of natural resources. The National Water Committee is in charge of implementing this program.

A Decaying Irrigation System

The volume of water consumed for irrigation has fallen dramatically during the Transition. At the beginning of the 1990s, there were more than 140 irrigation systems, of which only 65 percent are now in working condition. No new systems have been put into place, and minimal or no repairs have been carried out due to the lack of capital and investments. Water supply facilities, machinery and equipment are badly worn out, causing substantial amounts of water to be wasted.

In addition, many of the wells used for water supply and livestock watering by herders are in disrepair. Only 40 percent of the existing 48,000 wells are currently functioning. There is concern that water shortages, resulting from the lack of proper maintenance and ownership of the irrigation systems and wells, may soon create serious economic problems in several regions throughout the country.

In 1999, GoM devised a plan for the introduction of water meters for irrigation in order to reduce water wastage and to raise revenues to finance operation and maintenance.

Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



Nomadic herders campsite in Southern Mongolia (Whitten, Fall 2001)

Brown Agenda Water Quality

Domestic sewage, industrial effluents, agricultural run-off, and untreated solid and dry waste are polluting surface and groundwater in Mongolia. In addition, improper storage and use of chemicals and fertilizers, and violations of regulations to protect sanitary zones further exacerbate the problem.

To date, 60 percent of the total population is served by the public water system, and 25 percent of it has access to sanitation. Most urban centers possess a centralized wastewater collection and treatment facility; however, the majority of this infrastructure is in poor condition and does not function at full capacity.

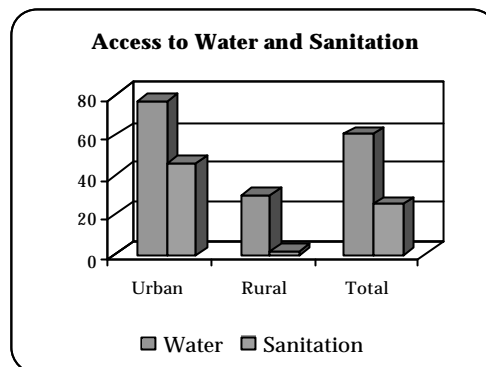
There is no sewerage or wastewater collection system in the *ger* areas. Each plot has pit latrines, which are usually crudely constructed, resulting in odors, flies, and possible ground water contamination.

The natural purifying capabilities of rivers in Mongolia are limited by seasonal variations in flow, and freezing winter temperatures.

The Terelj river, especially in its upper reaches, as well as the Tamir and Zelter rivers, are consistently rated Grade I with high levels of dissolved oxygen (DO).

The upper reaches of the Tuul river are rated Grade II, while its lower reaches are rated Grade IV attributable to the concentration of human and industrial activities around the Ulaanbaatar metropolitan area.

The Khangal river is also rated Grade IV due to its proximity to one of Mongolia's most significant copper mining and processing sites. The waters of these rivers have high or very high levels of biochemical oxygen demand (BOD) and total coliform bacteria (TCB).



Source: Ministry of Nature and Environment, Ulaanbaatar, October 2001

The water quality of the Orkhon river, which passes through mining and logging areas, the Kherlen river near Baganuur, the country's largest supplier of lignite coal, and the Kharaa river near Darkhan have deteriorated over time. With increasing BOD, heavy metals concentrations, and decreasing DO, these rivers are rated Grade III.

In the past 10 years, the quantity and quality of groundwater have also been adversely affected by pollution. Increasing groundwater use and slow or declining aquifer recharge have led to saline intrusion and pollution of groundwater from domestic sewage, factory waste and agricultural chemicals.

Water quality monitoring is extremely limited or non-existent in many parts of the country, and adequate wastewater collection and treatment systems are lacking, thus posing a significant health threat.

Brown Agenda

Water Quality Policy Responses

The Government is moving to incorporate the 'polluter-pays-principle' into its policies. The 'Law on Wastewater Discharges Fee' is awaiting Parliamentary approval.

Over the past five years, several development programs have rehabilitated and upgraded the infrastructure for water supply and sanitation in an attempt to improve service delivery throughout the country.

National water quality standards for both rural and urban water supply are being reviewed, and equipment and training for water quality testing are being updated. The Government has also developed the Tuul river 'Pollution Mitigation Action Plan' to assess the river's pollution, and design and implement pollution mitigation activities.

In addition, GoM is undertaking a water sector review to assess:

- to which extent the legal framework enables the development of an efficient and sustainable supply of water;
- the possibility of Implementing a national program to ensure equitable distribution of and reasonable pricing of water; and
- The feasibility of managing water exploitation in an integrated manner.

Surface Water Classification

In 1989, GoM established a five-grade classification system to characterize the quality of surface water. Several indices of oxygen condition, mineral composition, organic pollution, biological contamination, and toxicity determine the purity grades.

Grade I-Extra clean fresh surface water resources used for:

1. Conservation, not required to pass through water treatment process. Only ordinary processing for pathogenic destruction needed;
2. ecosystem conservation where basic organisms can breed naturally.

Grade II: Very clean fresh surface water resources used for:

1. Consumption, which requires ordinary water treatment processes before use;
2. Aquatic organisms conservation, fisheries, and recreation.

Grade III: Medium clean fresh water resources used for:

1. Consumption after ordinary treatment;
2. Agriculture.

Grade IV: Minimally clean freshwater resources used for:

1. Consumption after special treatment;
2. Industry.

Grade V: Polluted freshwater resources can be used only for navigation.

To date, only the *Khangal, Kharaa, Kherlen, Orkhon, Tamir, Terelj, Tuul, and Zelter* rivers have been classified. However the water quality is not systematically monitored.

Source: Ministry of Nature and Environment, 1997

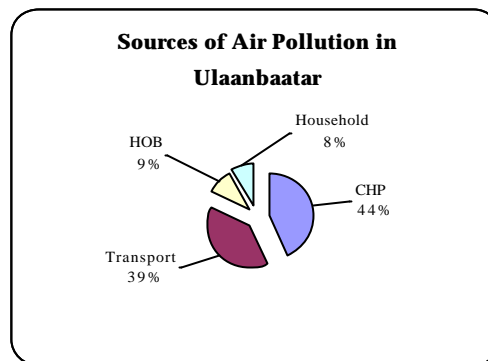
Brown Agenda Air Quality

Air pollution in Mongolian urban areas has been deteriorating over the past 10 years. Some 5.7 million tonnes of coal and 160 m³ tonnes of wood, which are used for energy generation, heating and cooking every year, are responsible for the increasing levels of air pollution.

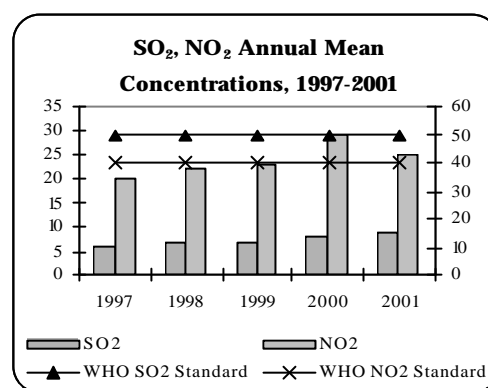
There are four air quality monitoring stations in Ulaanbaatar. They indicate that between 1994 and 2000, mean annual concentrations of SO₂ and NO₂ have risen. SO₂ concentrations have risen from 4 µg/m³ to 9 µg/m³, and NO₂ concentrations from 14 µg/m³ to 25 µg/m³.

Concentrations of SO₂ are higher between October and March due to increased emissions from local heating sources and electricity generation. In these months, peak SO₂ concentrations of 45 µg/m³ have been recorded in the evenings between 4 pm and 8 pm. These peaks are more than double the mean annual concentration. There is some concern that at the current rate of growth, these peak concentrations will soon be above the stipulated standards. Due to a doubling of the total number of cars, since 1990, higher concentrations of NO₂ have recently been observed along the main roads and at traffic intersections. However, these concentrations are still below the national standard.

Dust storms, caused by strong winds picking up soil, are especially common in April. This is aggravated by anthropogenic and natural land degradation. Nowadays, there are four time as many dust storm days in Ulaanbaatar as there were in 1960.



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002

Recent studies have shown that there is a significant correlation between increased air pollution and acute respiratory infections among children¹⁰. Respiratory diseases among children under five years of age are two to three times higher in Ulaanbaatar than in rural areas.

¹⁰ M. Erdenetuya and R. Erdenechimeg. -Mongolian Climate and Children Health-, Ministry of Nature and the Environment; Annual Report for 2000; Ulaanbaatar, 2000.

Brown Agenda Air Quality Policy Responses

In 1995, the Parliament ratified the Law on Air, and in 1996, GoM developed the Action Program to Protect Air, which identified Mongolia's priorities for air pollution monitoring and management in different sectors of the economy.

Since 1997, GoM has been working to develop an integrated air pollution management program for Ulaanbaatar. The following are among the main features of this program: a switch to cleaner fuels; market-based measures; regulatory incentives to energy producers; incentives to the private sector and to consumers for energy efficient investments; enhanced monitoring and enforcing capacity; and improved traffic management.

The Improved Urban Stoves Project

Ulaanbaatar is the coldest capital in the world, and urban Mongolians use inefficient and polluting coal stoves for cooking and for heating their homes. As a result, smoke from approximately 70,000 coal stoves is a major cause of respiratory complaints and diseases. Indeed, Mongolia has one of the highest green house gas emissions per capita (over GDP) in the world.

The Improved Urban Stoves project, funded with a \$750,000 grant from the GEF, is seeking to reduce coal fuel consumption in the *ger* areas. It is facilitating the creation of a market-based system that would encourage the manufacturing and marketing of efficient indoor coal stoves, and the development of small, private energy service providers. The project aims to apply its lessons to other areas in Mongolia, particularly provincial capitals.

Source: Environment and Social Development Unit, East Asia and Pacific Region, The World Bank, March 2002



Grey and hazy sky over Ulaanbaatar (Whitten, Winter 2001)

Brown Agenda

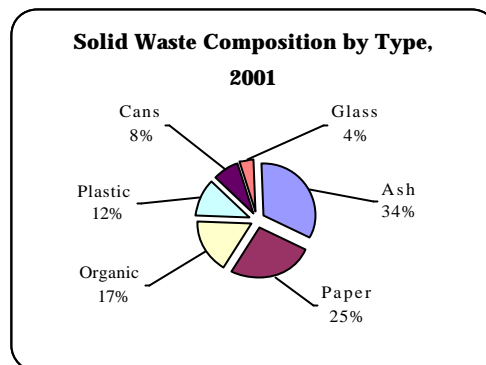
Solid and Hazardous Waste

Increased migration from rural areas to Ulaanbaatar and the accelerated growth of secondary cities have made solid waste a serious source of pollution in urban areas. Ulaanbaatar produces an average of 600 thousand m³ of solid waste annually. Only 30 percent of this waste is collected, and 40 percent of households have access to solid waste collection services.

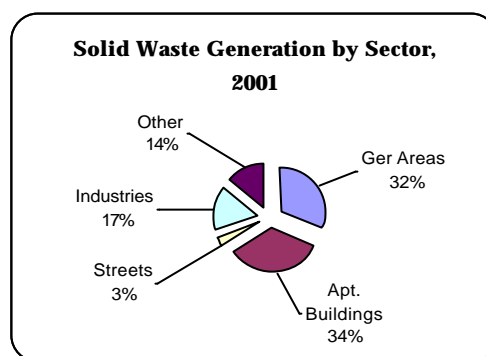
In multi-storied buildings, solid waste is deposited in a room on the ground floor and collected by waste management companies. In lower buildings, community bins are available for each block. Whereas solid waste is meant to be collected twice a week, it is often collected only once a week, thus causing serious odor and cleanliness problems.

In *ger* areas, solid waste is deposited in a designated open space and collected on a monthly basis, unless road access is limited. A majority of the roads are in poor condition, due to erosion, or have such steep slopes that garbage trucks encounter difficulties in collecting waste. As a result, individuals dump all waste in the nearest ravine. Coal ash from stoves makes up more than half of this waste and represents an increasing air pollution concern.

There are 447 waste collection points throughout the country, of which 220 are in Ulaanbaatar. However, waste collection and disposal are not well organized. Since there is no sanitary landfill, solid waste accumulates in heaps on the outskirts of cities and other populated areas before being transferred to one of the three open dumpsites. Until 1990, open burning was a common disposal method. Although declining air quality has induced people to limit this practice, open burning of garbage is still used to reduce garbage volume, or by scavengers in search of heat during the winter.



Source: Ministry of Nature and Environment, Ulaanbaatar; October 2001



Source: Ministry of Nature and Environment, Ulaanbaatar; October 2001

There are no separate facilities for the disposal of hospital waste. Therefore, it is burned openly in special sections of the dumpsites. This practice poses a health hazard and results in groundwater pollution and soil contamination.

Toxic waste management is also poor. Some 20 percent of toxic waste is stored in non-standard storage facilities, while another 20 percent is stored in open sites. As no health and environment risk classification system currently exist for transporting, handling, and storing toxic waste, concerns are increasing about possible water pollution and soil contamination resulting from inappropriate management and disposal of toxic waste.

Brown Agenda

Solid and Hazardous Waste Policy Responses

The Government's recently adopted 'Solid Waste Generation Reduction Program', is currently under implementation in several municipalities and provinces.

A license system to register open dumps has also been established and several illegal dumpsites throughout the country have been closed. In addition, GoM is exploring the economic feasibility of garbage recycling since 70 to 80 percent of solid waste is potentially recyclable.

Following the ratification of the *Basel Convention on the control of 'Transboundary Movements of Hazardous Wastes'*, GoM has developed a database for the registration and classification of toxic and chemical substances, and is in the process of drafting a law on toxic and hazardous wastes.



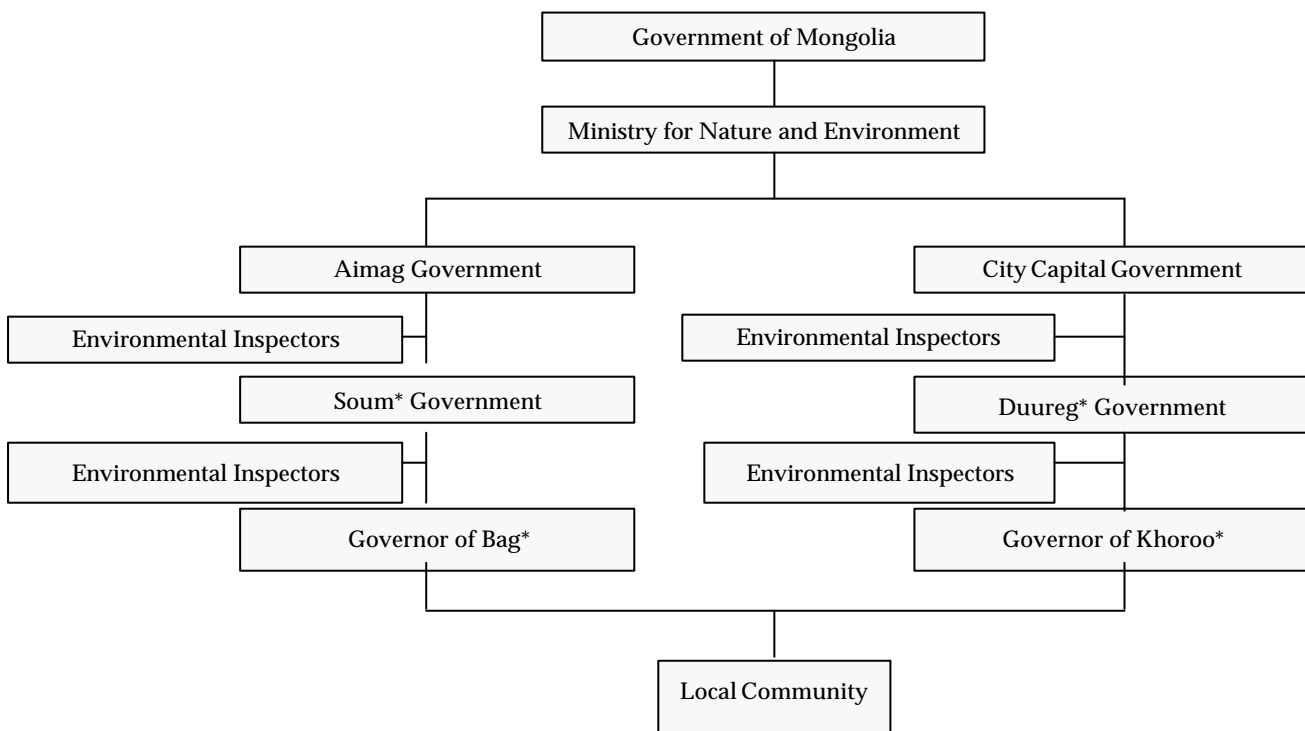
Sand dunes in the Southern Gobi region (Whitten, Fall 2001)

Environmental Institutions

The Ministry for Nature and Environment was established in 1992. It is responsible for the development and implementation of environmental policy and laws, regulating the use of natural resources and designing programs for environmental restoration. The Ministry is responsible for the following environmental issues: land management; water resources and quality; forest and reforestation; ecological diversity (flora and fauna); special protected area management; air and environmental monitoring; and management of natural disasters.

In 1998, MNE was reorganized to create a more decentralized structure. Local governors at the aimag, capital soum, duureg, khoroo and bag levels are responsible for the implementation of environmental legislation; development of guidelines for the use of natural resources; monitoring of environmental standards; enforcement of environmental regulations; and provision of information and data to the central administration about local environmental conditions.

Institutional Structure of the Environment Sector



Source: Ministry of Nature and Environment, Ulaanbaatar, March 2002

*Soum = district in rural areas;

*Bag = sub-district in rural areas;

*Duureg = district in urban areas;

*Khoroo = sub-district in urban areas;

See also *Mongolia at a Glance*

Environmental Institutions

MNE remains the driving force for formulating environmental and natural resources management policy and implementing necessary measures. However, other branches of the Government have some overlapping responsibilities. For example, the Ministry of Health is also responsible for setting emissions standards for air pollutants, and for measuring air pollution and its impacts on health. The Ministry of Education, Culture and Science shares the responsibility for drafting and implementing environmental education and public awareness programs. The Ministry of Industry and Trade is responsible for the development of the commercial timber industry.

Overall, coordination among ministries and government agencies remains limited, with no systematic dialogue nor formal communication or feedback on sectoral issues. In spite of a staff of 3,900 employees currently working for MNE at national and local level, human and financial capacity seem to be inadequate for the existing implementation, monitoring and enforcement responsibilities of MNE. In addition, the continuing loss of professional staff to the private sector further exacerbates this problem. Moreover, environmental agencies at aimag, soum and bag levels have weak administrative structures, and coordination with the national authorities on overall policy direction is carried out on an ad-hoc basis.

Through the endorsement of the *Millennium Development Goals*, MNE has renewed its commitment to broaden opportunities for civil society and NGO participation in environmental management, and to strengthen local governments' capabilities to fulfill their roles in environmental management.

Environmental Public Awareness

The citizens of Mongolia are becoming increasingly aware of the deteriorating environmental conditions in their country. However, the knowledge and understanding of the root causes of the current environmental degradation are still limited, thus preventing the public from playing a more active role in managing and protecting natural resources.

In 1995, GoM and the Soros Foundation, started a distance learning program on economic and social impacts of current environmental problems for university lecturers and students, and secondary school teachers. In 1997, GoM adopted the 'National Programme for Public Environmental Education', and established the National Council to organize the program activities, including the broadcast of a series of environmental documentaries on national television. In 1999, MNE and the Ministry of Education, Culture and Science, established the Ecological Training Center to develop environmental and ecological curricula. They also published a basic ecology textbook to provide guidance for ecological and environmental education.

Within MNE, a Civil Society Committee has been established to ensure that public opinion is taken into account in crucial environmental decision making, and to coordinate public participation activities between government agencies and NGOs at local and national levels. An information unit was also recently formed to facilitate the dissemination of environment-related information and to educate people on environmental laws and regulations. More than 40 environmental NGOs have emerged over the past 10 years, and about thirty of them formed the Union of Mongolian Environmental NGOs in 1999.

An environmental information column also is published in the *Daily News*, and the *Ecological Guard* is broadcast regularly on national public radio.

Source: Ministry of Nature and Environment, Ulaanbaata, March 2002

Environmental Legislation

The 1992 Constitution of Mongolia (Article 16) recognizes the basic human right of Mongolians to live in a clean and healthy environment. The 'Mongolia National Security Policy Orientation', the 'National Development Strategy', and the 'Ecological Policy Orientation of the Mongolian State', reinforce Article 16 of the Constitution, and establish the basic principles for protecting the environment and natural resources.

In 1995, a set of 14 environmental laws was adopted to update and enhance the existing legislation. These laws were to reflect the new structure of environmental institutions in the country, and recent international environmental legislation. The 1995 laws extended protection of natural resources, and provided increased environmental regulations. They also introduced monitoring, record-keeping, information sharing, and user-fees regulations as a starting point to address the needs of a market economy.

Key Environmental Laws

- Law on Protection of Livestock Genetic Fund and Health, 1994
- Law on Underground Resources, 1994
- Law on Air, 1995
- Law on Environmental Protection, 1995
- Law on Forests, 1995
- Law on Protection from Toxic Chemicals, 1995
- Law on Hunting, 1995
- Law on Land, 1995
- Law on Mineral Resources, 1995
- Law on Natural Plants, 1995
- Law on Payments for use of Water, Forest, Natural Resources; 1995
- Law on Special Protected Areas, 1995
- Law on Water, 1995
- Law on Protection against Forest and Steppe Fires, 1996
- Law on Buffer Zones of Protected Areas, 1997
- Law on Meteorological Forecasting, 1997
- Law on Environmental Impact Assessment, 1998
- Law on Land Cadastre, 1999

Source: Ministry of Nature and Environment, Ulanbataar, 2001

Environmental Impact Assessment Procedures

In 1998, the Mongolian Parliament passed the first Environmental Impact Assessment (EIA) Law to regulate environmental impact assessment and decision-making on the implementation of development projects. The Law requires environmental screening for each proposed development project before it is implemented, to determine the appropriate type of EIA, and its extent. The general assessment is completed by EIA officers at the national (within the MNE), aimag (one EIA officer and inspector) and soum (one EIA officer) levels. The EIA reports are prepared by private companies, certified by MNE to conduct EIAs. As a result of the screening assessment, MNE and/or the local government authorities decide whether the proposed development project needs a partial or full EIA; specifically (i) If the project's impact meets existing environmental standards and requirements, approval is provided without the need for further assessment; (ii) If the project's negative impact is unlikely and/or insignificant approval is subject to special conditions; (iii) If the project's negative impact is likely and/or significant, a detailed environmental assessment is required.

EIAs of type I and II are to be reviewed at the local level (aimag, soum). Type III are reviewed by national EIA officers and, whenever possible, are also reviewed at the local level. For mining projects, the EIA Law specifically requires that provisions for an environmental management plan (EMP) be included in the project proposal. In addition, it specifies that half of the estimated cost of the EMP be given, in advance, to the local government authorities in the form of a bond. The remaining 50 percent of the cost of the EMP is to be paid during the project implementation phase. In 1999, recognizing the need for better implementation and control over EIAs, the Government organized a countrywide training exercise for EIA officials. No other updating or training exercise has been organized since then. However, GoM is currently undertaking a review of the 1998 EIA Law to improve its effectiveness.

Source: Ministry of Nature and Environment, Ulaanbaatar, 1998

Environmental Legislation

Several national programs such as the 'Mongolian Action Program for the 21st Century' (MAP-21), the 'Plan for Environmental Awareness' and those aimed to combat desertification, conserve biodiversity, protect forests and reduce waste, have also been developed and are under implementation.

Between 1997 and 2000, new environmental laws were passed such as the 'National State Policy on Environment', the 'Law on the Ratio of the Income from Natural Resources Use Payments to be Spent for Environmental Protection', and the 'Natural Resource Restoration Law'. The new laws were meant to address the weaknesses that emerged from the environmental laws passed in 1995. These laws call for stricter implementation of environmental legislation, the introduction of clear and strict administrative and civic liability, and the development of a legal, economic and institutional environment for the sustainable use of natural resources.

Issues surrounding the development of legislation on land privatization, waste management, emissions standards, biodiversity conservation, natural disasters, and the revision of administrative liabilities remain unresolved.

Implementation and enforcement of these laws remain poor. Limited availability of financial resources, and absence of implementing guidelines for monitoring and inspection procedures, hamper local government agencies in executing legislated roles. In addition, inadequate monitoring of natural resources use, and limited public awareness and understanding of environmental laws and regulations have led to poor implementation of existing legislation.

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. This policy document that addresses 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, adopted in 1995, are in line with the priorities set in the Good Governance for Human Security Programme. The actions and objectives of the NEAP have also been incorporated into the Good Governance for Human Security 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, Ulaanbaator

Environmental Expenditures

Through its departments and agencies, the MNE manages budget allocations for environmental quality management, natural resources management, research and development, and support for water supplies¹¹.

Expenses to recover from forest fires pertain to the Ministry of Defense Affairs and Services and are based on the occurrence of fires throughout the country.

The data for environmental expenditures by line agencies –other than those in MNE– is limited; this indicates that mainstreaming of environmental management is also limited. The majority of expenditure by environmental agencies pertains to ‘pure’ environmental management activities¹². Environmental units in line agencies participate in a very limited way in operationalizing these activities.

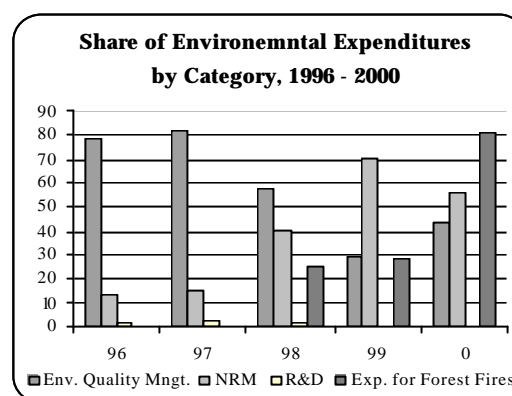
Between fiscal 1996-2000¹³, the total budget allocation for environmental expenditures benefited from an average annual increase of 33 percent –from 1,315 million Tögrögs in 1996 to 5,309 million Tögrögs in 2000¹⁴. This upward trend was reversed only in 1999, when the budget allocation suffered a 48 percent cut.

The decline of environmental expenditure occurred during a period of economic recession, when overall government spending contracted. However, the drop in environmental expenditures was more rapid, and stretched across a longer period of time.

1996 – 2000 Environmental Expenditures

	1996	1997	1998	1999	2000
Total E. E. (Millions of Tögrögs)	1.31	1.39	3.46	2.34	5.30
E. E. as % of GDP	0.2	0.17	0.42	0.27	0.5
Per capita E.E. (US\$)	0.53	0.56	1.13	0.63	1.48

Source: Ministry of Finance Statistics, Ulaanbataar, October 2001



Source: Ministry of Nature and Environment, Ulaanbataar, October 2001

Between fiscal 1996 and 2000, on average, 58 percent of the total budget was allocated to MNE for management of environmental quality, 39 percent for management of natural resources, and 2 percent for research and development. Expenditure allocation among these three categories varied significantly from year to year. They showed a downward trend for management of environmental quality and research and development, and an upward trend for management of natural resources and ‘expenditure to recover from forest fires’.

These trends were a result of the efforts of GoM to strike a balance between the expenditures for the ‘Brown’ and ‘Green’ sector since issues in both categories were among the most pressing environmental problems for Mongolia.

¹¹ Agencies include: Information Agency, Monitoring and Environmental Assessment Department; Policy Implementation Department; Land Authority; International Cooperation and Information Department.

¹² ‘Pure’ environment management activities include: environmental assessment, and environmental monitoring and enforcement of environmental standards and regulations.

¹³ The fiscal year runs from January 1 to December 31.

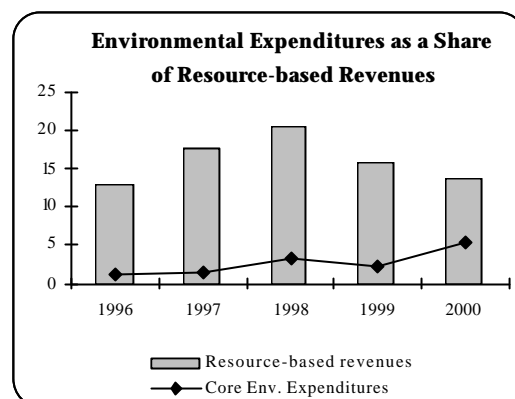
¹⁴ In 1996, the exchange rate was 997.24 Tögrögs for US\$ 1; in 2000, 1429.29 Tögrögs for US\$ 1. *International Financial Statistics, Yearbook 2002*; IMF.

Environmental Expenditures

Between fiscal 1996 and 1998, GoM budget allocation for industrial pollution control only covered 30 percent of the total expenditures; since 1998, there has been no government allocation for industrial pollution abatement since 1998. However, the private sector and bilateral donors have provided, at least, portions of the funding needed.

Despite the fact that it has been identified as one of the main environmental issues, solid waste management did not receive any budget allocation, at national level, for the period 1996-2000. In 2000, due to the seriousness of the solid waste problem, the international donor community made available 1,194 million Tögrögs, in the form of grants, to GoM.

Revenues from natural resources are particularly important in the GoM budget. Between 1996 and 2000, revenues from natural resources contributed on average 2 percent of GDP, while the average environmental expenditures as a share of GDP was 0.3 percent, and accounted for only 17 percent, on average, of total resource-based revenues.



Source: Ministry of Finance, Ulaanbaatar, October 2001

Detailed information on environmental expenditures in the development budget is very limited, since the data from the Ministry of Finance only reflects development programs, and does not include individual projects within those programs. The only available data pertains to investments in the forestry sector, which registered a 20 percent increase from 109 million Tögrögs in 1996 to 540 million Tögrögs in 2000.

Donor Assistance

The Ministry of Nature and Environment is the main recipient of official development assistance for environmental initiatives in Mongolia.

The main donors include ADB, AusAid, CIDA, DANIDA, GEF, GTZ, Government of New Zealand, JBIC, UNDP USAID, and the World Bank. Between 1993 and 1999, bilateral and multilateral donor assistance for environmental initiatives came as grants totaling US\$ 20 million.

The most active environmental donor is UNDP. It supported the preparation of 'MAP-21', and initiatives addressing reforestation and management of natural disasters, energy efficiency, and accounting of ozone-depleting substances.

In partnership with the Danish and Dutch Governments, UNDP designed the management plan for water quality improvement in the Tuul river. GEF supported a vulnerability and impact assessment of climate change, and managing of the Eastern Steppes Biodiversity Project (US\$ 9.8 million), which is the largest Mongolian environmental project.

CIDA/IDRC assisted economic valuation of natural resources and environmental costs. In addition to supporting the reintroduction of the Przewalski horse to a nature reserve to the west of Ulaanbaatar, the Dutch government is also funding a program to raise public awareness of environmental issues.

The first Technical Assistance project to strengthen environmental management skills in MNE was financed by the ADB in 1995, and is now directing its support to improving urban environmental services in poor *ger* areas.

Management of buffer zones around protected areas in Khentii and the Gobi, and integrated fire management for the Khentii forests are supported by GTZ.

JICA is funding projects addressing wastewater and solid waste management. It also provided pollution abatement equipment for the coal-fired power stations in Ulaanbaatar. USAID supports alternative energy development

The World Bank funded the 1995 and the 2002 NEAPs, and assisted in developing sectoral environmental assessment and green accounting. Through projects in the finance, transport, and rural sectors it helped in establishing the environmental assessment process.

The WB is providing assistance to GoM to develop a weather-based, commercially viable approach to livestock insurance. With GEF support, the World Bank is managing a project promoting energy-efficient urban stoves, a review of biodiversity capacity, and a research project in the Lake Khovsgol National Park investigating the interactions between permafrost melt and the loss of biodiversity.

Glossary of Environmental Terms

Air Quality Standards: The level of pollutants prescribed by regulations that are not to be exceeded during a given time in a defined area.

Aridity: Permanent feature of the climate present in areas, other than polar and sub-polar regions, in which the ratio of annual precipitation to potential evapotranspiration falls within the range from 0.05 to 0.65.

Biochemical Oxygen Demand (BOD): The amount of oxygen consumed in the biological processes that break down organic matter in water. The greater the BOD, the greater the degree of organic pollution.

Biodiversity: Refers to the variety and variability among living organisms and the ecological complexes in which they occur. It encompasses different ecosystems, species, and genes.

Blue Agenda: Refers to all forms of aquatic and water resources.

Brown Agenda: Describes the pollution caused by industrial, urban, transport and energy sources and their single or collective impacts, and protection measures.

Climate Change (also referred to as global climate change): Used to imply a significant change from one climatic condition to another. In some cases, 'climate change' has been used synonymously with the term, 'global warming'; scientists however, tend to use the term in the wider sense to also include natural changes in climate.

Dissolved Oxygen (DO): The oxygen freely available in water, vital to fish and other aquatic life and for the prevention of odors. DO levels are considered the most important indicator of a water body's ability to support desirable aquatic life. Secondary and advanced wastewater treatments are generally designed to ensure adequate DO in waste-receiving waters.

Desert: Region that receives less than 25 cm of rain a year, on average. Deserts are mainly found around the Tropic of Cancer and Tropic of Capricorn in the Northern and Southern Hemispheres respectively.

Drought: The naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

Dryland: Arid, semi-arid and dry sub-humid ecosystems, which are characterized by low and/or irregular rainfall and high evapotranspiration and are subject to cyclical droughts.

Effluent: Wastewater—treated or untreated—that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Endangered Species: Animals, birds, fish, plants, or other living organisms threatened with extinction by anthropogenic (man-caused) or other natural changes in their environment.

Grassland: Open and continuous areas comprising many different kinds of grasses.

Green Agenda: Describes environmental impacts caused by agriculture, deforestation, land conversion and destruction of protected species.

Habitat: The place where a population (human, animal, plant, microorganism) lives, and its surroundings, both living and non-living.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed.

Landfill: Disposal site for non-hazardous solid wastes spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.

Glossary of Environmental Terms

Nitrogen Dioxide (NO₂): The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog

Pesticide: Substances or mixture thereof intended for preventing, destroying, repelling, or mitigating any pest. Also, any substance or mixture intended for use as a plant regulator, defoliant, or desiccant.

Pollutant: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.

Protected Areas: An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

Rangeland: Ecosystems dominated by grasses, grass-like plants, forbs, or shrubs and dominated by herbivores.

Run-Off: That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water. It can carry pollutants from the air and land into receiving waters.

Salinization/Saline Intrusion: The invasion of fresh surface or ground water by salt water.

Saxaul: drought resistant shrub/small tree found in the desert regions of central Asia.

Sewage: The waste and wastewater produced by residential and commercial sources and discharged into sewers.

Soil Erosion: The wearing away of land surface by water, intensified by land-clearing practices related to farming, residential or industrial development, road building, mining, or logging.

Solid Waste: Non-liquid, non-soluble materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

Steppe: an arid grass plain.

Sulfur Dioxide (SO₂): A heavy, pungent, colorless, gaseous air pollutant formed primarily by processes involving fossil fuel combustion.

Total Coliform Bacteria: A collection of relatively harmless microorganisms that live in large numbers in the intestines of man and warm- and cold-blooded animals. A specific subgroup of this collection is the fecal coliform bacteria, whose presence in aquatic environments indicates that the water has been contaminated with the human or animal fecal material.

Water Quality Standards: The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses.

Source : United States Environmental Protection Agency's "Terms of the Environment", revised December 1997; and UNDP Dryland Web - Office to Combat Desertification and Drought

Mongolia at a Glance

Geography	Economy and Society								
<p>Location: Northern Asia, between China and Russia</p> <p>Total area: 1.565 million sq. km</p> <p>Land boundaries:Total:8,161.9 Km</p> <p>Border countries: China 4,676.9 km Russia 3,485 km</p> <p>Elevation extremes: Lowest point: Khoh Nuur 518 m; Highest point: Nayramadlin Orgil 4,374 m</p> <p>Mineral resources: oil, coal, copper, molybdenum, tungsten, phosphates, tin, nickel, zinc, gold, silver, iron</p> <p>Land use:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">arable land:</td> <td>5.7 percent</td> </tr> <tr> <td>permanent pastures:</td> <td>81 percent</td> </tr> <tr> <td>forest and woodlands:</td> <td>11.4 percent</td> </tr> <tr> <td>other:</td> <td>1.9 percent (2000 est.)</td> </tr> </table> <p>Irrigated land: 800 sq km (1993 est.)</p> <p>Climate: continental (large daily and seasonal temperature ranges)</p> <p>National capital: Ulaanbaatar</p> <p>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.</p> <p>Fiscal Year: January 1st – December 31st</p> <p>Independence: 11 July 1921 (from China)</p>	arable land:	5.7 percent	permanent pastures:	81 percent	forest and woodlands:	11.4 percent	other:	1.9 percent (2000 est.)	<p>GDP: US\$ 4.7 billion (2000 est.)</p> <p>GDP growth rate:1 percent (2000 est.)</p> <p>GDP composition by sector: Agriculture: 36 percent Industry: 22 percent Services: . 42 percent (2000 est.)</p> <p>Currency: Tögrög; US 1 = 1,097 Tögrög</p> <p>Inflation rate: 7r: \$200 million (1998 est.)</p> <p>Industrial production growth rate: 2.4% (2000 est.)</p> <p>Agriculture products: wheat, barley, potatoes, forage crops; sheep, goats, cattle, camels, horses</p> <p>Exports total value: \$454.3 million (f.o.b., 1999)</p> <p>Export partners: China 60%, US 20%, Russia 9%, Japan 2% (2000 est.)</p> <p>Imports-Total value: \$510.7 million (c.i.f., 1999)</p> <p>Import Partners: Russia 33%, China 21%, Japan 12%, South Korea 10%, US 4% (1999)</p> <p>Population, mid-year: 2,654,999 (2001 est.)</p> <p>Population growth rate: 1.4 percent (2001 est.)</p> <p>Poverty (percent below poverty line): 40 (2000 est.)</p> <p>Birth rate: 21.8 births/1,000 population (2001 est.)</p> <p>Death rate: 7.1 deaths/1,000 population (2001 est.)</p> <p>Infant mortality rate: 53.5 deaths/1,000 live births (2001 est.)</p> <p>Life expectancy at birth: 64 years</p> <p>Access to safe water: 60 % of total population</p> <p>Access to sanitation: 25 % of total population</p> <p>Literacy (at age 15) total population: 97%</p>
arable land:	5.7 percent								
permanent pastures:	81 percent								
forest and woodlands:	11.4 percent								
other:	1.9 percent (2000 est.)								

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