

and using its resources in a sustainable manner, is conserving territory under protection. Issues of special protected areas have become the focus of nature protection policies in many countries, and protected areas have become the most appropriate way of protecting the nature, natural and cultural heritage of countries throughout the world. Natural protection and the appropriate use of natural resources is the basis for creating sustainable development and ecological security conditions in Mongolia. The classification and basis for legal frameworks relating to Special Protected Areas (SPAs) have been established since 1990, and contain 4 categories of SPA classification and elaborate a rule of activities that were approved by the 217th order of the Government in 1991. This rule was re-worked by the Ministry for Nature and Environment as a bill of SPA and was passed by the Parliament in 1994. The third clause of this law stipulates that there are 4 categories of SPA: Strictly Protected Areas, National Conservation Parks, Nature Reserves and Monuments (Law of Special Protected Areas – 1994).

Thus, due to the above policy-driven measures from the State and the Government, 16.0% - or more than 73 areas covering 25.0 million hectares of whole territory - has been taken under State special protection and is classified as follows: 48.21% or 12 Strictly Protected Areas, 42.16% or 22 National Conservation parks, 9.16% or 19 Nature Reserves and 0.47% or 8 Monuments.

Strictly Protected Areas

The Law of Mongolia on Special Protected Areas states that 'Strictly Protected Area' means an area taken under special protection of the State in order to ensure the ecological balance for peculiar features of its natural zones and belts, its state of originality and outstanding scientific significance.

A Strictly Protected Area is the highest form of taking a territory under special protection and it aims to keep the wilderness of nature in its original formation, studying the natural phenomena and processes in its evolution. It is the principal method of protecting the environment on a scientific basis. Internal zoning is very important for scientifically organizing the protection of Strictly Protected Areas. Three zones, namely: pristine zones, conservation zones and limited use zones are created in Strictly Protected Areas and establish protection regimes for each zone and the regimes are being followed.

National Conservation Park

This is an area taken under special protection of the State which has relatively conserved its natural original state and importance for historical, cultural and scientific knowledge, and ecological education. It is not necessary to consider the natural complexity or peculiarity of landscapes when selecting National Conservation Parks, nor to select areas in which it is possible to develop recreation, tours and tourism. The size of the natural complex area can comparatively be large. Three zones, namely: special zones, tourism zones and limited use zones are created in National Conservation Parks.

Nature Reserve

Areas classified as Nature Reserves under the SPA aim to protect certain resources, reclaim and keep the balance of ecology. 'Nature Reserve' means an area taken under State special protection to protect certain types of nature, to protect and conserve resources, and to facilitate reclamation. Traditional economic activities may be conducted in a Nature Reserve without negative impacts on the type of nature, view of certain resources, location, growth and reproduction of flora and fauna. 'Nature Reserve' is a mobile classification and its peculiarity is that it can be changed to a more appropriate classification after a certain period of time and reclamation.

Monuments

These are areas which are taken under special protection of the State to preserve unique natural formations and the historical and cultural traces in their original conditions. Natural monuments are classified in two categories: natural monuments and historical and cultural monuments. Natural Monuments may include areas with unique formations and outcrops, waterfalls, cliffs, canyons, caves, rocks, groves, mineral springs, oases, dunes, meteors, meteor craters and volcano craters. Historical and Cultural Monuments include the dwellings of ancient people, caves, cave paintings, rock in scripts, monuments, toms, ruins, walls, castles, canals, dams, ancient mines, and mountains related to traditional rituals and worshipped, or historical places.

2. Regulations and Laws relating to Protected Areas.

The specific advantage of extending State protection to natural sightseeing with ecological high importance is to protect any flora and

fauna together with their living environment as an ecosystem complex, and to ensure that the ecological balance is not lost in certain areas nor at a regional level.

The basis of the State united system, solely responsible for SPA issues, was created by forming a State Service for Natural Complex Areas and Eco-tourism that affiliated to the Ministry for Nature & the Environment (MNE) in 1992, by an order of the Minister for Nature and the Environment.

In 2000, responsibility for the SPA was shifted to the Bureau of SPA Administration of the MNE by the 131st order of the Government and this bureau was extended to the Department of Special Protected Area Management (DSPAM) of MNE by the 236th and 36th orders of the Government in 2004 & 2006 respectively. The DSPAM is responsible for creating a legal environment for protecting SPA, extending the network of SPA, achieving international standards of organization, management, human resources, equipment and supply etc. for meeting contemporary requirements.

Issues of territory special protection are reflected in state and government strategic policy documents such as “Concept of National Security”, “State Policy on Ecology”, “National Programme on SPA” and the Government Action plans, and these are being materialized.

Natural zones and belts of our country are included in the state SPA as the following: 8.1% of high mountain zones, 15.2% of forest-steppe zones, 34.2% of steppe zones, 23.4% of desert-steppes, 19.1% of desert zones, and more than 40% of areas of rare and endangered flora and fauna, 17% of forest funds, and around 70% of areas of inhabitants that are registered in the ‘Red book’

3. Governance of each type of PA

At present, 24 protected area administrations have been established and are operational. They are responsible for providing special protected and local protected areas with protection and expertise management, and more than 400 people work in these administrations. Of these, 25% are administration experts, 59% are rangers and 12% are service staff.

Almost all protected area administrations have their own offices and are supplied with new vehicles and equipped with other required technical tools and equipment and their material bases are being strengthened. Big successes were made in these areas between 2006-2010. For instance, over 1.8 million hectares of territory were included in the SPA network by the resolution of the Parliament. During this period, research and study was conducted to take 3 areas of 800 thousand hectares that comprise territories of 4 aimags (provinces) under special protection. 6 newly-established special protected area administrations changed the size of their area to be protected by a wildlife ranger and it was approved by 87th resolution of the Government of Mongolia.

Moreover, investment has increased, SPA administrations strengthened, the supply of body protection tools for wildlife rangers improved, funding for building and repairing several offices of SPA administrations is secured and some offices accepted for utilization, and also tens of typical work places for wildlife rangers were built, and several SPA administrations were supplied with short or ultra short wave radio stations.

Furthermore, following the 236th resolution of the Government 'Re-establishing of classification and categories of state administration state service positions', the classification of SPA administration workers and officers were upgraded from that of state service to state administration and this has allowed for the resolution of social problems facing workers of this sector.

Phased measures have been taken and implemented to include areas of Mongolia in the international network of the World Natural Heritage and Biosphere Reserve. As a result of this endeavor: PAA of Strictly Protected Areas of Great Gobi, Bogd Khan Mountain, Uvs nuur Basin, Eastern Mongolian, Mongol Duahur and Hustain Nuruu National Conservation Park were included in the network of international Man & Biosphere Reserves and Uvs lake Basin National Conservation Park, Orkhon River Valley natural complex area were included in the list of World's Natural and Cultural Heritage.

All together 11 areas namely: Mongol Dauhur Strictly Protected Areas, Terkhii Tsagaan lake, Khar-Us lake, Airag lake, Uvs lake, Achit lake, Ganga lake, Ugii lake, Buir lake, lakes in the Valley of Great Lakes

(Buuntsagaan lake, Taatsiin tsagaan lake, Adgiin tsagaan lake, Orog lake) and lakes in Khurh-Huiten valley were registered in the list of Annex of the Ramsar convention on 'Water and wetlands of International value, especially the areas where migrating birds inhabit'

In this way, the special protected areas of Mongolia are becoming world known and international cooperation is being expanded from year to year.

Bringing a justification that world countries are separated by administrative boundaries but not by natural boundaries: many efforts are being made to establish trans-boundary special protected areas for the purpose of protecting trans-boundary ecosystems and biodiversity in cooperation with neighboring countries.

Within this framework of efforts, the first joint international trans-boundary conservation park of 3 countries was established comprising Mongol-Daur Strictly Protected Area, Daur national conservation park of the Russian Federation, and Dalai Lake protected area of People's Republic of China.

Most of the international projects that are supported by different organizations of foreign countries target establishing SPA networks, and expanding, protecting and developing SPA buffer zones. These projects emphasize developing SPA buffer zones and are devoted to improving the social conditions of local communities, increasing awareness and capacity building in communities that would lead to promoting their interest and participation in protecting nature and the environment.

Research and study is one of the most important activities that is carried out in SPAs. Therefore, some research work will be conducted in cooperation with scientists, professors and students of national universities and institutions with the support of international projects for meeting the requirements for running management activities that suit the specifics of each SPA based on the research and assessment of the reserve and resources of SPAs.

In 2010, 1.800.0 million tugrics (the Mongolian monetary unit) were invested in special protection measures (which is almost double the average of the previous years' investments) and 2.400.0 million tugrics

were allocated in the state budget for SPAs' activities in 2011.

4. Land ownership of Protected Areas

In Mongolia, the territory of all special protected areas falls under state ownership.

TWO. STRATEGIES & CHALLENGES

Mongolian Academy of Sciences

Over the last few years, the Government of Mongolia has implemented policies to take land territories under special protection, while at the same time continuing to improve conservation management in already established special protected areas. Monitoring of conservation management and present level of methodology of administration and professionalism of administrations of the special protected areas and the following measures was undertaken to:

- Strengthen the material base of SPA administrations and reduced the size of territory under protection of one administration, and
- Update, newly develop and implement buffer zone management plans in all special protected areas. For instance, more than 20 management plans of buffer zones were updated and developed in the years of 2009 and 2010.

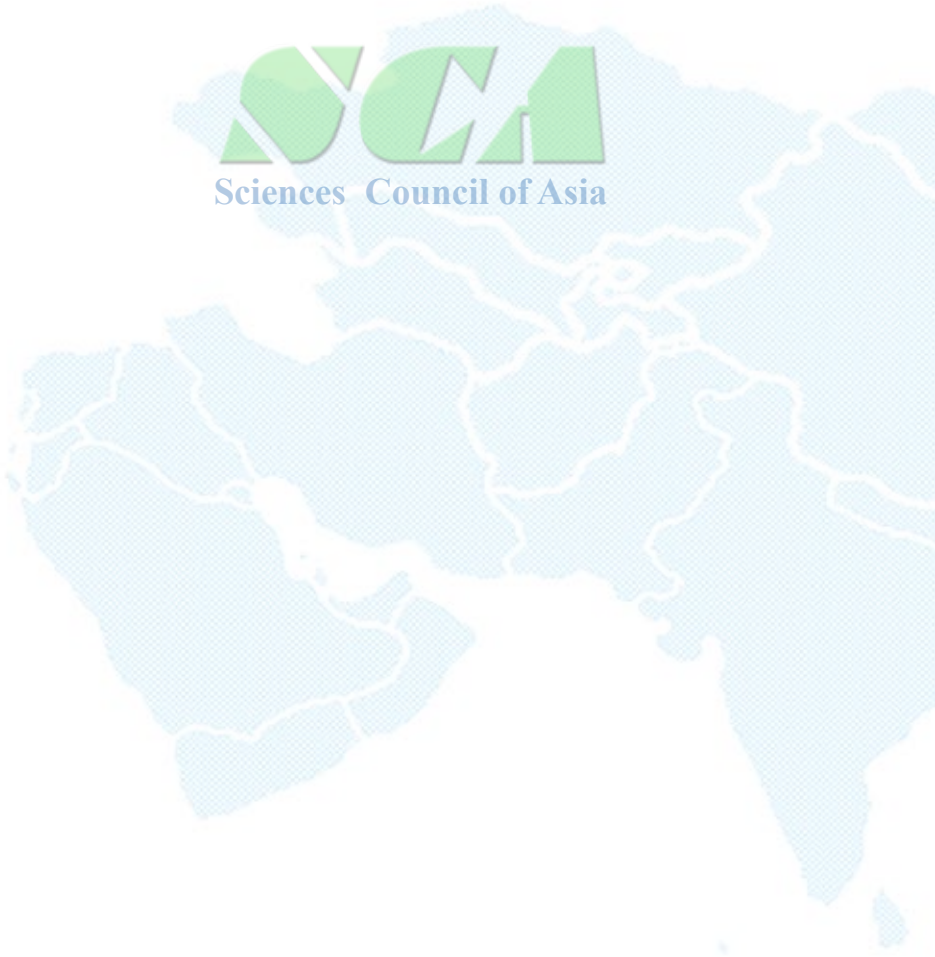
Local governments and local communities have been extensively involved in elaborating and implementing the buffer zone management plans of concerned special protected areas.

Moreover, the government pays attention to improving the livelihoods of local communities by implementing small projects and soft loan schemes through international programs and projects that are being implemented in the special protected areas and bi-lateral cooperation with other countries. The indirect impacts of the above endeavors positively influence improving the conservation management of SPAs.

Cooperation among professional rangers of administrations of SPAs and local communities is being extended to eliminate the threats to natural resources caused by poaching, illegal logging and mineral mining.



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**Current Status and Future
Strategies relating to Desertification
and Land Degradation / Land Cover
in Asian countries**



Current state of Desertification and factors affecting land degradation in Mongolia

Sciences Council of Asia

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Introduction

The Mongolian environment characterized by great diversity and particular complex spatial structure of soil and vegetation cover. Main landscapes of the country classified into mountain, forests, steppe and desert zones as well as unique ecosystems. Environmental issues such as desertification, land degradation, deforestation, loss of biodiversity, air and water pollution, and water desiccation are the disturbing problems facing the environment in Mongolia. In particular, land degradation and desertification are serious matters of concern and high relevance due to their impact on security, co-operation, economic development and the environment in the country.

Land degradation in arid, semi arid and dry areas resulting from various factors including climatic variability and human actions, where: land degradation means the reduction or loss of the biological or economic productivity and complexity of the land, and includes degradation to soils (both erosion and internal changes), vegetation and water.

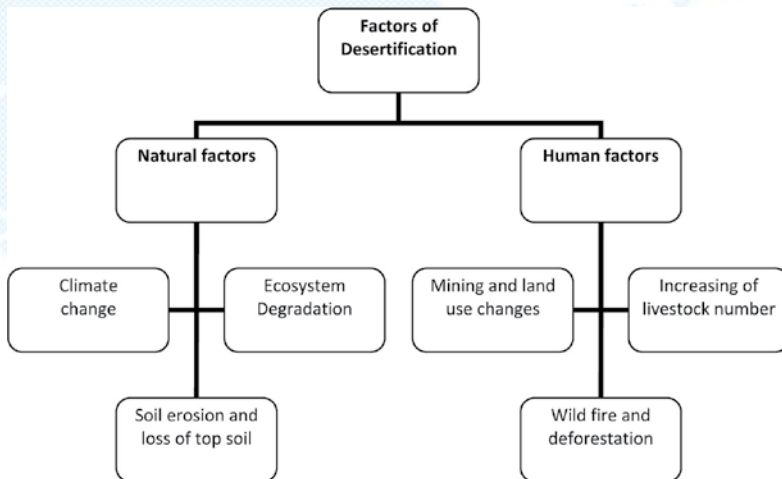
According to the definition of UNCCD, almost 90% of Mongolia's territory is vulnerable to land degradation and desertification. A recent assessment of desertification in Mongolia shows that 5% are very severely, 18% severely, 26% moderately and 23% slightly degraded. This means that roughly 72% of the total territory is degraded to some extent. Especially affected are the territories of the Uvs lake basin, the Great lake depression, and other provinces in Gobi region. Land degradation and desertification has a negative impact on the economies of rural settlements such as 145 soum centers of Mongolia that experience sand burial and shifts, and water scarcity.

One. Causes of desertification in Mongolia

Main causes of land degradation and desertification in Mongolia could be divided into two main groups of affecting factors including natural of climatic and human induced disturbances such as mining, overgrazing and deforestation etc.,

Climatic variability includes both the impact of droughts on human actions and the wider impacts of global changes including global warming, which are expected to increase the drought-susceptibility of many dry lands and human actions include the direct effects of land use activities and wider political and structural changes that cause disruption and changes to previously successful actions.

Figure 1. Main factors affecting land degradation and desertification



1.1 Climate changes and natural condition

Climate change is already a fact in Mongolia. Natural disasters such as drought, heavy snow fall, flood, snow storm, wind storm, extreme cold and hot temperature are recurrent whole year round. Annual mean temperatures taken at meteorological stations have been increasing since 1960s. Recent highly variable precipitation and consecutive periods of drought and *dzud* only serve to underline the serious need to prepare for an uncertain future as climate change continues.

The Mongolian plateau with an average altitude of 1500m is characterized by a continental climate. This means low precipitation

levels, and high variation of seasonal and daily temperatures. This makes this ecosystem vulnerable to climatic variations and the negative effects of inappropriate natural resource management. Mongolia's continental climate is characterized by significant fluctuations in climatic parameters and weather phenomenon. Droughts can occur for several years in the southern Gobi desert areas of Mongolia while concurrently, heavy rainfall and floods are the norm in mountains of the north. Strong snow storms in winter, sand and dust storms in the Spring and other significant extreme weather phenomenon are common in Mongolia. In a considerable part of the territory of Mongolia, the annual precipitation is no more than 200 mm. At the same time, 90% of this precipitation is lost due to evapotranspiration.

In the period between 1940 and 2004, the mean annual temperature of Mongolia increased by 1.9°C, which is comparatively higher than that cited in earlier research outputs in the Meteorology Institute. This trend is observed all over Mongolia to a similar extent. While temperatures have been increasing, the mean annual precipitation has been decreasing at an accelerating rate, suggesting that this trend will increase. The total annual rate of rainfall is slightly decreasing in the South and Center while slightly increasing in the rest of the country.

Summer rainfall patterns are changing. The frequency of rainfall covering large areas has decreased and precipitation falls increasingly in form of torrential rains on small land surfaces.

- According to the data of Meteorological Institute, evapotranspiration has also increased by 3.2-10% in the desert zones and by 10-15% in forest steppe and high mountain zones between 1940 and 2006.
- Annual precipitation changes are quite variable, decreasing at one site and increasing at a site nearby. Seasonally, autumn and winter precipitation have increased by 4-9% while spring and summer precipitation have decreased by 7.5-10%.
- Basing on the regional distribution of rainfall over the last 65 years, total precipitation has decreased by 8.7 - 12.5% in the central and Gobi regions, and increased by 3.5 - 9.3% in western and eastern parts of the country.

The present state of knowledge on climate change does not allow for a comparison of the relative importance of climate change and human intervention for desertification.

Numerical experiments in this study are presented that desertification

or land degradation in grassland would be affected not only regional climate but also hydrological cycle and surface energy budget. The reduction of evapo-transpiration mainly occurred in desertification area, accompanied by reduced precipitation and increased surface temperature. The biggest change is occurred in central and eastern region of Mongolia. It is indicating that a decreasing precipitation trend in central Mongolia might be consistent with land degradation.

The tree main mountain ranges isolate the country from Atlantic and Pacific climate; therefore, the country is semi arid. The four distinct seasons as hot short summer, cool autumn, long cold winter and windy-dry spring represent extremely continental climate. Thus generally the growing season is about three- four months. The pasture grass growth strongly depends on availability of a spring precipitation.

Table 1. Climate Characteristics of Mongolian Arid Regions

| Regions | Average air temperature (°C) January | Average air temperature (°C) July | Precipitation (mm/yr) | Evaporation (mm/yr) | Dryness index |
|---------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|---------------|
| Steppe Desert | -18.7 | 23.1 | 112 | 707 | 5.8 |
| Desert | -18.2 | 24.0 | 90 | 761 | 7.1 |
| Arid Desert | -17.0 | 28.0 | 43 | 911 | 18.6 |

Between 1960 and 2006, the number of days with dust and sandstorm events has multiplied between 3 and 4 times, with 61 days of such events in the Gobi and 127 in the great lake depression. Surface water sources are disappearing at an alarming rate. Compared to the 1970's census, about 683 rivers, 1484 springs and 760 lakes have dried out by 2003.

Two. Human factors affecting land degradation

Desertification generally results from climatic variations, human activities, and their interplay. The relative importance of climate and human factors in desertification has been debated for different regions at different periods of time.

Indeed, desertification most likely results from complex interaction among meteorological (e.g., temperature, rainfall, and wind), biophysical (e.g., vegetation, soil, animals, and biodiversity), hydrological (e.g., runoff and groundwater), and socioeconomic factors (e.g., farming, grazing, policy shifts, land management, and land-use patterns).

Human factors are probably the most important factors contributing to desertification.

Then desertification induced by the excessive human activities involved degradation of both vegetation and soil, leading to reduction in species diversity, vegetation cover, biomass production, and soil organic carbon (SOC), and nutrient content.

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2.1 Pasture land degradation and desertification

Desertification in arid, semiarid and dry sub-humid areas destroys land resources, reduces ecosystem productivity and services, exacerbates the poverty, and incurs instability of political systems in many developing countries. Mongolia, for example, has seriously suffered from the desertification in past decades, particularly the in arid and semi-arid zones of the country.

Overgrazing is the major cause of land degradation and desertification in Mongolia. This is a result of inappropriate access regulations to pasture land. According to an assessment by the land agency of Mongolia was conducted between 1999 and 2004, pasture carrying capacity was exceeded by 32.5%, which is equivalent to an excess of 16 million sheep units. Livestock stocking levels have reached roughly 70 million sheep units in 2009 as opposed to a 50 million average during the period 1940-1990.

For the statistical report of 2009, about 21.1 percent of GDP was produced by the agriculture sector, of which 82.5 percent accounts for livestock husbandry. According to the livestock census for 2009, in total 44.0 million livestock heads were counted which was higher by 735.4 thousand heads or 1.7 percent compared with previous year.

The main basis of Mongolia's economy, pasturing livestock husbandry still plays an important role in the economy, employment and export revenues of Mongolia. For the statistical report of 2009, about 21.1 percent of GDP was produced by the agriculture sector, of which 82.5 percent accounts for livestock husbandry. According to the livestock census for 2009, in total 44.0 million livestock heads were counted which was higher by 735.4 thousand heads or 1.7 percent compared with previous year. General health condition of pasture land in Mongolia is poor with unregulated grazing of some 30 million heads of livestock, such that the grass does not get a chance to re-grow. It shows that Mongolia had about 9.6 million heads of livestock at 130.0 million ha of grazing land area by 1918 then this figure was drastically changed having 28.0 million heads of