

# Analysis of Causes and Effects of Land Desertification in Outer Mongolia

Yijue Xu

Shanghai Starriver Bilingual School, Shanghai, China.

**How to cite this paper:** Yijue Xu. (2023). Analysis of Causes and Effects of Land Desertification in Outer Mongolia. *OAJRC Environmental Science*, 4(2), 92-95.  
DOI: 10.26855/oajrces.2023.12.005

**Received:** November 28, 2023

**Accepted:** December 25, 2023

**Published:** January 22, 2024

**Corresponding author:** Yijue Xu, Shanghai Starriver Bilingual School, Shanghai, China.

## Abstract

This paper mainly analyzes the causes and impacts of land desertification in the pastoral areas of outer Mongolia, we adopt field research, literature research, and interdisciplinary research methods. As a result, we find that the current problems of land degradation exist in the pastoral areas. The causes include climate change, overgrazing, mining, road laying, agricultural development, etc. Through relevant data analysis, literature research, and expert visits We find that the government is the most influential factor in the environment, and is also key to solving such problems. The government will most effectively help solve the current environmental problem of desertification through the formulation of reasonable grazing policies and the improvement of air pollution laws and regulations. At the same time, we find other solutions, such as NGO participation, natural environment education support, rational development in the tourism industry, etc. In general, we hope that this research can make a positive contribution to the restoration of the ecological environment in the desertified areas of Outer Mongolia.

## Keywords

Mongolia, Desert, Depasture, Environment, Economic, Government

## 1. Introduction

Initially started thousands of years ago and supporting human civilization and the domestication of animals, grazing, a practice that feeds animals with plants within a particular area, plays a crucial role in maintaining the ecosystems as it controls vegetation growth, prevents plant infestation, and preserve a wide range of plant communities. Instead of narrowing to such one benefit, grazing has various benefits to the world, including Carbon Sequestration, economic promotion, and soil health enhancement. Moreover, all the practices should be within a proper range so that grazing can present its ideal effect [1]. On the other hand, overgrazing could have a series of serious issues for the land.

Land degradation and desertification are serious issues worldwide, and they can cause many issues, including ecosystems, communities, economies, and the environment, such as Loss of Biodiversity, soil Erosion, Reduced Agricultural Productivity, and Desertification... All in all, it is a serious task for humans to prevent land degradation [2].

## 2. Combating land degradation and desertification in Mongolia: Tracing the Causes and Proposing Solutions

Before we implement actions to prevent land degradation and desertification directly, we need to know its causes. Land degradation in Mongolia is one of the most serious problems existing. According to a 2018 Mongolia LDN TSP Country Report, the total proportion of degraded land in Mongolia is 13.29 %, equal to 205,973.4 sq. km of land. Moreover, desertification and land degradation have affected 77% of Mongolia's total territory [3].

There are multiple causes of land degradation and desertification.

## 2.1 Climate change

According to Mongolia's environment ministry, Climate change-related desertification has been the main factor behind the increasing frequency of yellow dust storms in Mongolia in recent years. As the soil deteriorates, it becomes looser and easier to take to the air by a wind blow [4]. As a result, the apparent increase of the yellow dust storm is the phenomenon of desertification. Also, over the past 80 years, the average temperature in Mongolia has risen by 2.25 degrees Celsius, and the precipitation has decreased by 7%. The climate causes these.

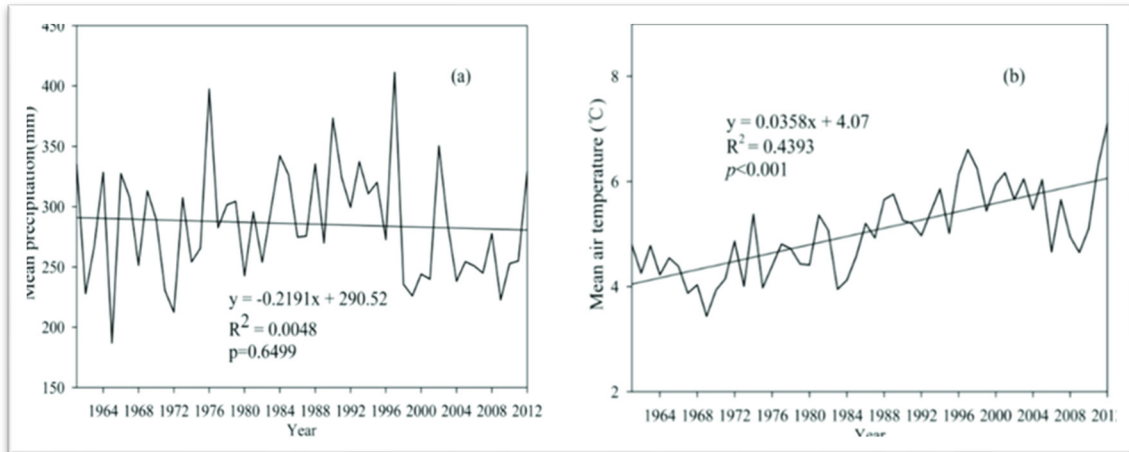


Figure 1. The trends of annual mean precipitation and temperature in Inner Mongolia over the past 50 years: (a) Precipitation; (b) temperature.

## 2.2 Overgrazing

Human activity is also a large component of land degradation and desertification. Overgrazing, irresponsible mining and unpaved railroads are some activities that increase desertification and land degradation in Mongolia.

Mongolia is one of the world's last surviving nomadic countries; according to the National Statistics Office, Mongolia logged 71.1 million head of livestock at the end of 2022, and this was a record high since the livestock animal census in 1918 for nomadic countries [5].

Grazing within a particular quantity limit is one of the best choices for diversifying the economy of a mining-dependent country. However, when it passes the limit, it becomes the main factor that propels desertification and land degradation as it reduces the grass that holds the soil.

However, what happens in Mongolia is overgrazing, and most nomads will increase the quantity instead of the quality of the livestock. For example, at the end of 2022, 191 herder families in the eastern Sukhbaatar province increased the number of herder households with more than 1,000 heads of livestock and reached the number 1100 [6].

There are multiple options for animals to graze on the grassland; however, among all the animals, goats gain the highest affection from the nomads. Goats could bring nomad families massive profits mainly derived from their expensive cashmere. However, when grazing goats, nomads could tremendously influence the grasses. Goats, instead of eating the grass leaves, which enables the grasses to additionally live, eat the whole plant, including the root, of the plant, and when the grass was eradicated, the soil lost its consolidation, which made it looser. After the plants were damaged, the natural plant species decreased, and the biodiversity also decreased, which left solely the most basic plants that did not consolidate the soil on the field.

According to the 2022 census, goats covered up 38.8% of grazing animals in Mongolia (“Статистикийн мэдээллийн нэгдсэн сан”), and this number kept increasing.

## 2.3 Mining

Mongolia has a single economic development model, especially the proportion of the tertiary industry in GDP is relatively low. Under the trend of the widening gap between the rich and the poor in China, it can only rely on mineral and energy exports to alleviate domestic conflicts. Mining is one of the main income sources of Mongolia, as it brings over 20% of the country's GDP. However, with such ideal economic profit, it brings numerous environmental issues. While operating at the headwaters of Mongolia's river system, the mining industry unintentionally dried over 360 rivers, streams, lakes, and springs within the nation in 2022.

Moreover, small mining companies often promote illegal actions that will finally lead to desertification. The small illegal mining company, or Ninga (other names for the individual illegal miner), often uses the gold detector in a wide range and mine without permission. As a result, with improper behavior and skills, the minerals and sediments are likely to go into the river, which serves as pollutants (Liu et al.). Small-scale mining companies are often in cahoots with corrupt officials and are harder to crack down on because they are more flexible and cheaper [7].

## 2.4 Roads paving

The unpaved rural road also plays an important role in speeding up the country's desertification and land degradation.

Having over 112,400km of the state road network, only a few over 7000km are paved (Б.Анхтуяа). Mongolia's Ministry of Road and Transport Development showed that they have a state road network of over 112,400 km, of which only 7830km are paved, which means there are at least 104,570km of unpaved roads in Mongolia. Therefore, driving on the car-made grass route in rural areas seriously damages the grass and soil, causing soil degradation. Moreover, many paved roads are suffering from poor-quality construction, which compels cars to use more unpaved roads. Therefore, the seriousness of this issue could only be greater. In addition, Mongolian herders nowadays prefer to ride motorcycles to look for livestock instead of riding horses. With a heavier and faster spin of the wheel, the motorcycle also causes damage to the grass [8].

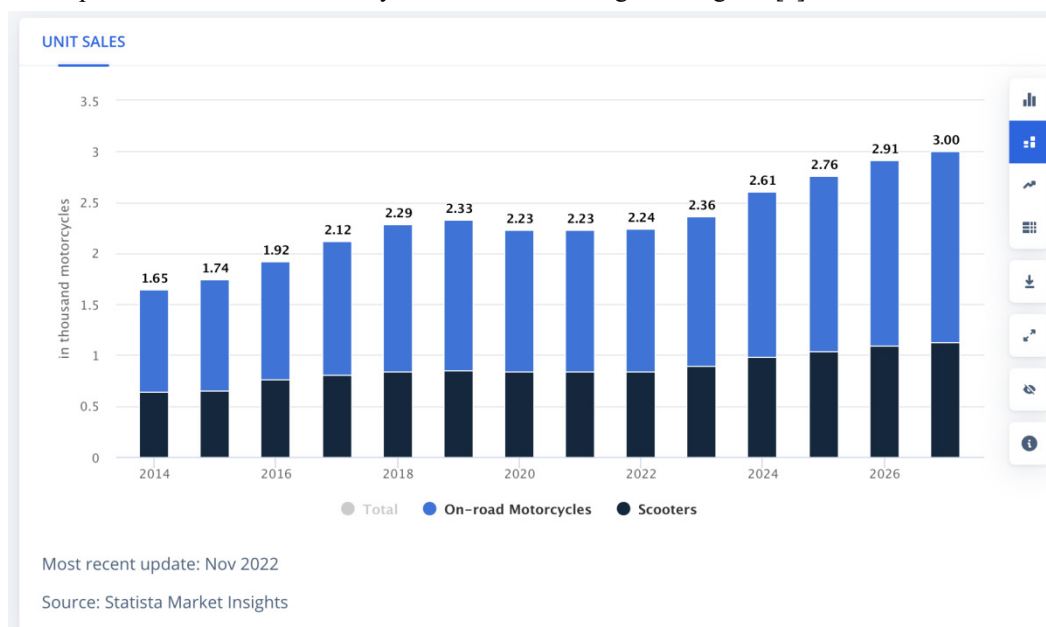


Figure 2. The past and anticipated trends of Mongolians buying On-road Motorcycles and Scooters from 2014 to 2027.

## 2.5 Farmer

Farmers in the northern part of Mongolia plant crops such as wheat on a large scale. However, according to Professor Naran Garvuu from the National University of Mongolia, this action could also harm the original natural plantation of the grassland, causing a loss of biodiversity, and the original plant seed will be damaged. Destroying the local grass species could finally lead to a risk of land degradation and desertification.

## 3. Government effort and challenges

When the nation was exposed to such detrimental environmental conditions, the government used to be the one who should take responsibility.

Mongolia is currently suffering from multiple environmental issues. Of various issues, air pollution in Ulan Bator and overall national land degradation were two of the most serious issues in their country. However, instead of pushing forward policies that could alleviate the extent of land degradation that was caused by overgrazing (the largest cause of desertification and land degradation), the Mongolian government mainly promoted assessment to make the air better [9].

In order to mitigate the issue of air pollution, the government implements policies to decrease its national air pollution. Specifically, the policy restricts actions on electricity and heat generation, energy efficiency in industry and buildings, and reducing the number of livestock in agriculture ("Mongolia Increases Climate Change Ambition with Actions That Improve Air Quality

and Human Health | Climate & Clean Air Coalition”).

Moreover, this assessment was surmised to bring a decrease of 12% in black carbon emissions, 9% in primary fine particulate, and 10% in nitrogen oxide emissions in 2030 compared to a business-as-usual scenario.

Mongolia’s economy largely relies on animal husbandry. Also, over 40% of Mongolians are nomads, and they rarely had any income other than grazing animals. Under such conditions, even though the overgrazing issue is engulfing Mongolia’s healthy grasslands, the government did not make any relevant policy to restrict the number of animals grazed by the nomads. Instead, the government implemented policies to improve their local husbandry further (Б.Анхтуяа, “USD 91 Million for Developing Mongolian Livestock Husbandry—News. MN”)

#### 4. Other solutions

Government is not the only one who cares about the environment. However, private sectors and NGOs also put actions in progress which serve as the propeller of promoting the world to reach the final goal of a better environment.

In order to alleviate the process of worldwide land degradation, WWF (World Wide Fund for Nature) implemented a series of processes to address the problem [10].

Arousing attention on the internet: NGOs, WWF (World Wide Fund for Nature) are the organizations that devote their attention to environmental protection. Therefore, Mongolia’s condition made the researchers investigate how to protect Mongolia’s decaying environment and find the most fitting community-based natural protection that could be implemented in this nation.

Holding camps and activities: National University of Mongolia cooperated with organizations such as WWF, arousing local Mongolian students' minds about environmental protection. In their summer program, they provide chances for students to learn more about their hometown’s climate, organisms, and landscape, as well as ways to protect the places they live [11].

#### References

- [1] The Net Influence of Drought on Grassland Productivity over the Past 50 Years—Scientific Figure on Research Gate. Available from [https://www.researchgate.net/figure/The-trends-of-annual-mean-precipitation-and-temperature-in-Inner-Mongolia-over-the-past\\_fig4\\_364046161](https://www.researchgate.net/figure/The-trends-of-annual-mean-precipitation-and-temperature-in-Inner-Mongolia-over-the-past_fig4_364046161) [accessed 14 Aug. 2023] (figure 1).
- [2] Mongolia Reports 3.6 Mln Livestock Deaths due to Natural Disasters This Year. MDN—Myanmar Digital News, 21 June 2023, [www.mdn.gov.mm/en/mongolia-reports-36-mln-livestock-deaths-due-natural-disasters-year](http://www.mdn.gov.mm/en/mongolia-reports-36-mln-livestock-deaths-due-natural-disasters-year). Accessed 14 Aug. 2023.
- [3] Limited, Bangkok Post Public Company. Why Large Parts of Mongolia Are Affected by Desertification. Bangkok Post, 10 May 2023, [www.bangkokpost.com/world/2567414/why-large-parts-of-mongolia-are-affected-by-desertification](http://www.bangkokpost.com/world/2567414/why-large-parts-of-mongolia-are-affected-by-desertification). Accessed 14 Aug. 2023.
- [4] Motorcycles—Mongolia|Statista Market Forecast. Statista, [www.statista.com/outlook/mmo/motorcycles/mongolia#unit-sales](http://www.statista.com/outlook/mmo/motorcycles/mongolia#unit-sales). Accessed 14 Aug. 2023. (figure 2)
- [5] Статистикийн мэдээллийн нэгдсэн сан. WWW.1212.Mn, 16 Jan. 2023, [www.1212.mn/en/dissemination/48963228](http://www.1212.mn/en/dissemination/48963228). Accessed 16 Aug. 2023.
- [6] Liu, Yu, et al. A Review of Water Pollution Arising from Agriculture and Mining Activities in Central Asia: Facts, Causes and Effects. *Environmental Pollution*, vol. 291, Dec. 2021, p. 118209, <https://doi.org/10.1016/j.envpol.2021.118209>.
- [7] Б. Анхтуяа. Mongolia’s Ambitious Road Construction Completed—News. MN. News. MN—the Source of News, 27 June 2022, [news.mn/en/797668/](http://news.mn/en/797668/). Accessed 19 Aug. 2023.
- [8] Khukhnokhoi, Khorloo, & Myagmarsuren Battur. Modern Horseback Rides Aim to Preserve a Tradition. *Global Press Journal*, 25 Nov. 2021, [globalpressjournal.com/asia/mongolia/taking-ride-preserve-tradition/#:~:text=](http://globalpressjournal.com/asia/mongolia/taking-ride-preserve-tradition/#:~:text=Up%20to%2040%20percent%20of). Accessed 19 Aug. 2023.
- [9] Meet Mongolians & Nomadic Lifestyle. Tour Mongolia, [tourmongolia.com/meet-mongolians-nomadic-lifestyle/#:~:text=](http://tourmongolia.com/meet-mongolians-nomadic-lifestyle/#:~:text=Up%20to%2040%20percent%20of)
- [10] USD 91 Million for Developing Mongolian Livestock Husbandry—News. MN. News. MN—the Source of News, 29 Jan. 2020, [news.mn/en/790692/](http://news.mn/en/790692/). Accessed 19 Aug. 2023.
- [11] Mongolia Increases Climate Change Ambition with Actions That Improve Air Quality and Human Health|Climate & Clean Air Coalition. *Www.ccacoalition.org*, 17 Mar. 2020, [www.ccacoalition.org/news/mongolia-increases-climate-change-ambition-actions-improve-air-quality-and-human-health](http://www.ccacoalition.org/news/mongolia-increases-climate-change-ambition-actions-improve-air-quality-and-human-health). Accessed 20 Aug. 2023.