



Research on Current Situation of Combating Desertification in China

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Abstract. As land desertification has intensified in recent years, natural disasters occur in China more and more frequently, such as land storms and the mud-rock flow. These disasters not only affect air quality but threaten the lives and property of many people. By analyzing the current situation for desertification of China, the paper is to show the main reasons for desertification in China, and analyze how desertification influences the living environment of many species so that they are endangered in the world. The authors found that the two main causes of desertification are natural and man-made, among which human behavior has the most serious damage to the environment. The author further puts forward some suggestions for protecting the environment, such as planting trees.

Keywords: Desertification · Biodiversity · Overgrazing · Overexploitation · Comprehensive development

1 Introduction

The definition of land desertification is that land degradation in arid areas, semi-arid areas, and dry sub-humid areas, the desertification is caused by climatic change and human activities [1]. With the expansion of desertification areas, habitats, where species can live will reduce. If this situation sustains for a long time, it will break the balance of nature, so desertification has begun to become a serious problem for humankind. In recent about 70 years, China experienced serious desertification. Data shows that 34.6% of areas (about 3.32 million km²) are classified as drylands, and in these drylands, 2.62 million km² are in accord with the UNCCD (United Nations Convention to Combat Desertification) definition of decertified land [2]. This paper will analyze the current situation of desertification, aiming to explain the impact of desertification on the environment and its potential harm to species and even human beings. Moreover, due to the loss of wetlands and lakes, some suitable areas for wildlife to survive also reduce. Some species already disappeared from this world, and some are going to disappear, which becomes endangered. Generally, all food for people comes from nature, there must be some negative effects on people's quality of life if the biodiversity is damaged. In the long run, mass extinction will endangered human live and health.

2 Analysis of the Causes of Land Desertification in China

2.1 Natural Environment Causes of Desertification

Northern and Western China is considered vulnerable to desertification because of its arid climate, population growth, and land abuse. Affected by the land and sea location, the distance of these areas is far from the Pacific Ocean, Indian Ocean, Atlantic Ocean and the Arctic Ocean. Therefore, the ocean's warm and wet moisture is difficult to reach inland, which leads to the precipitation of northwest areas being less than 400 mm annually [3]. Another important factor is wind, some desertification is formed by wind erosion. Wind erosion mainly occurs in arid, semi-arid climates and humid areas suffering from periodic droughts, such as Qaidam in Qinghai, Turpan in Xinjiang and Lop Nur in South Xinjiang. With the wind, sand particles roll, saltate, and suspend in the air, and eventually form wind-sand. In this way, geomorphic processes of erosion, migration and deposition will be formed. The erosion capacity of carrying sand is much greater than wind without sand since the crash and abrasion of sand driven by wind. Thus, wind erosion is acute and then surface soil loss, and soil quality gets worse, this leads to land productivity reduction [4].

2.2 Human Causes of Desertification

As mentioned above, geographical position and wind erosion cause desertification. But natural factors are not enough to form such serious desertification, and more importantly, it is affected by human activities.

2.3 Overgrazing

Overgrazing controls the growth of species with high nutritional value and promotes nutrient-poor species growth. This phenomenon decreases the nutrient cycle, so the result is grassland degradation [5]. Grazing by cattle and sheep has increased, grasslands are in short supply, and grassland ecosystems are destroyed so that degradation occurs. Mongolia is one of the most serious countries with overgrazing. The main source of income in Mongolia is the livestock industry, which accounts for 90% of agricultural production. International Monetary Fund (IMF) shows that from 1990 to 2020, the number of livestock in Mongolia nearly tripled, far beyond the affordability of grassland [6]. Large-scale overgrazing leads to a rapid increase in land degradation. Moreover, sandstorms caused by grassland degradation not only damage Mongolia but spread to East Asian countries such as China, Japan and Korea.

In China, overgrazing usually occurs in northern cities, the typical city is Inner Mongolia, and the major reason is herdsman graze without a plan. In the past, some areas of Inner Mongolia grasslands implemented a camp system that grazed every two or three-quarters. With the increase in livestock, the proportion of seasonal camps is out of balance, resulting in grazing randomly.

2.4 Overexploitation

In order to pursue the yield of food, human is willing to destroy the ecological environment to plant crops. Overexploitation includes large-scale disafforestation, lake reclamation and unreasonable land reclamation or farming. These behaviors can cause massive water and soil erosion, severe sand-wind, flooding and loss of species and other ecological disasters. The relative organizations evaluated 8688 near-threatened or threatened species on the “red list” on IUCN, there are 11 kinds of threats such as overexploitation, pollution, climate change, agricultural activity, and so on. It found that 72% of species were affected by overexploitation, and the main activities include logging, fishing, hunting and catching wild species [7].

3 Impacts of Desertification

The extinction of a species will produce a chain reaction of other species, which has an impact on the living environment of humans.

3.1 Ecosystem

Endangered species always co-exist with other endangered species, and the interactions between species are complex and unpredictable. In a wide geographic area, the total number of species of creatures in various groups that are present in a place tends to be positively connected with the number of people [10]. The ecosystem will change when they are disappeared. As the ecosystem degrades or collapses, humans will lose many of the natural functions that we take for granted, such as forests that bring rainfall to aquifers or mangroves that protect coasts from erosion. The diverse ecosystem can withstand extreme environments, and humans will face more risks without a robust ecosystem. The diverse ecosystem can withstand extreme environments, and humans will face more risks without robust ecosystem. There is a positive relationship between species and humans. For example, there is no vegetation to cool heat waves in the air, or more coastal flooding because there are no mangroves to absorb waves. As humans move closer to the past wild environment, we also face higher risks, such as threats from animal-borne diseases and wildfires. Therefore, maintaining ecological balance is also the key to sustainable human development.

One of the most important parts of ecological balance is to ensure biodiversity. Biodiversity is the commonwealth of all mankind and the basic condition for human survival. The development of desertification has worsened the quality of organisms and reduced the abundance of species, posing a serious threat to biodiversity. The reasons for the loss of biodiversity caused by desertification are as follows: desertification changes landscape patterns and tends to simplify landscape types. The fragmentation of the living substrates of some species and the appearance of islands in distribution due to changes of shrinkage of species of habitats, which greatly reduce the distribution area of populations: desertification causes habitat degradation, that is, the deterioration and dysbiosis of the structure and function of the entire ecosystem. The specific performance in reduced productivity, species survival ability, the destruction of the species, and community

structure, many species are endangered or dying. For example, studies have shown that habitat desertification leads to significant changes in lizard community composition [8]. Todd and Andrews [9] reported that lizards, density and the number of species richness and diversity also decrease with habitat desertification degree aggravate or lower. In northern Madagascar, the diversity of lizard species was only half of that in the forest although the richness of lizard species was not affected in the orchard-cultivated area, while the species, abundance, and diversity of lizards were significantly reduced in deforested areas. Differences in vegetation conditions also enabled unprotected degraded habitats to have significantly lower lizard species richness and abundance than protected habitats. Therefore, habitat desertification has gradually decreased the species richness of lizards and further led to the reduction or even loss of lizard species diversity. It can be seen that desertification control is the key to the sustainable development of biodiversity. Conversely, the restoration and protection of biodiversity are conducive to the reversal of desertification.

3.2 Health

The extinction of species will affect the development of medical treatment, and there is no cure for people in the future. The extinction of species will bring an incalculable loss of genetic value. Over billions of years of biological evolution, almost all living things have natural enemies, or the genes carried that could overcome kinds of damages. For example, the penicillin comes from fungi; Scientists are studying the venom of some tarantulas whether one of the compounds could help cure diseases such as Parkinson's; A molecule from a rare Marine bacterium could be a new treatment for melanoma and more. Once these genetic resources have disappeared, humans will become more vulnerable in the ecosystem. It is possible that the effects of extinctions go far beyond that, the sustained efforts will be needed to conserve precious and rare species and slow the rate of extinction.

4 Suggestions on Combating Land Desertification

The first important point is needing a clear goal of regulation. More specifically, it is necessary to implement national environmental and resource laws, and establish a system that can both prevent desertification and promote sustainable economic development.

4.1 Afforestation

The direct reason for desertification is many trees are cut down, so no vegetation can protect the surface. This requires people to project the forest reasonably, and to protect the windbreak forest will not be damaged in the process of wood mining. This can reduce sandstorms when the wind comes strongly. At the same time, the ecosystem plays a vital role in the self-repair function. People must increase protection to avoid someone to destroy forest areas without permission, in order to promote the natural restoration of ecology [11]. For example, China's Ant Group launched ANT FOREST in 2016, people can walk or use bike instead of driving car, this actions to reduce carbon emissions are

calculated as “green energy”. Alipay will plant a real tree when the energy reaches a sufficient quantity, and they use this activity to motivate users to do carbon environmental things.

4.2 Population Control

As the Chinese population is growing, the pressure of cultivating grain for farmers is increasing. This led to the demand for natural resources rising, and after a long time, it will damage the quality of the soil. To solve this problem, the government should control the growth rate of the population, and also improve the quality of people. Inner Mongolia Autonomous Region implements the Sand Control Law to standardize law enforcement methods, the purpose is to improve consciousness of sand prevention and control in the whole society.

4.3 Limit Grazing

Limiting the number of animals grazing can avoid heavy grazing. Decreasing grazing intensity contributes to the gradual restoration of vegetation in degraded pastures and community stability. Although there was no significant difference in vegetation coverage, and above ground and underground biomass between light grazing and moderate grazing, the proportion of bare land in moderate grazing areas was higher. This means that moderate grazing may pose a risk of wind erosion and desertification during dry and windy seasons [12]. Therefore, herdsmen need to change the traditional grazing production mode from four-season grazing to two-season grazing to reduce grazing pressure on grassland.

5 Conclusion

In conclusion, the paper states the definition of desertification and why it is a serious issue for humans. Starting from the reasons, including natural impacts and human impacts, the main natural cause is climate change, and as for the human aspect, overgrazing and over exploitation are both vital reasons that destroy the land in China. Moreover, land desertification also affects biodiversity, for many species, their habitats are decreasing and even vanished. In order to survive in a safe and comfortable place, they have to migrate again and again, until suitable lands are disappeared, and they tend to extinction. The article lists three sides that the life of humans will be affected if more and more species are endangered or dying, which are ecosystem, economy and health. All signals show that controlling desertification is urgent, and each of the people has the responsibility and obligation to participate in biodiversity and sustainable development. A stable ecosystem can ensure the realization of a healthy and sustainable ecosystem service function which plays an important role in supporting the healthy development of human life.

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