

Word Desert Championship

Guide to Environmental Issues of the Represented Deserts and Regions

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“*Trees for the Future* is dedicated to improving the livelihoods of impoverished farmers by re-vitalizing degraded lands.

Millions of impoverished, smallholder farmers in the developing world use environmentally destructive farming methods to meet the needs of their families. These farmers are resource poor and they face significant risks in adopting new production techniques. This dilemma traps them in a cycle of poverty and promotes harmful land use practices that limit the potential of the land today and in the future.

We envision a world where farmers can leave a legacy of opportunity through sustainable farming and forestry practices while also using their land productively.“ (Charity Navigator)

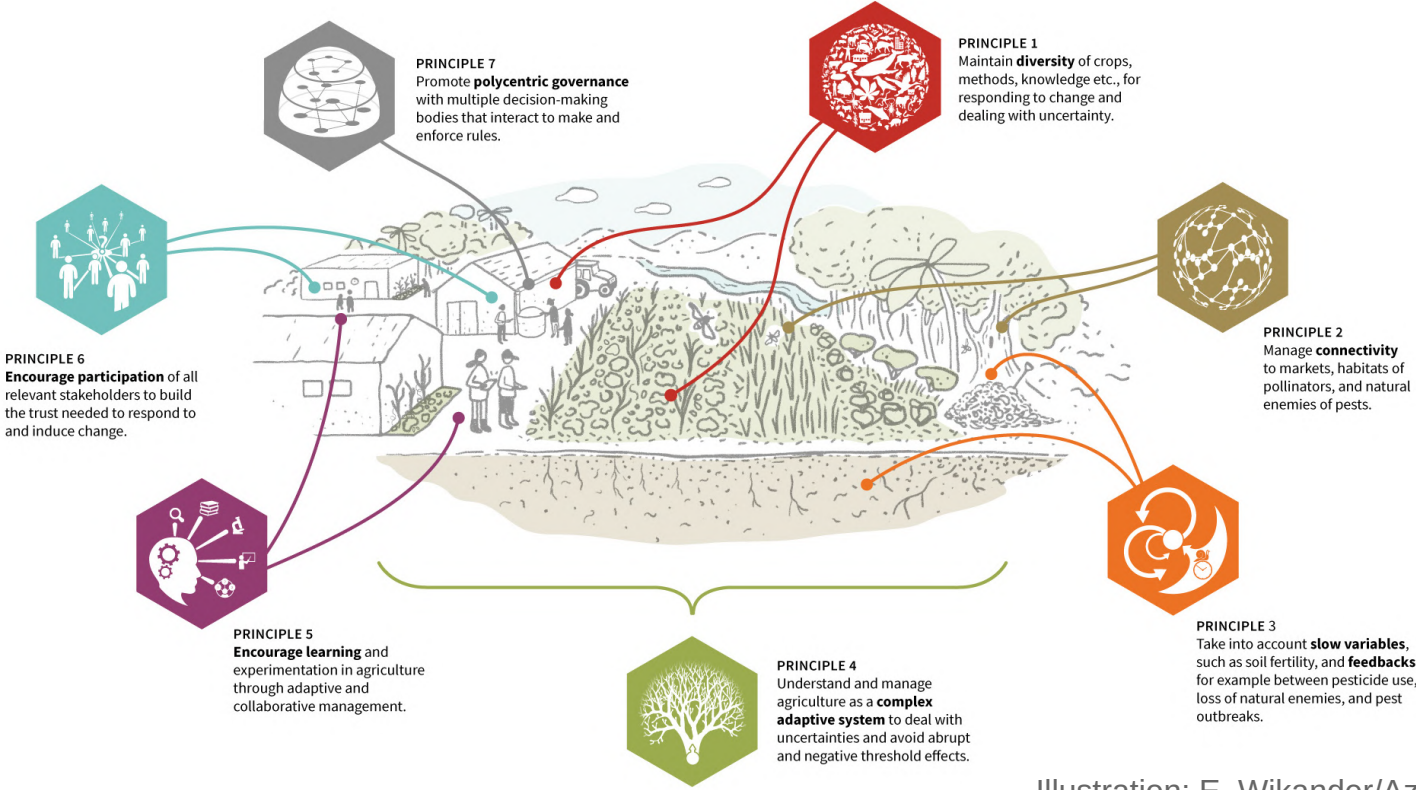


Illustration: E. Wikander/Azote

1. Chile: The Atacama Desert

The Atacama is one of the driest and least populated places on Earth. In the 18th and 19th century, the area was heavily deforested to use the wood as firewood for the starting silver and saltpeter mining¹.

More recently, the metals industry is changing the terrain even more, with access roads creeping across pristine salt flats and the water-intensive extraction process leaving the ground pocked and scarred. The extraction process consumes huge amounts of water in a region that gets less than an inch of rainfall a year.



Fig. 1: Street through remains of the “Pampa del Tamarugal”. Those trees were spread across large parts of the modern desert.

2. Mongolia and China: The Gobi Desert

The most potent threat in the area of the Gobi Desert is desertification. Caused by humans cutting down forests, and other vegetation. Sometimes chemicals are added to the soil which can seep in and poison the rest of the soil, killing other plants and animals.

Multiple companies are currently trying to get approval to mine the Gobi Desert for gold and copper². This would disrupt the natural ecosystem and harm the soil, plants, animals. It would also displace the people who make the desert their home in order to set up machines and drill.



Fig. 2: Mining in the Gobi Desert.

¹ [EL BOSQUE DE LA PAMPA DEL TAMARUGAL Y LA INDUSTRIA SALITRERA](#)
[War for water in Chile's Atacama Desert: Vines or mines? - BBC News](#)

² Gantumur A., Mętrak M., Wiłkomirski B., Suska-Malawska M., 2017: Environmental and social consequences of gold mining in Mongolia (Środowiskowe i społeczne konsekwencje kopalnictwa złota w Mongolii), *Monitoring Środowiska Przyrodniczego*, Vol. 19(1), s. 11-15.

3. Brazil: The Microregion of Jalapão

While areas around Jalapão are partially protected, it is important to talk about the larger region, and all biomes of Brazil. Everybody knows about the destruction of the Amazon forest and the Atlantic rainforest, but also the Cerrado, which is the most biodiverse savanna biome in the world and the Caatinga, a desert-like biome in the Northeast of Brazil are in high danger due to mining and destruction because of agriculture and creating cattle pastures. The Cerrado is not recognized as a National Heritage, and includes the Guarani Aquifer which supplies water to a third of the Amazon river. The Caatinga is the most degraded ecosystem in Brazil after the Atlantic rainforest, already ~50 % have been lost³.

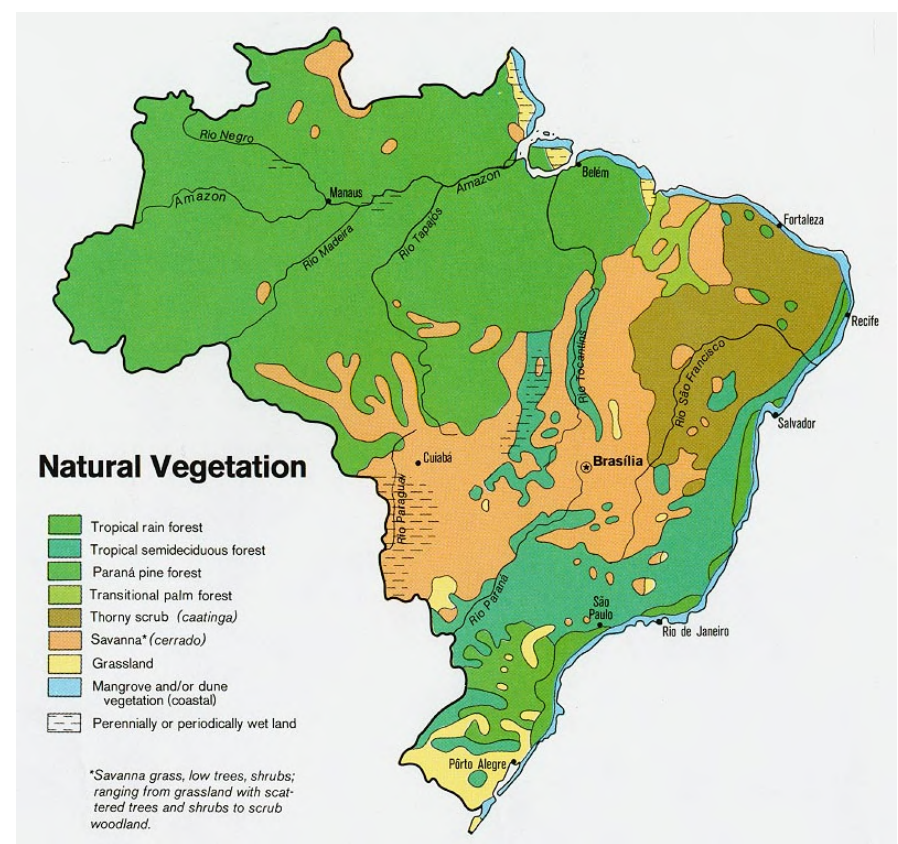


Fig. 3: Biomes of Brazil, Cerrado in orange, Caatinga in dark brown-green.

4. South Africa: The Karoo

The most extensive pressure on biodiversity in this hotspot is livestock grazing. Goats, sheep, ostrich and small game ranching are the dominant land use in approximately 90 % of the Karoo. Ostrich grazing, unlike small livestock grazing, tremendously impacts veld by selective grazing of high protein plants and seeds and compacting soil, effectively creating dust bowls.

Other threats include mining, unregulated tourism and illegal collection of plants. At least 5 % have been irreversibly lost to mining and agriculture, and around 2/3 of the land has been seriously overgrazed⁴.



Fig 4.: Ostrich farm in the Karoo.

3 [Land cover changes in the Brazilian Cerrado and Caatinga biomes from 1990 to 2010](#)
[Appetite for Destruction: Brazil's soy boom devours tropical savanna \(reuters.com\)](#)
4 [Desertification in the Karoo | Desertification | The Guardian](#)
[Long-term impacts of livestock grazing in the Succulent Karoo](#)
[Factors influencing ecological sustainability in the ostrich industry in the Little Karoo, South Africa.](#)

5. Indonesia: Mount Bromo

In the last century, the Indonesian archipelago has lost most of its big mammal wildlife. Not only tigers, leopards, rhinoceroses and elephants have become extinct or close to extinction⁵, mostly because of hunting, but also because of increasing deforestation because of land-use change to plantations and urbanization demands of a fast-growing population. The island of Java, where Mount Bromo is located, once had a unique endemic fauna. The areas will not become a dry desert, but still be stripped off its rich and unique natural diversity.



Fig. 5: Killed Javan tiger and Javan leopards. Javan elephants are also already extinct.

6. Australia: The Simpson Desert

Introduced species such as foxes, hares, feral cats and feral camels are a big problem in the Simpson Desert. They eat much of the small wildlife and a lot of the vegetation that native animals rely on for survival. Although human impact in the Simpson Desert is minimal, the impact of invasive species is a big problem and needs actions to limit or eradicate the destruction⁶.



Fig. 6: Feral camel herd in the Simpson Desert.

5 [Indonesian Animals that are Extinct \(asep.id\)](http://asep.id)
[Top 40 Endangered Animals in Indonesia - FactsofIndonesia.com](http://FactsofIndonesia.com)
6 [Introduced Species in Australia: Our 9 Most Invasive Species | Better Homes and Gardens \(bhg.com.au\)](http://bhg.com.au)
[Simpson Desert - 10 Deserts Project](http://10DesertsProject)

7. China: The Taklamakan Desert

The low fertility of the soil and absence of vegetation has resulted in limited sedentary agriculture (farmers don't tend to stay long term). Immoderate utilization of water resources by humans have resulted in reduced water flows, causing die-offs of trees. This has a negative impact on environmental challenges such as airborne dust and dust storms.



Fig. 7: Sand storm in Xinjiang.

8. Greenland: Disko Island (Arctic Circle)

The Arctic is facing the well-known issue of melting ice due to climate change and thereby severe changes of the Arctic ecosystems. But already 1100 years ago, nature around Greenland was affected by humans, when Vikings stripped the island bare of its natural forests to build homes and ships⁷.

Formerly spread across subarctic-arctic islands, the great auk (also known as Arctic penguin) became extinct in 1844 due to hunting and poaching of eggs⁸.



Fig. 8a/b (above): Remains of forests on modern Greenland. There are some ongoing reforestation efforts in the recent years.
Fig 8c (left): Painting of a colony of great auk.



⁷ [The Forest Plantations in The Greenlandic Arboretum – University of Copenhagen \(ku.dk\)](#)
⁸ [ADW: Pinguinus impennis: Information \(animaldiversity.org\)](#)

9. Chad: The Ounianga Lakes

In Chad about 80 % of working population is employed in the agricultural sector and it is the most vulnerable country to climate change. Sustainable agriculture, as an adaption strategy to climate change, is also a good practice for increasing agricultural productivity and alleviating poverty and food insecurity⁹. Water is very scarce, it is important that it is used effectively in agriculture. Reservoirs can't be emptied, species that use little water for growth are recommended and additionally planted bushes and trees can help with giving shade and stopping erosion. This way, more water will be available for drinking and sanitation.



Fig. 9: Agriculture in Chad. Rainwater is harvested to be used for the crops.

10. Croatia: The Archipelago of Pag

Pag Island suffers from extreme soil erosion due to a combination of harsh climatic conditions and intensive grazing and deforestation caused by humans. Around the Mediterranean Sea, these changes already started to happen more than 3000 years ago, and were accelerated by the construction of the first big Mediterranean fleets, which were the cause for removal of big parts of natural forests in Italy, Greece, Turkey, Lebanon and other coastal countries. Some degree of change is also natural due to desert shifts, hurricanes, floods, wildfires, etc. While these are natural occurrences, how such environmental disasters are influenced by human activities is still being studied.



Fig. 10: View of modern Pag Island. In medieval times like other previously mentioned coastal deserts, more trees grew here.

11. Central Asia: The Pamir Mountains

The Pamir region is characterized by extreme climatic conditions. It hosts rich biodiversity and remote societies that are dependent upon the mountainous environment. Most people are dependent on subsistence farming. But erosion makes it difficult. Forests have long disappeared since their wood was used as firewood. Current land and water resources management practices are threatening the long-term preservation of this unique area as a space both for human use and wilderness.



Fig. 11: Water and sustainable agriculture in the Wakhan Valley (Afghanistan).¹⁰

12. Central Asia: The Kyzylkum (Red Sand)

Huge mines, like the Muruntau open-pit gold mine (producing 38.5 million t of ore/year) have destroyed the natural desert landscape. The southern region of the Kyzylkum Desert also contains large deposits of natural gas. Minerals such as turquoise, graphite, and marble have been found in large quantities in the mountainous regions of the desert¹¹.



Fig. 12a: Muruntau gold mine.
Fig. 12b: Copper mine.



Fig. 12c: Oil refining factory.

¹⁰ [Water and Sustainable Land Use in the Wakhan Valley - Our World \(unu.edu\)](#)
Creeping Environmental Problems in the Pamir Mountains: Landscape Conditions, Climate Change, wise Use and Threats. In: Climate Change Impacts on High-Altitude Ecosystems, Eds: Öztürk, M., Hakeem, K.R., Faridah-Hanum, I., Efe, R.

¹¹ [The Kyzylkum Desert - WorldAtlas](#)
[Reconstruction of Kalmakyr copper mine completed in Uzbekistan \(trend.az\)](#)

13. USA and Mexico: The Sonoran Desert

This ecosystem is under threat from increasing urbanization because of its proximity to fast-growing city of Phoenix. Increased development pressures affect the Sonoran Desert through more roads, power lines and development as well as increased recreation locations¹².



Fig. 13: Urbanization in the Sonoran Desert.

14. India and Pakistan: The Thar Desert

Increasing human population and developmental activities have caused considerable damage to this unique desert ecosystem. Several important grasslands have been converted to agricultural fields and there is pressure to convert more grassland into such uses. Rivers and channels through the desert are heavily polluted¹³.



Fig. 14: Luni River’s water has become blue from indigo dye from local factories.

¹² [Effects of Urbanization Symposium: Evaluating Impacts of Urbanization on the Sonoran Desert Ecosystem \(arizona.edu\)](#)
[Urbanization alters soil microbial functioning in the sonoran desert — Arizona State University \(elsevier.com\)](#)

¹³ [Pollution in Luni River | RajRAS](#)
[The Killing Of River Luni - From the Archives of Tehelka.Com – DesiCrafts \(desicraftshop.com\)](#)