



Lessons of the Loess Plateau

2010 • Running time 50 minutes • Directed by John D. Liu • Distributed by the Environmental Education Media Project

Director John D. Liu describes the successful restoration of the Loess Plateau in China over a period of 20 years and the impact of the land's transformation on the lives of the people.

See also *Hope in a Changing Climate*. This companion film combines a short overview of the restoration of the Loess Plateau with success stories from Ethiopia and Rwanda. These successes demonstrate that ecosystems that have been reduced to wastelands for decades, or even centuries, can be revived. These projects, Liu suggests, can help stabilize the earth's climate, eradicate poverty, and make sustainable agriculture a reality.

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Lessons of the Loess Plateau



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WHY I CHOSE THIS FILM

This documentary highlights the connection between soil, vegetation, and humans, as well as the balance needed among the various components of the ecosystem to guarantee land fertility, provide food security, and prevent famine. I chose this film because the role of soils in securing our well-being is frequently underestimated or ignored. Most people are not aware that soil health results in human well-being through the soil's effect on the water cycle, food production, erosion control, and other essential ecosystem services. Additionally, this film reports on a successful land restoration story, which brings hope to those who feel that human-caused ecosystem degradation is too advanced to be remediated.

SUGGESTED SUBJECT AREAS

Ecological Restoration	Global Studies
Environmental Science	Media Studies
Food Justice	Soil Science
Geography	Sustainability

SYNOPSIS

The film *Lessons of the Loess Plateau* describes the impressive ecological restoration of the Loess Plateau region of China, which began in the mid-'90s and took approximately 20 years. This is a region of enormous historical relevance, being the birthplace of the Han Chinese and the headwaters of the Yellow River, yet it is also a stunning example of how centuries of poor land management and overexploitation have resulted in large-scale land degradation that has caused generations of Chinese to suffer from famine and poverty.

Concomitantly, this movie reports on an unlikely success story, one that demonstrates how cooperation, knowledge, and goodwill can change the course of history. The Loess Plateau, once degraded, now supports healthy agricultural practices, the economic development of its inhabitants, and essential ecosystem services.

THE ENVIRONMENTAL JUSTICE FOCUS OF THE FILM

Land degradation is now recognized as a worldwide problem that threatens the livelihoods of entire communities and affects entire regions. It also leads to food insecurity and the unequal distribution of resources, two of the most pressing environmental justice issues that civilization is currently facing. The film, through the narration of villagers, clearly shows the connection between environmental justice and land use, offering clear examples of how land degradation can affect entire generations.

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This is the result of thousands of years of agricultural exploitation and overgrazing.

REVIEWS

“Woefully underpublicized, the \$500 million enterprise transformed an area of 35,000 square kilometers on the Loess Plateau—roughly the area of Belgium—from dusty wasteland into a verdant agricultural center. The result of careful terracing, replanting of native vegetation, and restrictions on grazing, the rejuvenated land now supports a thriving local agricultural economy. Even better, the new vegetation reduces flooding and dust storms by anchoring the region’s soil, and it is becoming a large carbon sink.” —Paul Mozur, *New York Times*, December 9, 2009

BACKGROUND

China’s Loess Plateau is a vast region stretching 640,000 square kilometers across North Central China, an area roughly the size of France. This region, once covered in vegetation and highly productive, has experienced extensive degradation and desertification. As a consequence, the soil, previously fertile and effective at retaining moisture and preventing erosion, now cannot sustain the needs of local villagers because it has lost organic matter, which confers soil fertility and retains moisture. The now-degraded land is subject to prolonged droughts, and when rain events occur, the soil can no longer retain the precious moisture, leading to erosion and flooding that further devastate the area.

Tales told by local villagers describe years of hardship, poor nutrition, food insecurity, and chronic poverty. The reality that local and international officials and scientists discovered when they surveyed the area was discouraging. It took years to develop a complex restoration strategy. The ultimate solution included giving local villagers a voice during the decision-making process and a key active role during the restoration and management of the land. Land use rights were introduced, and locals were compensated for their contribution to the restoration efforts.

The increased productivity of the land, together with reduced flooding and improved water retention, has brought unexpected economic development to the people who cultivate it.

Through the concerted efforts of Chinese and international institutions and local communities, now an area of approximately 35,000 square kilometers has regained productivity and brought economic benefit to locals. This large-scale land restoration success story extends beyond the confines of the Loess Plateau to downstream flood reduction and climate change mitigation.

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KEY LOCATIONS AND PEOPLE

Loess Plateau, China

Hojaigou village, Shaanxi province

Liu Deng Fu – a villager who moved to the Loess Plateau as a child, when his family escaped famine and hoped to find more fertile grounds

Zhang Fang – a villager who endured a life of hardship because of degraded environmental conditions that led to food scarcity

Li Shou Fu – a villager who describes how the prolonged drought and lack of fertile land had an impact on his family

Jürgen Vögele – an officer of the World Bank who worked with villagers and local institutions to find viable strategies to bring fertility and food security back to the region

FILM CHAPTERS OR SEQUENCES

The first segment (00:00–5:58) offers some background on the formation and ancient history of the Loess Plateau. It is the birthplace of the Han Chinese and was a place that once flourished.

The second segment (6:03–7:37) describes practices that, over the centuries, have led to extensive land degradation, poverty, and food insecurity. This segment describes what officials first found when they were tasked with finding a solution to such destruction.

The third segment (7:37–12:16) offers a glimpse into the life of villagers in Shaanxi province, which is the heart of the Loess Plateau. Through the narrations of the villagers, who describe their personal experiences of poverty and famine, the viewer experiences the devastating effects of land degradation on human life.

The fourth segment (12:16–28:00) describes how human activity degraded the once-bountiful environment of the Loess Plateau, and it details the decision-making process that brought together local villagers and international officials. This segment also details the initial challenges to the project and the mixed reaction of villagers when asked to change their traditional agricultural practices.

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The next segment (28:00–41:56) highlights the large-scale benefits of ecological restorations such as the one carried out in the Loess Plateau, including climate change mitigation and flood and erosion control that extend well beyond the Loess Plateau region. The statement “Nature is a system with many interconnected parts” summarizes the guiding principle of ecological rehabilitation, such as the one described in the film.

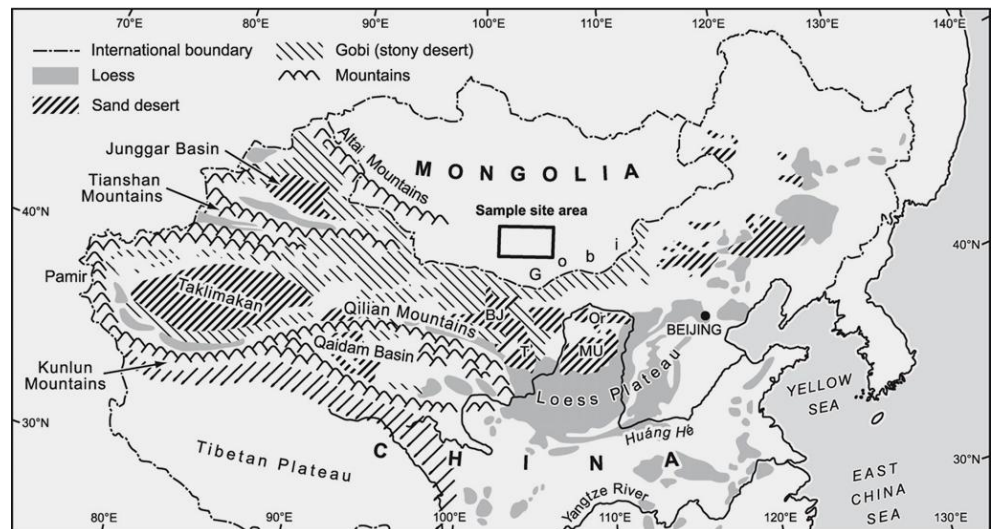
The final segment (41:56–50:32) brings the viewer back to Hojaigou village, where people have witnessed positive changes that were once unimaginable. The segment closes by putting the Loess Plateau restoration success into a global context as a message of hope for humanity as a whole.

DISCUSSION QUESTIONS

1. There are multiple examples across the globe of civilizations that have formed and flourished thanks to the benefits derived from a fertile soil. Look for a few relevant examples and try to identify the origin of such critical soil fertility.
2. Soil in the Loess Plateau has been a resource not just for food but also for shelter. Around the globe there are numerous similar examples, such as the Mesa Verde dwellings developed by Ancestral Puebloans in what is now Colorado, or the Cappadocia region in Central Anatolia, Turkey. Locate other examples and reflect on how modern society has become disconnected from the value of soils and land.
3. In the movie (20:22–20:33), the concept of *ecosystem functions* is introduced. The concept is then further developed in subsequent passages. Explore the concept of ecosystem functions and locate a few examples.
4. Using the explanation provided in the movie, explain how dust originating in the vast Loess Plateau contributes to climate change.
5. At 12:08 in the movie, floods and droughts are mentioned as climatic events that have exacerbated the already desperate conditions of the people living in the Loess Plateau. Can you see any parallel to the warnings being issued today about climate change and its predicted repercussions on specific regions and/or groups? Specifically, discuss how the risk of flood and prolonged drought can pose a risk in terms of food security.

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6. Why did local villagers introduce grazing animals, especially considering that this practice exacerbated the already severe degradation of the land? Can you find similar examples from other parts of the world?
7. Can you describe why it was essential to have the full participation of the local people for the restoration to be successful? Explain what specific strategies were adopted to instill a renewed sense of ownership among the local population.
8. In the film, an old man says, “They want us to plant trees everywhere, even on the good land. What about the next generation? They can’t eat trees.” This reaction is emblematic of how short-term needs of people mired in poverty may hinder long-term restoration efforts. Explain this concept and discuss what convincing argument you would use with this man.



Geological Society of America



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SHORT VERSION

There is a 13-minute summary of the restoration of the Loess Plateau at the beginning of the companion film, *Hope in a Changing Climate*, directed by the same filmmaker. If time is short, this clip offers a very informative description of the ecological threat caused by centuries of overexploitation, and it describes how engineers worked with locals to successfully rehabilitate the land and improve the livelihoods of the villagers.

QUESTIONS RELATING TO THE SHORT VERSION

1. Much emphasis is given to the role of vegetation, especially trees, in restoring ecological balance and remediating damage caused by drought. Explain the role of trees in the hydrological cycle.
2. Engineers, along with local and international officials, developed a strategy to rehabilitate the region. What are its key elements as described in the film?
3. Can you think of other situations or geographical areas where there is a strong connection between damaged soils and poverty? Can you describe this connection?



ACTIVITIES

1. To better understand the role of vegetation in preventing erosion, students can build an erosion model based on the example provided by the Soil Science Society of America. Download their pdf [here](#). The setup can be easily achieved without the need for expensive lab equipment.
2. Another activity involves asking the students to familiarize themselves with the concept of *permaculture*, which is an approach to agriculture that is intended to work with, rather than against, nature through a set of agricultural design principles that directly mimic how natural ecosystems work. The activity can include the short (5:15) video [Permaculture Principles in Application](#) featuring Geoff Lawton. Lawton, who is from Australia, demonstrates how he was able to convert deserts and dry areas into productive land around the world. Students can then engage in a discussion of the differences between conventional agriculture and permaculture as well as the pros and cons of permaculture, especially if applied to large areas.

3. For those interested in learning more about farming techniques and approaches that support and promote ecosystems' well-being without sacrificing productivity, I recommend the film *Final Straw: Food, Earth, Happiness*. This film is included in the Global Environmental Justice documentaries collection.

SUPPLEMENTAL MATERIAL

An additional valuable example of the ecological relevance of single ecosystem components to secure ecological functions can be found in the documentary *Wolves of Yellowstone*:

<https://www.nationalgeographic.org/media/wolves-yellowstone/>.

This brief video, found at

<https://www.youtube.com/watch?v=h8hm8xVoUgw>, describes the formation and current challenges of the Iowa loess and offers a “local” comparison to the massive Loess Plateau described in the documentary.

As a comparison to *Lessons of the Loess Plateau*, and to offer an opportunity to reflect on how policy and human attitude toward nature can shape the environment around us, it would be instructive to watch the film *Waking the Green Tiger*. It offers examples of ecosystem destruction during the Great Leap Forward and the Cultural Revolution, well symbolized by the official slogan at the time: “Man Must Conquer Nature.” This film is included in the Global Environmental Justice documentaries collection.

An interesting read for those who want to better understand land degradation, its geographical extent, and ways to control it is the 2005 article by G. Gisladdottir and M. Stocking titled “Land degradation control and its global environmental benefits” in *Land Degradation & Development* journal, 16: 99–112.