

HOT NEWS





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Interview: Growing Threat of Desertification in Spain Due to Climate Change, Intensive Farming, Says Expert



Up to 75 percent of the Spanish territory is susceptible to desertification, according to the country's Ministry for Ecological Transition.

BARCELONA, Spain, July 30 (Xinhua) -- The threat of desertification in Spain is growing due to climate change and the intensive pressure of land use, a Spanish expert told Xinhua in an interview on Tuesday.

Gabriel del Barrio from the Spanish National Research Council's Experimental Station of Arid Zones (EEZA) said: "The amount of land under active degradation has tripled in just ten years. This will continue to grow because the land is being subjected to very intense use in order to extract the vegetables and other agricultural products necessary for a socioeconomic dynamic that is overheating the system."

Nevertheless, the researcher explained that the term desertification can be misleading as it suggests that the land affected by the phenomenon could become desert. He insisted that "there will never be a desert in Spain."

Deserts are complex functioning ecosystems that have evolved over millions of years, he said,

adding: "What we are talking about is degraded land, which is a different thing."

Desertification refers to the permanent degradation of arable land in arid, semi-arid and subhumid areas, due to intense pressure from farming, urbanization and climate change.



The United Nations Educational, Scientific and Cultural Organization (UNESCO) warned earlier this month that 90 percent of the planet's land surface could become degraded by 2050. Up to 75 percent of Spanish territory is "susceptible to desertification", according to the country's Ministry for Ecological Transition.

Meanwhile, the EEZA reports that the percentage of land in Spain that can be classed as degraded currently stands at 24.6 percent.

The Spanish government has warned that higher temperatures have caused arid climates to double since the mid-20th century, at an annual rate of about 1,500 square kilometers per year. As Del Barrio said, "An increasingly arid climate undermines the resilience of ecosystems and makes it harder for them to recover." At the same time, the effect of climate change "increases the intensification of human activity", such as the expansion of irrigation systems into dryland areas. Some 22 percent of irrigated land is considered degraded or very degraded, according to Del Barrio.

Spanish authorities say that 79 percent of the country's water resources are used for agriculture and livestock farming.

"Land degradation is inherent to our presence in the world, but we can do some things to try to



control it. We can, for example, respect the cycles of production and renewal of the natural resources that replenish slowly," said the researcher, referring to underground water reserves known as aquifers.

The intensification of agricultural land use is the principal cause of land degradation, according to Del Barrio. The dynamic of the current market "forces farmers to produce in excess" in order to satisfy the strict demands of large food distribution chains.

In today's globalized world, the effects of land degradation can also be felt across continents. Del Barrio cited the phenomenon of telecoupling, which refers to socioeconomic and environmental interactions over long distances.

"The areas in Spain of intensive agriculture and livestock farming are importing fodder produced in South America, which is at the expense of degrading native forests in regions of the Amazon, so the relationships are becoming increasingly complex," he said.

UNESCO also sees land degradation and desertification as a global issue, and stresses the importance of fertile soil in maintaining ecosystems and biodiversity. It has warned that 75 percent of soils are already degraded, affecting 3.2 billion people.

Details: https://english.news.cn/20240730/f11934cd3a194ed7b3442e4f7c4f6225/c.html

Erosion Following Wildfire has Increased in California Since 1984



In a first-of-its-kind study, scientists compiled one year's worth of soil and sediment erosion quantities occurring after large California wildfires between 1984 and 2021.

SANTA CRUZ, Calif. – In a first-of-its-kind study, scientists compiled one year's worth of soil and sediment erosion quantities occurring after large California wildfires between 1984 and 2021. Scientists found that postfire erosion has accelerated over time, particularly in northern California, likely reflecting both the increase in wildfire in the state and the frequency of wet water years. In addition, scientists found that 57% of postfire erosion by mass occurred upstream of reservoirs. This research helps planners understand the degree to which postfire erosion has impacted watersheds and can inform management actions to minimize the effects of runoff on clean water storage. Using the Water Erosion Prediction Project model developed by the USDA Forest Service, in combination with field-based debris-flow volume measurements and modeled debris-flow volumes, scientists from the USGS and California Geological Survey evaluated postfire erosion throughout California for 196 large wildfires, which includes fires over 100 km2,~25,000 acres, in California between 1984 to 2021.

Researchers estimated the magnitude of erosion contributed by postfire debris flows and

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hillslope erosion in the first water year following wildfire. Results show that postfire debris flows can mobilize vastly more sediment than hillslope erosion processes. As climate change exacerbates hillside erosion, it has become more common and could create more of a downstream hazard for water resources. Examples of this include the filling of storage space in reservoirs and damaging infrastructure as 'nuisance' sediment that blocks roads and culverts.

Results from the study show a tenfold increase in postfire hillslope erosion between 1984-1990



and 2011–2021 in northern California, with the majority of top sediment-producing fires occurring in the last decade.

The team of researchers reviewed published studies of the Water Erosion Prediction Project model's accuracy in application to burned areas and conducted their own tests comparing model output to field data. Results showed that the model often over-predicts erosion where little erosion has occurred and underpredicts erosion where significant erosion occurred, particularly in watersheds with greater burn severity.

Researchers acknowledged that targeting erosion in just the first water year following wildfire

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may underestimate postfire erosion, as those effects may last for several years.

Because fire extent and burn severity are projected to increase alongside extreme rain with ongoing climate change, postfire sediment mobilization will be a growing risk to water-resource security, as well as riparian, coastal, and marine ecosystems and communities.

Details: https://www.usgs.gov/news/state-news-release/erosion-following-wildfire-has-increased-california-1984

In the Brazilian Amazon, Seedlings Offer Hope for Drying

- In Brazil's Maranhão state, the advance of monoculture and decades of forest destruction have driven a shift in precipitation patterns, diminishing rains and drying out springs that feed important rivers.
- This represents a major threat for the Guajajara Indigenous people, for whom these springs hold spiritual significance and guarantee the health of the rivers they depend on for fishing, bathing, drinking and cultural rituals.
- In an effort to restore drying springs, Indigenous people in the Rio Pindaré reserve are mapping headwaters and planting species native to the Amazon rainforest like buriti, pupunha and açaí palms along their margins.
- Scientists say this type of reforestation could help restore balance to water cycles in the region, mitigating the broader impacts of drought and climate change.

In the Rio Pindaré Indigenous Territory of Brazil's Amazon rainforest, the Guajajara community is reviving crucial headwater springs threatened by deforestation and climate change. By replanting native Amazonian species like buriti and pupunha around dwindling springs, the Guajajara aim to restore their ecological balance and preserve their sacred water sources vital for livelihoods, rituals, and cultural identity. This effort represents a traditional approach to combat environmental degradation, ensuring the rivers' flow for fishing, drinking, and bathing, while safeguarding the Guajajara's future and cultural heritage.

Legacy of destruction

Deep in the shadows of the rainforest, there is no sign of the drought parching the dusty soy fields that stretch for miles beyond the Rio Pindaré reserve. Here, the air is sticky and damp. Insects move in dense swarms and animals rustle in the bush. Rice, cassava and banana grow plentiful, alongside forest species like açaí.

The Rio Pindaré Indigenous Territory stretches some 15,000 hectares across the municipality of Bom Jardim in Maranhão state. Under federal protection since 1982, it lies in an ecological corridor made up of seven reserves, some of them home to Indigenous people living in voluntary isolation from the outside world.

After decades of destruction, most of the rainforest around has succumbed to large-scale agriculture. Yet, despite frequent incursions by outsiders over the years, Rio Pindaré remains an island



of rainforest, intact in the face of frenzied development.

"This is the last of the forest here," said a Funai official who asked to remain unnamed because he is not authorized to speak to the media. "And the Indigenous people depend on it. This is why it's so important to protect it."

This corner of the Brazilian Amazon was mostly isolated until a few decades ago, when the military regime that came to power in the 1960s pushed to populate it as a way of guaranteeing its sovereignty. Dubbing it "land without men for men without land," it handed out plots of lands to thousands of migrants from other corners of Brazil and, over the next two decades, built a series of roads slicing through the rainforest.

One such project was the BR-316, a 2,000-kilometer (1,243-mile) federal highway that slashed the Rio Pindaré reserve in half. The road opened up access to the pristine forest like never before, drawing illegal loggers who could now travel deeper into the Guajajara people's lands in search of valuable tree varieties.

"The impact was huge," said Caroline Yoshida, a technical adviser at the Institute of Society, Population and Nature, a nonprofit working with Indigenous groups in the region. "Because the road cuts right in the middle of their land. With that, the wild game diminished, the pressure on their territory increased."

In the 1980s, the construction of the Carajás Railroad, spanning 891 kilometers (554 miles) from Maranhao's capital to the neighboring state of Pará, further intensified the wave of migration and created a new frontier of deforestation in the region. Before long, logging hubs were springing up around Rio Pindaré.



In recent decades, the incursions into Rio Pindaré have continued, with settlers from needy villages on the other side of the river regularly invading the territory to illegally hunt and fish, according to Indigenous people and authorities.

"Some of these communities around here, they don't want to respect this land as being for the exclusive use of Indigenous people," the agent said. "There is this thinking, why give so much land to them?"

Beyond the territory, meanwhile, monoculture has taken over large swaths of this region. Soy, corn and cattle drive the local economy here, with unwavering support from powerful politicians and lobby groups.

With native vegetation receding, Indigenous people are feeling the pressure, as forests, rivers

and springs within their own territories grow dryer, Yoshida said.

"They're reforesting so they can maintain these springs, so that they don't die within the territory," she said. "So that they don't lose this wealth that they have within the territory."

A treasure at risk

Headwater springs play a pivotal role in the water cycle and are fragile, making them susceptible to climate shocks such as drought. These springs, which emerge from groundwater reser-



voirs, contribute to the formation of larger waterways. The Amazon rainforest faces a water crisis, with longer dry seasons and scarce rainfall exacerbating the situation. The reduction in precipitation affects headwater springs, and restoring them fully once dried up is uncertain. Preserving and protecting existing springs is crucial due to the lengthy and complex process of restoring their biodiversity and ecological balance. Planting native species around headwaters strengthens soil and prevents erosion, facilitating natural water filtration and replenishment. Restoring native forests globally, including those around Amazon headwaters, is essential for mitigating climate change and maintaining the hydrological cycle. Protecting and restoring these areas represents a vital investment in safeguarding the Amazon's water resources.

Details: *https://news.mongabay.com/2024/08/in-the-brazilian-amazon-seedlings-offer-hope-for-drying-rivers_trashed/*



NPC Deputy Spends Life in Sand Control, Shedding Light on Greening Efforts

In the arduous battle against desertification, Shi Guangyin, 72, Party chief of Shilisha village of Dingbian county in Yulin city, Northwest China's Shaanxi province, has dedicated over 40 years of his life to combating sandstorms and establishing a "Green Great Wall" in desolate lands. In Yulin, a key area in China's Three-North Shelterbelt Forest Program that was initiated by the Chinese government in the 1970s to improve the ecological environment in northern China, Shi, a deputy to the Yulin Municipal People's Congress, has led his community in planting over 53 million trees across 250,000 mu (17,000 hectares) of barren land, transforming 350,000 mu of land into lush greenery.

Desertification poses a significant global ecological challenge that affects human survival and development. China is one of the most severely affected countries. Historically, Yulin has suffered extensive ecological degradation, with vast forests being decimated and barren land merging with the Mu Us Desert. In the 100 years prior to the founding of the People's Republic of China in 1949, Yulin saw six towns, 412 villages, and 2.1 million-mu farmland swallowed by drifting sands.In such harsh conditions, Shi's father relocated his family nine times to evade the encroaching sands.

Driven by the desire to secure a better future for generations to come, Shi embarked on an anti-

desertification mission at a young age. "Combating desertification is for our descendants. We've endured the hardships of desertification too much; we cannot let our children suffer the same fate," he said.

In 1968, 16-year-old Shi was elected as the production team leader of Getatao village in Haiziliang commune. His first task was to mobilize the community in tree planting efforts, resulting in the successful cultivation of 14,000-mu trees in three years, the first green achievement in Haiziliang.In 1984, encouraged by the policies supporting individual initiatives in combating desertification, Shi resigned from his position as farm manager — a stable government job that guaranteed a living that referred to as an "iron rice bowl", relocated to the desert, and signed a contract with the local government to curb desertification and soil erosion on 3,000 mu of land, becoming the country's first farmer to undertake desert control efforts. Shi was convinced that without tackling desertification, poverty would persist; only by restoring the land and improving the environment could the root cause of poverty be addressed.

With the initial funding of 130,000 yuan (\$18,200) for seedlings, which was painstakingly gathered by Shi and his six partner farmers, they planted drought-resistant willows and poplars on the contracted desert land. After a year of hard work and favorable rainfall, the survival rate of the saplings exceeded 85 percent. This initial success bolstered Shi's confidence.In 1985, Shi boldly expanded his efforts by signing a contract with Changmaotan Forest Farm to control sand on 58,000-mu land. He set up a sand-control company and collaborated with 482 individuals from 127 households in neighboring areas.

However, the survival rate of the saplings was not as high as he had expected. Facing repeated failure, Shi made up his mind to learn new methods, and finally fixed the drifting sand in the third year. Where trees thrived, drifting sands surrendered, and fertile farmlands, once buried under sand dunes, were reclaimed. Crop yields soared, farmers' incomes increased, and the region was transformed into a bountiful granary.

Shi's unwavering commitment to desert control and afforestation has seen desert land recede and lush land flourish, inspiring more people to join the cause of desert control. Today, nearly 80 percent of the Mu Us Desert in Yulin is covered in vegetation, soil erosion has been effectively prevented and the desert is likely to become China's first "vanished" desert.Under the efforts of Shi and his community, 250,000 mu of barren land have been reclaimed over the past four decades. What was once a desert landscape now blooms with fertile fields, serving as a prosper-

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ous granary in the region, and the income of local residents has been increased too.

For Shi, desert control not only means to survive, it is also for development. He and his team have pioneered an integrated development model encompassing anti-desertification, sapling cultivation, livestock farming, and eco-tourism. They have also established over 10 economic entities such as a forest farm, a demonstration cattle ranch, a feed processing plant, a forestry training center, and a lake-themed tourist attraction. These initiatives have significantly boosted the average income of local farmers.In 2018, Shi was elected as a deputy to the 13th National People's Congress, a testament to his dedication of serving the people. In the following five years, he proposed suggestions on forestry industry development, desertification control, and the Three-North Shelterbelt Forest Program, with a steadfast commitment to environmental improvement.



Today, as a fifth-term deputy to Yulin Municipal People's Congress, Shi continues to work on the frontline of public service. He said that the mission of a deputy to the people's congress is to address the people's difficulties and deliver tangible results. His words brim with determination and vigor, showcasing his enduring dedication.

Details: https://www.chinadaily.com.cn/a/202409/02/WS66d57884a3108f29c1fc9a5a_1.html

Shifting Sands: The Role of CoralReefs in Coastal Erosion



In a recently published study, researchers from the University of California, Santa Cruz, and USGS investigate how coral reefs affect shoreline erosion in the Hawaiian Islands. By analyzing decades of coastal data, the study finds that coral reefs play a crucial and complex role in coastal dynamics, offering significant protection during storm events while reducing long-term erosion in most cases.

Reefs Protect Shorelines During Storms

The study highlights the vital protective role that coral reefs play in safeguarding tropical beaches from erosion during storm events. Beaches shielded by coral reefs experienced 97% less beach volume loss compared to those without such protection. This finding underscores the importance of healthy coral reefs in mitigating both the destructive effects of storms – which are becoming increasingly frequent and intense due to climate change – and long-term coastal erosion.

Long-Term Erosion: A Complex Picture

While reefs offer short-term shoreline protection during storms, the study's long-term analyses present a more nuanced view. By examining more than 80 years of data on coastal erosion rates, bathymetry, habitat, and wave energy across Kaua'i, O'ahu, and Maui, researchers found that

coral reef structure and wave energy significantly influence long-term shoreline erosion. Specifically, beaches protected by reefs with shallow reef crests, wide reef flats, and calm offshore conditions tend to erode more slowly over time.

However, an unexpected pattern emerged when comparing historical erosion rates: coral reefprotected beaches sometimes erode up to twice as fast as their unprotected counterparts. The researchers suggest that this finding may be linked to the degradation of coral reef structures and rising sea levels, which are altering the natural equilibrium of these coastal environments.

Implications for Coastal Management

Coral reefs' role in coastal erosion is complex and may require more nuanced management approaches. The researchers suggest that future studies should expand to other regions, employ advanced sediment transport models, and conduct field experiments to better understand the interplay between coral reefs and tropical shoreline dynamics.

Details: https://www.usgs.gov/centers/pcmsc/news/shifting-sands-role-coral-reefs-coastal-erosion

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