

# Unique geomorphology of Rig-e Yalan Desert

**Iranica Desk** Rig-e Yalan, situated in the eastern expanse of the Lut Desert, is one of Iran's most remarkable natural wonders. Its immense scale, towering sand formations, and distinctive ecological importance have drawn the interest of both scientists and travelers alike. Spanning approximately 10,000 square kilometers, Rig-e Yalan marks the convergence of three provinces: Sistan and Baluchestan, Kerman, and South Khorasan. It stands out as one of Iran's largest reserves of sand dunes.



● IRNA

## Geomorphological features

The region is characterized by a vast array of sand hills and towering pyramids sculpted by relentless winds and soil erosion, with heights surpassing 400 meters. It makes Rig-e Yalan not only the tallest sand formation in Iran but also one of the highest globally, [chtn.ir](#) wrote.

Mohammad Reza Ahmadi, a professor of natural geography at the University of Tehran, remarked that this area possesses unique geomorphological features, making it one of the rarest desert ecosystems. The prevailing winds have significantly influenced the formation of these tall and regular sand hills, showcasing the intricate relationship between land and atmosphere. Ahmadi said that investigating climate change impacts and managing water resources in such environments can yield crucial insights into the sustainability of desert ecosystems. Rig-e Yalan exemplifies how wind shapes sand structures; seasonal winds, particularly the notorious 120-day winds from Sistan, have transported fine grains of sand over time, resulting in the creation of these impressive pyramids.

Research indicates that wind speeds in the area can occasionally reach up to 70 kilometers per hour, leading to specific patterns in sand accumulation. Ahmadi noted that due to its vastness and strategic location, Rig-e Yalan has the potential to foster positive interactions among neighboring provinces. However, challenges such as soil erosion and a scarcity of shared water resources necessitate collaborative efforts across provincial lines.

## Tourism potential

Despite the harsh conditions typical of desert environments, Rig-e Yalan holds promise as a premier tourist destination. The breathtaking vistas formed by its sand dunes, coupled with stunning sunrises and sunsets and the profound silence of the desert, create an alluring experience for nature lovers and photographers alike.

Tourism expert Reza Hosseini believes that Rig-e Yalan has significant potential for sustainable tourism development. He emphasized that attracting both domestic and international visitors is feasible through adequate infrastructure provision — such as accommodation camps, professional guides, and safe pathways.

Hosseini also underscored the importance of educating local communities on how to host tourists while preserving the environment. Nevertheless, Rig-e Yalan faces various environmental challenges. Climate change effects, diminished rainfall, and rising temperatures pose serious threats to this delicate ecosystem.

Ahmadi acknowledged these vulnerabilities and stressed that managing water resources effectively and curtailing irrespon-

sible human activities are critical issues requiring attention.

He pointed out that increased use of off-road vehicles and unsustainable mineral extraction practices could severely damage sand structures and disrupt local biodiversity. Beyond its appeal to tourists, Rig-e Yalan captivates researchers; it serves as a natural laboratory for studying wind dynamics, soil erosion processes, and climate change phenomena. Ahmadi advocated for collaboration among universities and research institutions to conduct joint projects in this region to gather more precise data on Iran's desert ecosystems.

## Conservation efforts

Hossein Eslami, director of the Lut Desert World Heritage Site, said that approximately 20% of Rig-e Yalan lies within Sistan and Baluchestan Province. The area is celebrated as one of Iran's most beautiful desert landscapes, attracting nature enthusiasts and professional tourists alike. The Lut Desert was designated a UNESCO World Heritage Site in 2016, highlighting the significance of protecting this natural treasure.

In response to queries about conservation strategies for Rig-e Yalan, Eslami outlined key actions aimed at establishing boundaries to prevent encroachments into the Lut Desert. These efforts are supervised by the Lut World Heritage Site alongside Iran's Cultural Heritage Ministry and UNESCO. Training programs are also underway to raise awareness about responsible tourist interactions while preventing environmental degradation.

Eslami noted that several initiatives have been developed to attract both domestic and international tourists. These include comprehensive tourism plans and infrastructure improvements aimed at fostering sustainable development while enhancing economic benefits for local communities. Regarding mitigating negative impacts from human activities, he reassured that no significant damage has been reported in Rig-e Yalan thus far. Access is restricted primarily to professional tourists, with mining activities occurring outside desert boundaries under continuous monitoring. He also highlighted ongoing scientific research in Rig-e Yalan which remains in its early stages; it focuses on geographical, anthropological, and archaeological studies aimed at formulating more effective sustainable tourism strategies by gaining a deeper understanding of the region's history and culture. Local communities play an essential role in protecting this area; they have historically utilized and preserved its natural resources.

## Community engagement and future planning

Training sessions for village leaders and

community members have been organized to facilitate better tourist interactions while capitalizing on economic opportunities presented by tourism. Eslami emphasized that any planning or actions regarding water resource management must be coordinated with approval from the Ministry of Cultural Heritage. Fortunately, no destructive activities threatening Rig-e Yalan's ecosystem have been reported thus far.

Training programs for tour operators are integral to initiatives at the Lut Desert World Heritage Site; these aim to ensure guides engage professionally while respecting environmental considerations during tours. In response to inquiries about fostering international collaboration, Eslami stated that strengthening scientific cooperation is a priority for conducting more comprehensive research in the Lut Desert. Such partnerships can enhance protection efforts while optimizing resource utilization.

Rig-e Yalan symbolized Iran's desert beauty with its stunning landscapes and unique natural features. This area holds immense potential for tourism development, research opportunities, and regional collaboration; however, safeguarding this sensitive ecosystem requires meticulous planning and inter-sectoral cooperation to preserve this invaluable natural asset for future generations.

## Overview of Lut Desert

The Lut Desert, known as Dasht-e Lut in Persian, is a vast and hyper-arid region located in southeastern Iran, spanning approximately 51,800 square kilometers. It is recognized as one of the hottest places on Earth, with surface temperatures recorded at an astonishing 70.7°C (159°F). The extreme heat is a result of its geographical position within an interior basin surrounded by mountains, creating a rain shadow effect that contributes to its hyper-arid climate. The desert is characterized by a diverse array of geological formations, including towering sand dunes, unique yardangs — bedrock features shaped by wind erosion — and expansive salt flats. Divided into three distinct geographical sections — northern Lut, central Lut, and southern Lut — the desert showcases a variety of landforms and ecosystems.

Northern Lut Desert features gravel and sand elements, while Central Lut is renowned for its dramatic kaluts (natural ridges formed through erosion), massive sandy dunes, and other stunning geological phenomena. Southern Lut supports the richest vegetation in the region, demonstrating the resilience of life in such an extreme environment.

The Lut Desert's remarkable landscapes not only attract tourists but also serve as a natural laboratory for scientific research focused on wind dynamics, climate change, and desert ecology.

