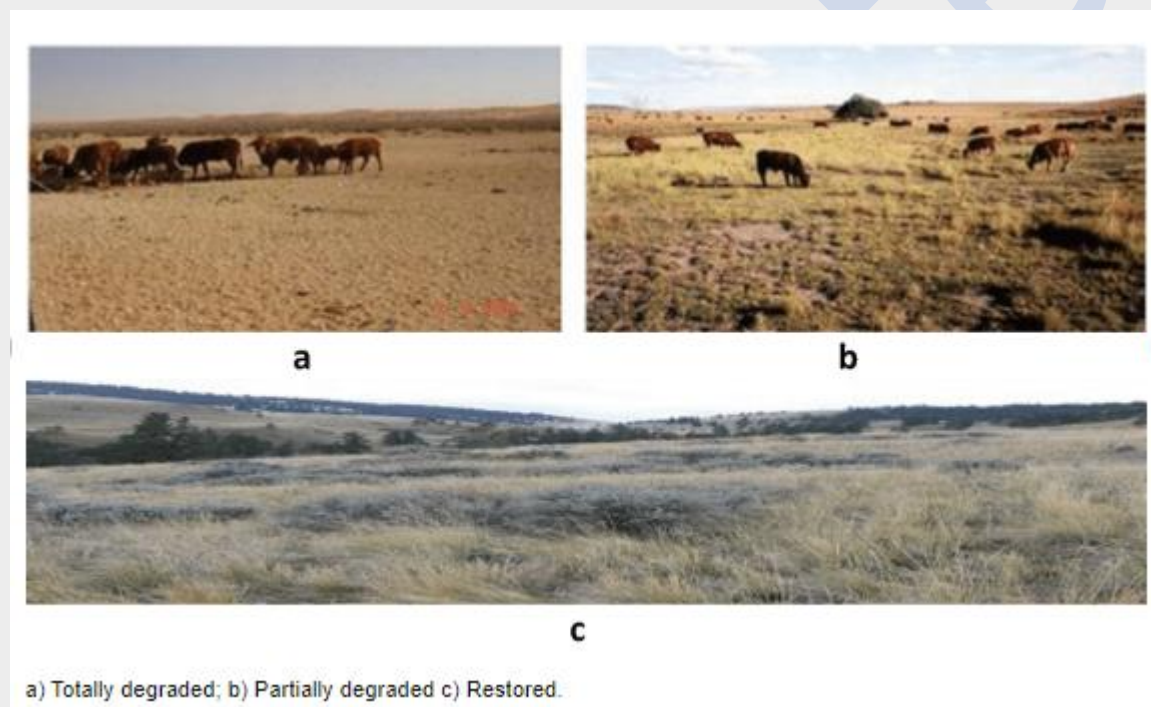


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1. Half of world's rangelands are degraded, UN study finds: What are rangelands, why they matter

Why in News?

About half of the world's rangelands are degraded and need policy interventions, and communities depending on them need focused support, according to a new report of the United Nations Convention on Combating Desertification (UNCCD).



What are rangelands? Why are they important? What does the UNCCD report find?

What are rangelands?

The UNCCD report defines rangelands as natural or semi-natural ecosystems that are grazed by livestock or wild animals. Rangelands contain vegetation such as grasses, shrubs, bushes, open forests, and agroforestry systems (land which contains trees and crops or pastures).

Currently, rangelands cover 80 million sq km of Earth's terrestrial surface area (over half of Earth's land), and are thus the largest land cover or land use type in the world. They act as carbon sinks (which absorb more carbon from the atmosphere than they release), storehouses of freshwater, and prevent desertification of land. Millions of people worldwide depend on rangelands for food security, and livelihoods.

Rangelands generate 16% of global food production and 70% of feed for domesticated herbivores. In India, rangelands occupy about 1.21 million sq km, from the Thar Desert to Himalayan meadows.

What does the UNCCD report say?

The UNCCD report found that nearly 50% of the world's rangelands can be considered "degraded" and are facing a "silent demise".

Climate change, unsustainable land and livestock management practices, biodiversity loss, and the conversion of rangelands to farmlands are some of the primary drivers of rangeland degradation. Uncertainty over land rights among pastoralist communities, who depend on rangelands for their livelihood, also leads to their degradation.

This, in turn, severely affects the communities dependent on rangelands as their deterioration impacts soil fertility and biodiversity, leading to a dip in incomes and rise in conflicts with authorities over grazing rights.

Who are pastoralists?

Pastoralism is a livelihood system based on livestock production. This includes livestock rearing, dairy production, meat production, wool production, and leather production.

The communities and groups, both indigenous and non-indigenous, who are involved in livestock production are known as pastoralists. These communities rear sheeps, goats, cattle, horses, donkeys, camels, yaks, llamas, alpacas, and pigs. Some pastoralist communities also rear ducks and chickens.

Their livelihood is highly dependent on the quality of pasture (or rangelands) they have access to, and their rights over them. However, since they still remain on the margins of society, they have little say in policy-making.

Globally, an estimated 500 million pastoralists are involved in livestock production and allied occupations. In India, while there are no official figures, research and advocacy groups peg their population at around 13 million people, across 46 groups including Gujjars, Bakarwals, Rebaris, Raikas, Kurubas, and Maldharis, to name a few.

What are pastoralists' economic contributions in India?

India is home to 20% of the world's livestock population. Around 77% of these animals are reared in pastoralist systems, meaning they are either herded or left to range on common lands, according to the Accounting for pastoralists in India (2020) report. Pastoralists also protect indigenous livestock breeds, and protect traditional knowledge about animal rearing.

Currently, India is the largest producer of milk in the world, accounting for 23% of global dairy production. It is also the largest producer of buffalo meat and largest exporter of sheep and goat meat. Pastoralists are a major contributor in this sector.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

2. What are AI agents, that power OpenAI's GPT4o and Google's Project Astra?

Introduction

The recently launched GPT-4o by OpenAI and Project Astra by Google have one thing in common: both are capable of processing the real world through audio and visual inputs and provide intelligent responses and assistance. In other words, the new AI models can have instant real-time conversations with a user.

Known as 'AI agents', GPT-4o and Project Astra have been touted as far superior to conventional voice assistants such as Alexa, Siri, and Google Assistant. The launch of these models marks a new phase in AI — the transition from chatbots to multimodal interactive AI agents.

What are AI agents?

AI agents are sophisticated AI systems that can engage in real-time, multi-modal (text, image, or voice) interactions with humans. Unlike conventional language models, which solely work on text-based inputs and outputs, AI agents can process and respond to a wide variety of inputs including voice, images, and even input from their surroundings.

How are they different from large language models?

While large language models (LLMs) like GPT-3 and GPT-4 have the ability to only generate human-like text, AI agents make interactions more natural and immersive with the help of voice, vision, and environmental sensors. Unlike LLMs, AI agents are designed for instantaneous, real-time conversations with responses much similar to humans.

LLMs lack contextual awareness, while AI agents can understand and learn from the context of interactions, allowing them to provide more relevant and personalised responses. Also, language models do not have any autonomy since they only generate text output. AI agents, however, can perform complex tasks autonomously such as coding, data analysis, etc. When integrated with robotic systems, AI agents can even perform physical actions.

What are the potential uses of AI agents?

AI agents can serve as intelligent and highly capable assistants. They are capable of handling an array of tasks, from offering personalised recommendations to scheduling appointments. Reports suggest that AI agents can be ideal for customer service as they can offer seamless natural interactions, and resolve queries instantly without actually the need for human interventions.

In the field of education and training, AI agents can act as personal tutors, customise themselves based on a student's learning styles, and may even offer a tailored set of instructions. In healthcare, they could assist medical professionals by providing real-time analysis, diagnostic support, and even monitoring patients.

Are there any risks and challenges?

While AI agents showcase immense potential for the future, they are not without risks. Privacy and security are a key area of concern as AI agents gain access to more personal data and

environmental information. Just like any AI model, AI agents can carry forward biases from their training data or algorithms, leading to harmful outcomes. As these systems become more common, appropriate regulations and governance frameworks should be laid out to ensure their responsible deployment.

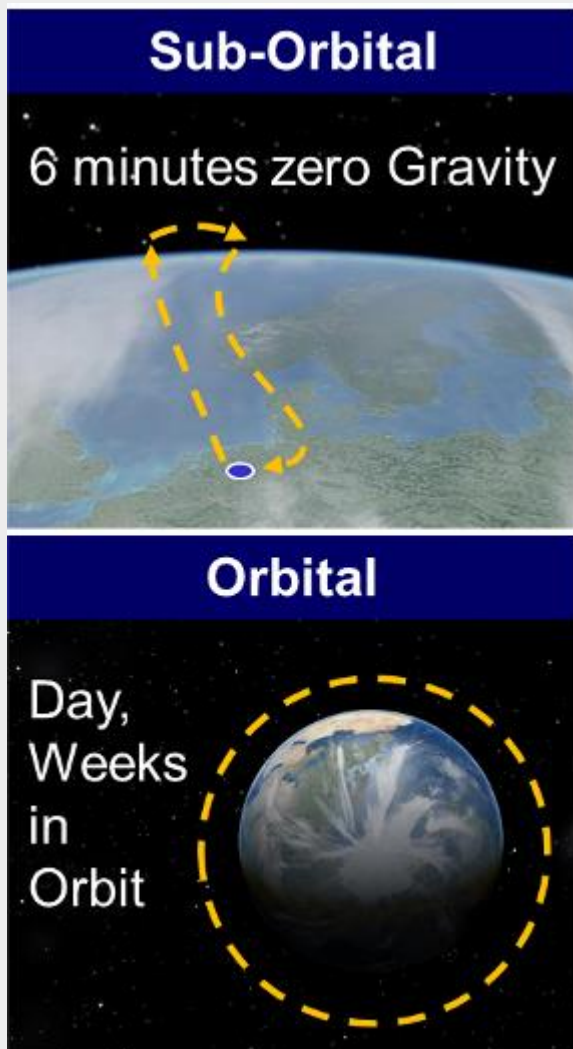
Relevance: GS Prelims; Science & Technology

Source: Indian Express

3. Gopi Thotakura becomes first Indian space tourist: What is space travel?

Introduction

Recently, India-born aviator and commercial pilot Gopi Thotakura along with five other space tourists became the latest set of individuals to make a short recreational trip to space. Thotakura, who is based in the United States, is the first space tourist from India but about 50 others have made such trips, most of them in the last three years.



First Indian space tourist

Thotakura flew aboard a spacecraft of Blue Origin, one of the few private space companies offering a joy ride to people wanting to venture into space. The whole journey, from take off to landing lasted only about ten minutes, during which the spacecraft attained a maximum height of about 105 km from the Earth. The passengers — among them a 90-year-old American — got to experience weightlessness for a few minutes and observe the Earth from a height.

Crossed Karman Line

It was one of the shortest and quickest trips to space. Space travel begins at about 100 km altitude from Earth, after crossing the so-called Karman line, which is widely accepted as the boundary line separating the Earth's atmosphere from outer space. Anything flying below this altitude is called an aircraft while those crossing this line get classified as a spacecraft.

Sub-orbital flight

Thotakura's journey was what is called a sub-orbital space flight. The spacecraft did not get into an orbit around the Earth. It crossed the

Karman line, stayed there for some time, and then descended back to Earth. Most space tourism flights on offer are of this nature only.

But longer joy rides in space are also available. Space tourists have orbited around the Earth, and even spent a few days on the International Space Station (ISS), the permanent space laboratory that goes around the Earth at an altitude of about 400 km.

In fact, the first space tourist, Dennis Tito, an American who paid to travel on a Russian Soyuz spacecraft in 2001, spent over seven days on the ISS. Between 2001 and 2009, the Russians took seven tourists to the space station, and one of them, Charles Simonyi, travelled twice.

However, there was a lull in private space tourism after 2009, till the year 2021 when suddenly it became hyperactive.

Entry of private space players

Three of the leading players in private space tourism — Virgin Galactic, Blue Origin, and SpaceX — executed their first missions in 2021. Within 10 days of each other in July of that year, Virgin Galactic and Blue Origin launched their respective bosses — Richard Branson and Jeff Bezos — into space. Both these flights were suborbital missions, lasting a few minutes just above the boundary line of space, giving their passengers, four of them on each spacecraft, an experience of weightlessness.

SpaceX did not have a mission of its own, but its Crew Dragon spacecraft was chartered by billionaire Jared Issacman to go into space. Issacman and his three co-passengers circled the Earth for three days, becoming the first set of people to orbit the Earth without the help of professional astronauts.

That same year Japanese billionaire Yusaku Maezawa, and two others, boarded the Russian Soyuz spacecraft to reach the ISS where they spent 12 days.

Relevance: GS Prelims & Mains Paper II; Science & Technology

Source: Science & Technology