

18 FEBRUARY 2019

1. The Himalayan glaciers are melting away

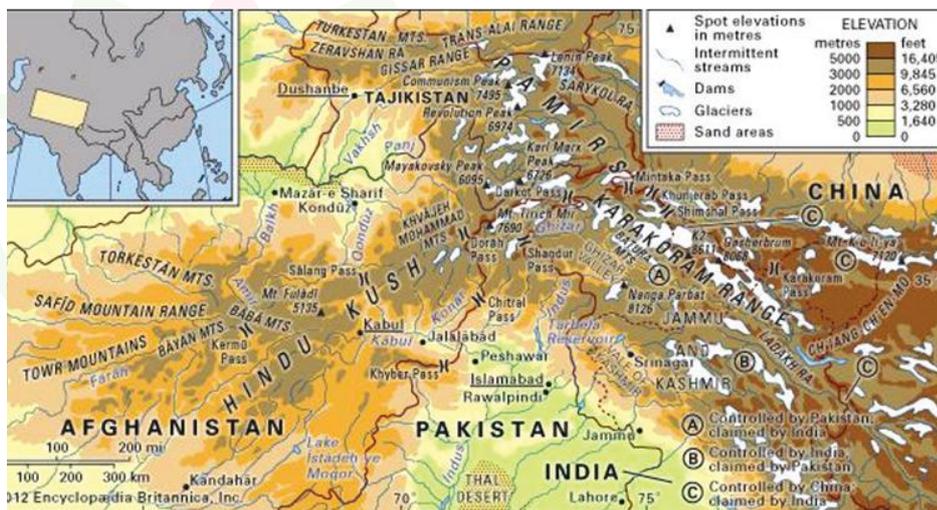
The International Centre for Integrated Mountain Development, an intergovernmental organisation focussed on environmental and social change in Hindu Kush Himalaya. It warned that one-third of the glaciers in the Hindu Kush Himalayan region could disappear by the end of the century — even if the world limits the temperature rise to 1.5 degrees C. And if greenhouse gas emissions continue at their current levels, the region could lose as much as two-thirds of its ice.

Glaciers

Seventy per cent of the earth’s surface is water. Of the remaining 30%, 20% is land and 10% is ice. Most of the ice is in the Arctic and the Antarctic, and the rest is scattered around the world in the form of mountain glaciers. **The Himalaya-Karakoram-Hindu Kush mountain ranges contain the third-largest deposit of ice and snow in the world.**

Glaciers are slow moving ice masses formed over many years of accumulation of snow – the snow that escaped melting and sublimation over the years. Glaciers flow due to stress from their own weight. They abrade rocks on their way and form crevasses. Glaciers form only on land, unlike the much thinner sea ice and lake ice that form on the water surface.

Glaciers store water in the form of ice during the colder seasons and release it during warmer seasons by way of melting. This serves as a water source for humans, animals and vegetation.



Importance of the Hindu Kush-Himalayan glaciers

The **Hindu Kush-Himalayan** region covers some **3,500 km** across **Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan**. There are about 46,000 glaciers in the region, which provide water resources to around a quarter of the world’s population.

The glaciers feed 10 of the world’s most important river systems, including the Ganges, Indus, Yellow, Mekong and the Irrawaddy.

Why are the glaciers melting?

The current report suggests global warming as the primary reason for glacial melt here. It also says the melting could accelerate because of increased air pollution. Air pollution from the Indo-Gangetic Plains also deposits black carbon and dust on the glaciers, hastening the thaw. In general, deforestation, land-use changes, changes in precipitation and decrease in snowfall could also impact the rate of glacial retreat.

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Impact of glacial melt

The changes have a direct impact on freshwater flow. As millions are dependent on this water source, the effect is multidimensional. Drinking water supplies, hydropower, industry, agriculture and biodiversity will all be affected.

When glacial mass melts on a large scale, it contributes to sea level rise. Large quantities of fresh water will be added to the ocean every day.

How will glacial melt affect us in the long run?

The glaciers will initially provide extra runoff from melting, but as the ice diminishes, the runoff will wane.

Glaciers are like reserves which provide water when it is most needed – during the dry season and during times of drought. With the glacial retreat, we could lose this ‘buffer’ eventually. The region that loses glaciers will be subject to erosion and decreased stability.

Glacial lakes

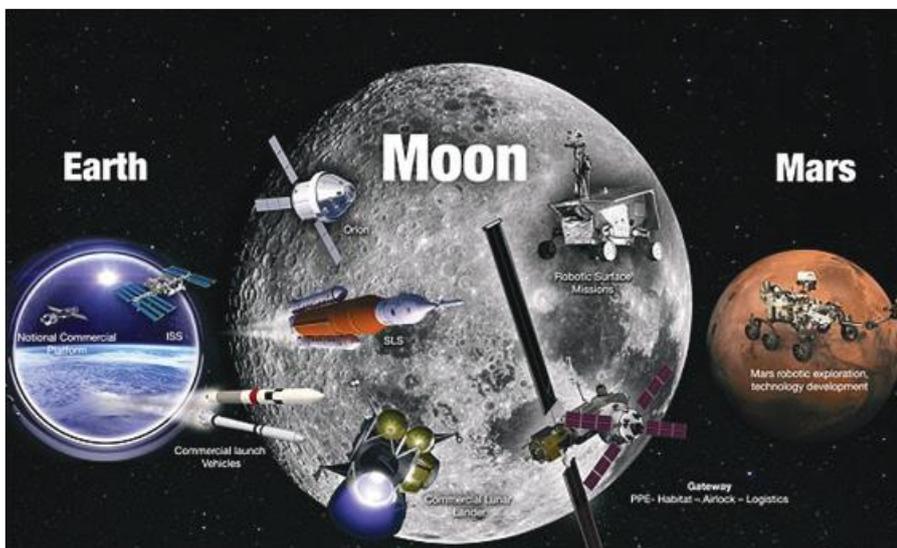
The most worrying outcome of glacial recession is the increase in the formation and size of glacial lakes. They are formed when a glacier erodes the land, and then melts within the hole it has created. This in turn could lead to glacial lake outburst floods (GLOF) when there is an avalanche or an earthquake. Satellite data shows that the number of such lakes in the Hindu Kush-Himalayan region grew to 4,260 in a decade from 3,350 in 1990.

2. NASA unveils roadmap for putting astronauts on Moon in 2028

NASA plans to put American astronauts back on the Moon by 2028, with unmanned demonstration missions in 2024 and 2026.

Bridenstine laid out the space agency’s plan to support the development of commercial hardware capable of landing astronauts on the Moon.

The mission architecture represents a dramatic shift from the way NASA had put humans on the Moon when Apollo 11 in July 1969 put Neil Armstrong as the first man to walk on the lunar surface.



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The procurement plan, as laid out in a document known as a Broad Agency Announcement, calls for commercial ventures to propose concepts for a descent module, a space refuelling system and a transfer vehicle by March 25. NASA would select several companies for an initial six-month phase to study and develop in this line and will allocate up to \$9 million to each company.

Based on the progress made during the first phase, two companies would be chosen to build hardware for a series of demonstration missions.

The hardware would then be launched aboard commercial rockets and NASA's yet-to-be-built Space Launch System to the Gateway space platform, which the U.S. space agency and its international partners plan to build in lunar orbit during the early 2020s.

The first demonstration mission, scheduled for 2024, would involve sending down an unmanned descent module from the Gateway to the lunar surface. The second mission, set for 2026, would be again another unmanned demonstration of the descent module, plus an ascent module to get back from the Moon to the Gateway.

Astronauts would make their first trip to the lunar surface in 2028. NASA's plan calls for four astronauts to spend as long as seven days on the Moon.

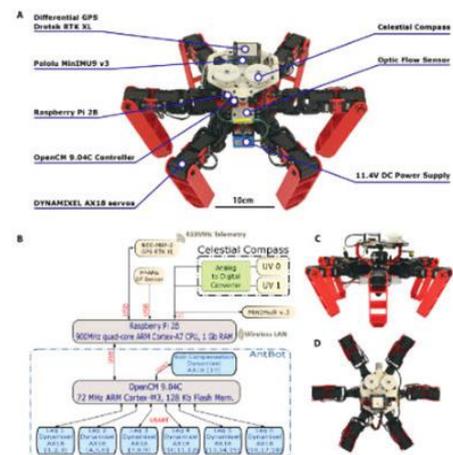
3. This robot can navigate without GPS

The first walking robot that can explore its environment and find its way home without GPS or mapping, opening new avenues for the navigation of autonomous vehicles.

Researchers from the French National Center for Scientific Research (CNRS) took inspiration from desert ants, which are extraordinary solitary navigators, to design the AntBot.

It is equipped with an optical compass used to determine its heading by means of polarised light, and by an optical movement sensor directed to the Sun to measure the distance covered.

Armed with this information, AntBot has been shown to be able, like the desert ants, to explore its environment and to return on its own to its base, with precision of up to one centimetre after having covered a total distance of 14 metres.



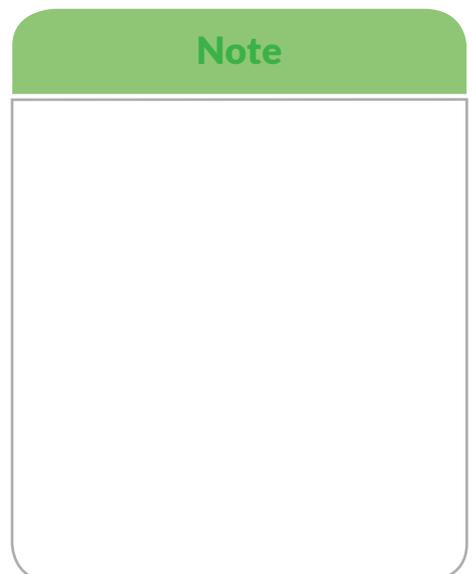
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4. New NASA telescope to explore origins of universe

NASA will launch a new space telescope in 2023 that could provide a glimpse of the first moments in the history of the universe, and explore how common are the ingredients for life in our galaxy's planetary systems.

The Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer (SPHEREx) mission is a planned two-year mission funded at USD 242 million.

SPHEREx will survey the sky in optical as well as near-infrared light which, though not visible to the human eye, serves as a powerful tool for answering cosmic questions.



Astronomers will use the mission to gather data on more than 300 million galaxies, as well as more than 100 million stars in our own Milky Way, NASA said.

SPHEREx will survey hundreds of millions of galaxies near and far, some so distant their light has taken 10 billion years to reach Earth.

In the Milky Way, the mission will search for water and organic molecules in stellar nurseries, regions where stars are born from gas and dust, as well as disks around stars where new planets could be forming.



5. The Cholas of Polonnaruwa

The Golden Triangle of Sri Lankan Tourism for years has been **Anuradhapura, Polonnaruwa and Sigiriya**. But hordes of visitors to the Island visit here little realising the deep connections the area has with the Cholas of Thanjavur.

The Historical Connections

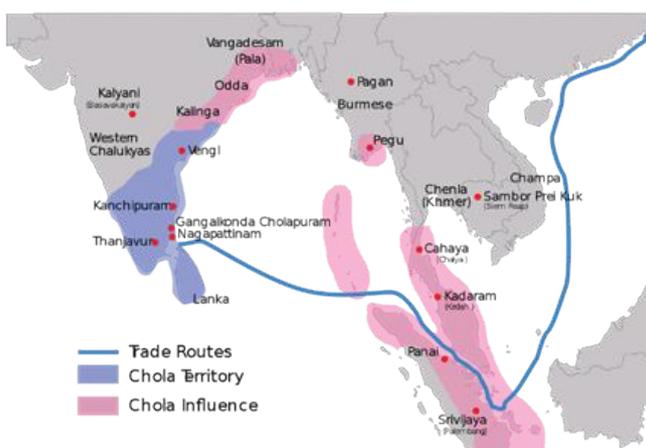
RajarajaChola I (985-1016 AD), ambitious to spread Chola influence overseas, conquered the whole of the northern, north-central and north-western parts of Ceylon in 993 AD and left the Island the legacy of Eelam disputed to this day. Here, Anuradhapura had been the capital of Ceylon for over a thousand years, but RajarajaChola decided to shift it to Polonnaruwa, possibly because it was closer to the port of Trincomalee and because the giant river neighbouring it, the Manaweli Ganga, made access to the central sub-kingdoms easier.

Seventy-plus years of Chola occupation ended when a revolt in the Chola Kingdom in India necessitated the withdrawal of the bulk of the Chola forces to counter the insurrection. Vijayabahu (I), the ruler of a southern kingdom in Ceylon, raised an army and took over Polonnaruwa. Here he and his successors, between 1153 and 1196 AD built the palaces,

the Buddhists shrines (viharas) and the great meeting halls that tourists flock to see in this day. Most of these have been built by Chola lasthaphathis, but they also built much that was pure Chola Hindu shrines because of the circumstances of the times.

The Chola period saw several Hindu devales (shrines)

built and more were built by the Sinhala successors, many of whom had brides from South India. There was also a large population of Hindu mercenary soldiers, merchants, traders and artisans, their descendants now the claimants for Eelam. These are heritage sites paid little attention to by guides and tourists.



Note



When Polonnaruwa was abandoned as a capital in the 13th Century – for Dambadeniya – the jungle tide was allowed to take over. What the British discovered in the 19th Century was the granite pillars and paving, much of it from South India, and very little of the considerable brickwork that had been vandalised. Restoration began around the beginning of the 20th Century leading to Polonnaruwa becoming a World Heritage site.

Restored to an extent now are eight Siva devales, five Vishnu devales, a Kali temple and a temple to Lord Ganesha. Keeping track of them has been ThiruArumugam, a former Ceylon Police Officer now settled in Sydney, and a chronicler of Ceylon History. His footnote to this history is the Chola bronzes found during excavation for restoration.

6. Fall army worm hits maize seed production

Telangana State Seed and Organic Certification Authority (TSSOCA) has stated that fall army worm attack on maize crop has impacted the seed production under the OECD programme.

TSSOCA, which is nodal certifying agency for seed production under OECD, has suggested the farmers producing maize seed under OECD programme both in Telangana and Andhra Pradesh to sow the seed crop only in November-December period to reduce the intensity of fall army worm attack on the crop.

The fall armyworm (*Spodopterafrugiperda*)

1. The fall armyworm (*Spodopterafrugiperda*), a native of the Americas, first seen in Asia five months ago.
2. Since its identification in the State's Shivamogga district in May, the pest has reached as far as West Bengal and Gujarat.
3. There are six phases in the fall armyworm's life, and between the first and the last, its appetite changes dramatically.
4. Within days, it turns from a light feeder into a voracious eater that can wipe out farms. After pupation, adult moths emerge.



Other alien attacks on farm fields

1. This isn't the first time a foreign visitor is poised to wreak havoc on Indian farms.
2. In 2008, the papaya mealybug, a central American native, entered the country and destroyed plantations in several States.
3. Then, in 2014, the tomato pinworm, or *Tutaabsoluta*, a South American moth, was spotted in Karnataka. Within a couple of years, it had reached Maharashtra, Gujarat, Delhi and other regions, where it caused widespread damage to tomato crop.

The rise in invasives

1. Some researchers have argued that India has traditionally been extra vulnerable to invasive species because of its history of political invasions.
2. From the Mughals to the British and the Portuguese, everyone brought their share of noxious weeds, insects and trees.
3. Consider the case of the Lantana species, *camara*, which was first

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introduced by the British as an ornamental hedge in the 19th century.

4. Today, it is widespread across India and threatens biodiversity by taking over forest understorey and grabbing resources from other species.
5. Another invasive, congress grass, is thought to have piggybacked via wheat shipments from the U.S. under the 1950s PL-480 Food for Peace program.
6. But the entry of invasives has been rising the world over in the last few decades, and one likely reason is increased trade.
7. Out of several factors such as a country's population density and amount of cropland, it was the degree of international trade that best predicted the number of invasives.



Note

