

GEOGRAPHY/SCIENCE

➤ **Salt flats around the world are covered in a similar pattern of ridges. Why?**

➤ **CONTEXT:** In a new study, researchers from Austria, Germany, and the U.K. may finally have an explanation as to why the salt on the surface forms ridges that join together in a patchwork of pentagons and hexagons. It is important to know the underlying mechanism because salt flats have significant effects on both humans and the climate.

- In salt flats across the world, the salt on the surface forms ridges that join together in a patchwork of pentagons and hexagons.

- These captivating patterns have been photographed as far apart as Bolivia, Chile, China, India (in the Rann of Kutch), Iran, Tunisia, and the U.S. These shapes are also invariably a metre or two across. That the salt always crenellates in these shapes and at these sizes, irrespective of the local environmental conditions, the mineral chemistry, the soil type, and other factors has puzzled researchers.



A view of the Salar de Uyuni in Bolivia, November 2004

➤ **What are salt flats?**

- A salt flat is a natural landscape in which a large area of flat land is covered by salt. Perhaps the world's most well-known salt flat is the Salar de Uyuni in Bolivia. It is the largest in the world of its kind, and also contains more than half of the planet's lithium reserves.

- A salt flat forms from a natural water body whose recharge rate is lower than the evaporation rate. Over time, all the water evaporates, leaving behind the dissolved minerals, usually salts. They reflect sunlight strongly and thus appear bright. The underlying soil is highly saline: even if the water table is shallow, the groundwater is too salty for humans to drink.

➤ **How do the shapes form?**

- The researchers began with the hypothesis that the salt on the surface is influenced by the salt flowing through the soil below.

- ✓ Imagine the soil in a salt flat: there are some ridges on the top, followed by a layer of salt, then the topmost layer of the soil, and finally the rest of the soil. The groundwater in the soil is saline but the distribution of salt is not uniform. The salinity is highest near the top of the soil and decreases towards the bottom.

- ✓ The researchers found that the salt penetrated deeper into the soil exactly below the ridges, and remained shallow under the flat areas. That is, if we removed the topmost layer and looked directly down at the soil, it would see that the salty groundwater is flowing deeper into the soil along vertical sheets, not throughout.

➤ **What explains this finding?**

- The surface of a salt flat has a layer of salt that has been deposited over time. So just under the surface, the groundwater is highly saline and denser than the groundwater further below.

- If any water reaches and rises above the surface, it evaporates to leave more salt behind. The researchers found that if the rate of evaporation is sufficiently high, i.e. if the rate of salt deposition on the surface is sufficiently high, the denser groundwater will sink down and the less-saline, less-dense groundwater will rise to the top. This body of descending and ascending water is called a convection cell.

- Over time, there will be more saline groundwater rising up towards the surface through the convection cells than through other parts of the soil – simply because the less-dense water within the column is being displaced upwards. As a result, the salt this water carries will accumulate on the surface, forming the narrow ridges that make up the polygons.

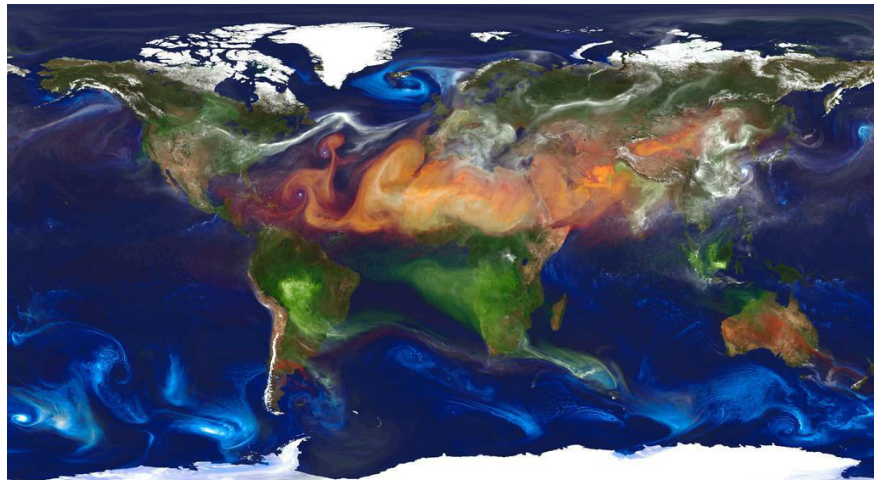
- The mathematical equations the researchers assembled for their computer model indicated that the “subsurface convection is relatively insensitive to salt chemistry”, as they wrote in their paper, the convection columns naturally grew to have a stable width of 1-2 m – just like the dimensions of the polygons on the surface.

➤ **Why do the results matter?**

- The early 1960s, scientists have offered different explanations for why the surface of dried salt lakes becomes covered with this pattern of polygonal shapes. Most of them have either considered above-the-surface dynamics or below-the-surface dynamics, whereas the new study shows that the polygons are formed when these two realms interact.

- The theory and the results matter because when winds blow over salt flats, they carry some of the salt with them as particulate matter. When this air mass reaches the ocean, it deposits the salts there. Such sea salt can enter the atmosphere and go on to swirl at the centre of cyclones. When a salt-bearing air mass reaches an inhabited area, the particles cause significant respiratory problems. A 1996 study characterised the salt flat of what was once Owens Lake in California the “single greatest source of particulate matter in North America”.
- To mitigate the deleterious effects of salt flats, experts have recommended covering them in a shallow layer of water, so that the salt is deposited on the surface more uniformly and less salt is carried away by winds.

- Salt suspensions are also an important group of aerosols (suspensions of fine solids in air) that reflect sunlight. We have also known for some time that saline lakes around the world are shrinking, including due to agriculture. So more accurate climate models will need to better understand the sources of salt, and the new findings describe one such source.



- **This Image based on data shows dust (red), sea salt (blue), smoke (green), and sulphate particles (white) in the air around the world.**

POLITY

- **How are the CEC and ECs appointed, and what has the Supreme Court order changed?**
- **CONTEXT:** A five-judge Constitution Bench of the Supreme Court recently unanimously ruled that a high-power committee consisting of the Prime Minister, Leader of Opposition in Lok Sabha and the Chief Justice of India must pick the Chief Election Commissioner (CEC) and Election Commissioners (ECs).
 - This is a very significant judgment that seeks to change the way in which India’s top election officials are appointed, and can potentially have far-reaching implications. As of now, the central government essentially has a free hand in appointing these officials.
 - The Bench headed by Justice K M Joseph ruled on a batch of petitions seeking a selection process similar to what is followed in the case of the Director, Central Bureau of Investigation (CBI). The Bench also comprised Justices Ajay Rastogi, Aniruddha Bose, Hrishikesh Roy and C T Ravikumar.
- **What was the plea before the Supreme Court?**
 - The public interest petitions sought a law governing the appointment of the CEC and ECs. A first PIL had been filed in 2015, and the Supreme Court agreed to hear a second PIL on the issue filed in 2018 by Delhi BJP leader Ashwini Upadhyaya, and referred the matters to a Constitution Bench.
 - The court heard the case in November 2022. On the last day of the hearing, the court had noted that the appointment of Arun Goel as EC had been carried out with “lightning speed”, with the procedure taking less than 24 hours on November 18 from start to finish.
 - Justice Rastogi authored a separate opinion agreeing with the majority opinion authored by Justice Joseph. The fine print of the ruling is awaited.
- **How are the CEC and ECs currently appointed?**
 - There are just five Articles (324-329) in Part XV (Elections) of the Constitution. Article 324 of the Constitution vests the “superintendence, direction and control of elections” in an Election Commission consisting “of the Chief Election Commissioner and such number of other Election Commissioners, if any, as the President may from time to time fix”.
 - The Constitution does not lay down a specific legislative process for the appointment of the CEC and ECs. The President makes the appointment on the advice of the Union Council of Ministers headed by the Prime Minister.
- **What are the powers of the Election Commission?**
 - The Constitution of India gave the Election Commission sweeping powers without going into the specifics. Introducing this provision in the Constituent Assembly on June 15, 1949, Babasaheb Ambedkar had said “the whole election machinery should be in the hands of a Central Election Commission, which alone would be entitled to issue directives to returning officers, polling officers and others”.
 - Parliament subsequently enacted The Representation of the People Act, 1950, and The Representation of the People Act, 1951, to define and enlarge the powers of the Commission.

- The Supreme Court in ‘Mohinder Singh Gill & Anr vs The Chief Election Commissioner, New Delhi and Ors’ (1977) held that Article 324 “operates in areas left unoccupied by legislation and the words ‘superintendence, direction and control’ as well as ‘conduct of all elections’ are the broadest terms”. The Constitution has not defined these terms.
- The SC said Article 324 “is a plenary provision vesting the whole responsibility for national and State elections” in the ECI “and, therefore, the necessary powers to discharge that function”.
- The Election Commission (Conditions of Service of Election Commissioners and Transaction of Business) Act, 1991 (EC Act) requires that the EC and CEC must hold the post for a period of six years. This law essentially governs the conditions of service of the CEC and ECs.
- **Was the Election Commission always a three-member body?**
- For almost four decades of the republic, until 1989, the Election Commission was a single-member body, with only a Chief Election Commissioner (CEC). The Election Commission was expanded just ahead of the elections to the ninth Lok Sabha in an atmosphere of friction between the Rajiv Gandhi government and then CEC R V S Peri Sastri.
- These differences had resulted in some uncomfortable moments for the government during the Presidential election of 1987, and Rajiv’s government, apprehensive of what Peri Sastri might do during the Lok Sabha elections of 1989, decided to curtail his powers by making the Election Commission a multi-member body. So on October 7, 1989, President R Venkataraman, in the exercise of his powers under Article 324(2), issued a notification creating two positions in the Election Commission in addition to that of the CEC. On October 16, 1989, the government appointed S S Dhanoa and V S Seigell to these posts.
- But this arrangement did not last. The Congress lost power in the elections, and the National Front government of Prime Minister V P Singh quickly rescinded the presidential notification of October 7, 1989. EC Dhanoa challenged his removal in the Supreme Court, but his petition was dismissed.
- The V P Singh government then enacted the Election Commission (Conditions of Service of Election Commissioners and Transaction of Business) Act, 1991 (EC Act), which gave the CEC a status equal to that of a Supreme Court judge, and his retirement age was fixed at 65 years. The ECs were given the status of High Court judges, and their retirement age was fixed at 62 years. The passage of the EC Act essentially meant that if and when the Election Commission became a multi-member body again, the CEC would act as its chairman, and the ECs would be junior to him.
- **So when did the Election Commission again become a three-member body?**
- On December 12, 1990, T N Seshan was appointed CEC. Seshan was fiercely independent, and as he went about the Commission’s job with messianic zeal, the Congress government headed by P V Narasimha Rao decided to expand the poll body again on October 1, 1993. M S Gill and G V G Krishnamurthy were appointed as ECs. Also, the government brought an Ordinance to amend the EC Act, and made the CEC and the ECs equal by giving all three the status of a Supreme Court judge, retiring at the age of 65 years.
- In other words, all three Commissioners now had equal decision-making powers. The amendment also introduced sections that envisaged that the CEC and the ECs would act unanimously and, in case there was a difference of opinion on any issue, the majority view would prevail.
- Seshan moved the Supreme Court, alleging that the three provisions were an attempt by the government to curtail his powers. A five-judge Bench headed by Chief Justice of India A M Ahmadi dismissed the petition (T N Seshan Chief Election Commissioner vs Union Of India & Ors, July 14, 1995), and the ECI has functioned as a three-member body ever since.

PRELIMS

1. World Wildlife Day 2023

- **CONTEXT: March 3 is known as World Wildlife Day (WWD), marked annually to draw attention to issues of conservation of flora and fauna.**
- This year, the theme is ‘Partnerships for Wildlife Conservation’
- It is further expanded into the conservation of marine life and oceans, and on collaborating with businesses and funding conservation activities. “Successful partnerships for conservation must find ways of including business if we are to reverse the loss in biodiversity.”
- **Why is World Wildlife Day marked?**
- In 2013, the United Nations General Assembly (UNGA) proclaimed March 3 as the UN World Wildlife Day to celebrate and raise awareness of protecting the world’s wild animals and plants.
- This was as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed in 1973 on this day.
- March 3 marks the 50th anniversary of CITES’ establishment. CITES is considered a landmark agreement on conservation that focuses on ensuring the sustainability of endangered species.
- **What is the CITES?**
- CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species.

- It was agreed upon with the recognition that “The trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation.” It accords varying degrees of protection to more than 37,000 species of animals and plants, ranging from live animals and plants to wildlife products derived from them, including food products, exotic leather goods, medicines, etc.
- Currently, there are 184 parties to the convention, including India. The CITES Secretariat is administered by UNEP (The United Nations Environment Programme) and is located in Geneva, Switzerland. The Conference of the Parties to CITES is the supreme consensus-based decision-making body of the Convention and comprises all its parties.
- In India, apart from the Union Ministry of Environment, Forests and Climate Change, the Wildlife Crime Control Bureau is a statutory body under the Ministry that is especially meant to combat organised wildlife crime in the country. It assists and advises the customs authorities in the inspection of the consignments of flora and fauna as per the provisions of the Wild Life Protection Act of 1972, CITES and the export and import policy governing items.

➤ **How does CITES work?**

- The species covered under CITES are listed in three Appendices, according to the degree of protection they need.
 - ✓ Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted rarely, only in “exceptional circumstances”, such as gorillas, and lions from India.
 - ✓ Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled to ensure their survival. For example, certain kinds of foxes and Hippopotamuses.
 - ✓ Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade, like the Bengal fox or the Golden Jackal from India. Different procedures are given category-wise to engage in the trade of species in each of the lists.

2. Erythritol

➤ **CONTEXT: A new research by Cleveland Clinic, published in Nature Medicine, has shown that Erythritol, a popular artificial sweetener, is associated with an increased risk of heart attack and stroke.**

- Erythritol is a type of sugar alcohol that is commonly used as a sugar substitute in foods and beverages.
- Unlike traditional sugars, it has no calories and does not raise blood sugar levels.
- It is also believed to have a lower glycemic index than other sweeteners, meaning it may not have as strong an impact on insulin levels.
- Erythritol is 60–70% as sweet as sucrose (table sugar).
- Japanese companies pioneered the commercial development of erythritol as a sweetener in the 1990s.
- Erythritol occurs naturally in some fruit and fermented foods.
- It also occurs in human body fluids such as eye lens tissue, serum, plasma, fetal fluid, and urine.
- At the industrial level, it is produced from glucose by fermentation with a yeast, *Moniliella pollinis*.

➤ **Uses**

- Beverage categories for its use are coffee and tea, liquid dietary supplements, juice blends, soft drinks, and flavored water product variations, with foods including confections, biscuits and cookies, tabletop sweeteners, and sugar-free chewing gum.

➤ **Research Findings**

- Researchers studied over 4,000 people in the US and Europe and found that those with higher blood Erythritol levels were at elevated risk of experiencing a major adverse cardiac event such as heart attack, stroke or death.
- They also examined the effects of adding Erythritol to either whole blood or isolated platelets, which are cell fragments that clump together to stop bleeding and contribute to blood clots. Results revealed that erythritol made platelets easier to get activated and form a clot. Pre-clinical studies confirmed ingestion of erythritol heightened clot formation.

3. National Youth Parliament Festival

➤ **CONTEXT: The Speaker of Lok Sabha addressed the inaugural session of the National Youth Parliament Festival.**

- The Speaker of Lok Sabha addressed the 4th edition of the National Youth Parliament Festival (NYPF) on 2nd march 2023 in the Central Hall of Parliament, New Delhi.

➤ **About**

- The National Youth Parliament Festival is organized to hear the voice of the youth.
- It is based on the idea given by the Prime Minister in his Mann Ki Baat Address in 2017.
- Taking inspiration from the idea, the 1st edition of NYPF was organized in 2019 with the theme “Be the Voice of New India and Find solutions and Contribute to Policy ”.
- 2nd edition of NYPF was organized with the theme “YUVAAH - Utsah Naye Bharat Ka” through virtual mode which was witnessed by more than 23 lakh youth and stakeholders across the country at District, State and National levels.
- 3rd edition of NYPF was organized with the theme ‘be the voice of New India and find solutions and contribute to Policy’.

- The theme of the 2023 National Youth Parliament Festival is “Ideas for a Better Tomorrow: India for the World”.
- **Objectives**
- To hear the voice of youth between 18-25 years of age, through deliberations in Youth Parliaments at District, State and National levels.
- To encourage the youth to engage with public issues, understand the common man's point of view, form their opinions and express it articulately.
- To develop and enhance decision-making abilities.
- To develop in them respect and tolerance for the views of others.
- To develop in them an understanding that respect for rules is essential for conducting any discussion systematically and effectively.
- To obtain and document their opinions on the Vision of New India.
- To make available their views to policymakers and implementers to take it forward.
- **Conducted at three levels:**
- District Youth Parliament (DYP) will be conducted through virtual mode at the District level.
- State Youth Parliament (SYP) will be conducted in virtual mode. The youth selected from the District Youth Parliament will participate at the State level in SYP.
- National Youth Parliament (NYP): The youth selected from the State Youth Parliament will participate at the National level in NYP in New Delhi.
- The winners of earlier National Youth Parliament Festivals at the National level may not be eligible to take part in the 4th edition of National Youth Parliament Festivals -2023.

ANSWER WRITTING

Q. Social Stock Exchange (SSE) can help in combining the social welfare with capital markets. What is a social stock exchange? What are the various criteria's that makes an organisation eligible for getting listed on a SSE.

The social stock exchange (SSE) is a novel concept in India and was first floated during the budget session of 2019-2020. The social stock exchange will help social enterprises raise public funds via the stock exchange mechanism. It will enable fund providers to filter entities or non-profit organisations that are creating a noticeable social impact. A stock exchange of this kind is intended to benefit the private and non-profit sectors by directing more capital to them.

Eligibility criteria for listing on a Social Stock Exchange (SSE) as per SEBI:

- **Primacy of Social Intent:** Any non-profit organisation (NPO) or for-profit social enterprise (FPSE) which establishes the primacy of social intent would be recognised as a social enterprise (SE). This will make it eligible to be listed or registered on the SSE.
- **Minimum requirements:** To meet the minimum requirements NPO needs to be **registered as a charitable trust** and should be **registered for at least three years**. It must have spent at least ₹50 lakhs annually in the past financial year and should have received funding of at least ₹10 lakh in the past financial year.
- **Organisations must engage in social activities:** SEBI has identified certain broad social activities based on the Companies Act, 2013, Sustainable Development Goals (SDGs) and priority areas identified by NITI Aayog in which the organisations must engage-
 - ✓ Eradicating hunger, poverty, malnutrition and inequality.
 - ✓ Promoting healthcare, supporting education, employability and livelihoods.
 - ✓ Gender equality, empowerment of women and LGBTQIA communities.
 - ✓ Working towards environmental sustainability; protection of national heritage and art or bridging the digital divide.
 - ✓ Supporting incubators of social enterprise.
- **Enterprises must aim to redress regional imbalances:** The eligible activities of the social enterprises shall **target underserved or less privileged population segments** or regions that recorded lower performance in the development priorities of National/state governments.
- **Two-thirds of activities shall fall under the social category:** Social Enterprises must have at least 67% of their activities qualifying as eligible activities for the target population towards attaining the stated objectives.
- **Conducting Social Audit:** SEBI's regulations also state that a social enterprise should submit an annual impact report in a prescribed format. The report must be audited by a social audit firm.
- **Entities not eligible for registering on SSE:** Further, certain entities such as corporate foundations, political or religious organizations/ activities, professional or trade associations, and infrastructure and housing companies will not be permitted on SSE.

Therefore, Social Stock Exchange holds the potential for more **inclusive economic and social growth**. These stock exchanges are anticipated to bridge the funding gap for such social enterprises thereby creating the necessary social investment ecosystem. This would also maximize the positive social impact and place the **environmental, social and governance (ESG)** features within the pursuit of profits and growth.

MCQs

1. Salar de Uyuni salt flat often mentioned in news is situated in which of the following country?
a) Peru b) Chile c) **Bolivia** d) Paraguay

2. Consider the following statements:
 1. The Election Commission of India is a five-member body.
 2. Union Ministry of Home Affairs decides the election schedule for the conduct of both general elections and bye-elections.
 3. Election Commission resolves the disputes relating to splits/mergers of recognised political parties.
 Which of the statements given above is/are correct?
 a) 1 and 2 only b) 2 only c) 2 and 3 only **d) 3 only**
3. With reference to World Wildlife Day (WWD) consider the following statements
 1. This day is significant, as on this occasion, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed on 3 March 2013.
 2. The theme for the year 2023 is “Recovering key species for ecosystem restoration”.
 3. In 2013, the IUCN proclaimed March 3 as the UN World Wildlife Day
 Which of the above statement/s is/are not correct?
 a) 1 and 2 only b) 2 and 3 only c) 1 and 3 only **d) 1,2 and 3**
4. With reference to the National Youth Parliament Festival - 2023, consider the following statements:
 1. The National Youth Parliament Festival is organised on 12th January on the occasion of the National Youth Day in order to encourage the youth in the age group of 18-35 years to engage with public issues and understand the common man’s point of view.
 2. National Youth Day is celebrated on 12 January being the birthday of Jawaharlal Nehru.
 Which of the statements given above is/are correct?
 a) 1 only b) 2 only c) Both 1 and 2 **d) Neither 1 nor 2**
5. Fortified ancient city of “Sisupalgarh” often mentioned in news is situated in which of the following state?
a) Odisha b) Andhra Pradesh c) Jharkhand d) Bihar
6. With reference to Sashastra Seema Bal (SSB) consider the following statements
 1. It is part of Central Armed Police Forces (CAPF) under Ministry of Home Affairs
 2. The sole objective of achieving total security preparedness for performing counter terrorism activity.
 Which of the above statement/s is/are not correct?
a) 1 only
 b) 2 only
 c) Both 1 and 2
 d) Neither 1 nor 2
7. Easter Island has been in news because of archaeologists have discovered Moai statue, the island is located in which of the following Ocean or sea?
a) North Pacific ocean
b) South Pacific ocean
 c) Mediterranean sea
 d) North Atlantic ocean
8. With reference to SWAYATT initiative often mentioned in news, consider the following?
 1. It is an initiative to promote start-ups, women and youth advantage through e-Transactions on government e Marketplace (GeM).
 2. It was launched in 2019 under the Ministry of Commerce and Industry.
 Which of the above statement/s is/are correct?
 a) 1 only
 b) 2 only
c) Both 1 and 2
 d) Neither 1 nor 2
9. VAIBHAV Fellowship scheme recently launched for which of the following?
a) Indian Diaspora abroad
 b) Tribal students
 c) Nabodaya students
 d) IIT entrance students
10. ‘Erythritol’ a substance seen in news is mostly used as:
 a) Antibiotic
 b) Food preservative
c) Artificial sweetener
 d) Colouring agent