Prelim Bits 31-05-2022 | UPSC Daily Current Affairs

Unicorn

India has reached a landmark figure of 100 unicorn startups with a valuation of more than $300 billion.

- The term "Unicorn" was coined by American venture capitalist **Aileen Lee** in 2013.
- The Unicorns are **privately held**, **venture-capital backed startups** that have reached a value of **$1 billion**.
- The valuation of unicorns is not expressly linked to their current financial performance.
- But the valuation is largely based on their growth potential as perceived by investors and venture capitalists who have taken part in various funding rounds.
- It was used to emphasise the rarity of the emergence of such startups.

Reference

1. https://timesofindia.indiatimes.com/india/number-of-unicorns-in-india-have-reached-100-mark-says-pm-modi-in-89th-edition-of-mann-ki-baat/articleshow/91866783.cms
2. https://indianexpress.com/article/explained/everyday-explainers/explained-what-is-a-unicorn-and-what-does-it-take-to-become-one-7944468/

Community Forest Rights

Chhattisgarh has become the second state in the country to recognise Community Forest Resource (CFR) rights of a village inside a national park.

- **CFR Area** is the common forest land that has been traditionally protected and conserved for sustainable use by a particular community.
- The community uses it to access resources available within the traditional and customary boundary of the village; and for seasonal use of landscape in case of pastoralist communities.
- Each CFR area has a customary boundary with identifiable landmarks recognised by the community and its neighboring villages.
- It may include forest of any category - revenue forest, classified & unclassified forest, deemed forest, DLC land, reserve forest, protected forest, sanctuary and national parks etc.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act or the Forest Rights Act (FRA) recognises two broad types of rights to forestland with forest-dwelling communities:

- Individual forest rights (IFR) and

    - Community forest rights (CFR).

- **CFR rights** under the Section 3(1)(i) of FRA provide for recognition of the right to protect, regenerate or conserve or manage the CFR.
- These rights allow the community to formulate rules for forest use by itself and others and thereby discharge its responsibilities under Section 5 of the FRA.
- CFR rights, along with Community Rights (CRs), which include nistar rights and rights over non-timber forest products, ensure sustainable livelihoods of the community.
- These rights give the authority to the Gram Sabha to adopt local traditional practices of forest conservation and management within the community forest resource boundary.
- **Significance -** The FRA recognises the community's right to use, manage and conserve forest resources, and to legally hold forest land that these communities have used for cultivation and residence.
- It also underlines the integral role that forest dwellers play in sustainability of forests and in conservation of biodiversity.
- It is of greater significance inside protected forests like national parks, sanctuaries and tiger reserves as traditional dwellers then become a part of management of the protected forests using their traditional wisdom.
- **Challenge** - While CFR rights are an important empowerment tool, getting a consensus amongst various villages about their traditional boundaries often proves a challenge.

Reference

1. https://indianexpress.com/article/explained/explained-what-are-community-forest-rights-why-do-they-matter-7939921/
2. https://www.epw.in/journal/2020/18/special-articles/implementation-community-forest-rights.html

System of Rice Intensification

Experts said that the 'System of Rice Intensification' method is beneficial for the soil, environment and farmers.

- System of Rice Intensification (SRI) was first developed in **Madagascar** in the 1980s.
- It involves cultivating rice with as much organic manure as possible, starting with
    - Young seedlings planted singly at wider spacing in a square pattern; and
    - Intermittent irrigation that keeps the soil moist but not inundated, and
    - Frequent inter cultivation with weeder that actively aerates the soil.
- It is a water and environment saving technique. It promises to **save 15 to 20% ground water**, and improves rice **productivity**.
- It gives equal or more produce than the conventional rice cultivation, with less water, less seed and less chemicals.
- The net effect is a substantial reduction in the investments on external inputs.
- **Working -** First, the field is prepared by **ploughing**.
- It should be laser levelled before transplanting for proper water management and efficiency for a good crop stand.
- Then **irrigation** is applied in the field which is not a flooding of field like traditional methods but less than that of a well irrigated field.
- Then 10-12 days old paddy plants along with soil particles around the root with minimum disturbance to the roots are transplanted in lines, which are marked at a distance of 10 inches from each other.

- The purpose of making lines is to provide a favourable environment for growth and development of rice plants through such spacing.

  Unlike Direct Seeding of Rice (DSR) technique, which is suitable only for mid to heavy textured soils, SRI is suitable in all types of soil including less fertile soil as in such soil the number of seedlings can be increased to double.

- **Comparison** - Under SRI, 2kg seed is required to grow a nursery for one acre against 5kg seed required in the traditional method.
- In sowing from the day of transplanting till the crop turns 35-40 days fields are kept under.
- And then fields are filled every week till a few weeks before harvesting.
- Unlike the traditional method, which requires continuous flooding, the SRI only needs intermittent irrigation.
- Irrigation is given to maintain soil moisture near saturation initially, and water is added to the field when the surface soil develops hairline cracks.
- **Weeds control -** In DSR, when the weeds are major problem and weedicides are sprayed simultaneously at the time of sowing.
- In SRI, which permits greater weed growth because of alternate wetting and drying of fields, the weeds are incorporated into the soil by operating a cono-weeder between rows, which are made at the time of sowing.
- This adds nutrients to the crop like green manures.

Reference

1. https://indianexpress.com/article/explained/punjab-paddy-sowing-technique-water-labour-costs-7938766/
2. https://vikaspedia.in/agriculture/best-practices/sustainable-agriculture/crop-management/sri-2013-new-method-of-growing-rice#:~:text=The%20System%20of%20Rice%20Intensification,cultivation%20with%20weeder%20that%20actively

Microbial Defluorination of PFAS

Engineers report the microbial defluorination of a Per- and polyfluoroalkyl substances (PFAS) structure called fluorinated carboxylic acids (FCAs) by replacing carbon-fluorine bonds with carbon-hydrogen bonds.

- Under **anaerobic** conditions, a carbon-carbon double bond is crucial for the shattering the ultra-strong carbon-fluorine bond by microbial communities.
- While breaking the carbon-carbon bond does not completely degrade the molecule, the resulting products could be relayed to other microorganisms for defluorination under in **aerobic** conditions.
- PFAS are a group of over 9,000 chemicals used in countless industrial processes and commercial products since the 1940s.
- As a result, PFAS have found their way into the water cycle and are now found in virtually every water source.
- These chemicals contain a bond between fluorine and carbon atoms that is the strongest single bond known, rendering PFAS non-biodegradable and resistant to conventional water treatment methods.
- They wind up in the tissues of organisms, including humans, where they have been associated

with some types of cancer, thyroid and liver problems, and likely other, still poorly understood, health problems.
- The point of entry for the anaerobic microbes was a **double bond** between the carbon atoms located next to the carboxyl group of the FCA molecules.
- Trifluoromethyl branches on the double bond could further enhance the biodegradability.
- Microbes capable of doing this type of defluorination are not rare.

Activated sludges are microbial communities commonly used in wastewater treatment facilities to break down and remove organic matter

- Using the activated sludge and an anaerobic condition, the bond can be broken off.
- This study further implies that simply through the cooperation among different microbial groups - anaerobic and aerobic bacteria - deeper defluorination could be achieved for certain perfluorinated chemicals.

Reference

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River Kosi

Rivers lining tropical and desert regions are more likely to change directions, according to a new study. This is seen especially in the case of Kosi River.

- Kosi River is a transboundary river in Nepal and northern India.
- With its tributaries, the Kosi drains the eastern third of Nepal and part of Tibet, including the country around Mount Everest.
- Some of its headstreams rise beyond the Nepalese border in Tibet.
- About 48 km north of the Indian-Nepalese frontier, the Kosi is joined by several major tributaries and breaks southward through the Siwālik Hills at the narrow Chatra Gorge.
- The river then emerges on the great plain of northern India in Bihār state on its way to the Ganges River, which it enters south of **Purnia**.
- Because of its great outflushing of debris, the Kosi has **no permanent channel** in its course through the great plain of northern India.
- It has long been notorious for its devastating floods, which long made vast tracts of northern Bihār unsafe for habitation or cultivation.
- Now a dam across the Chatra Gorge at Barakakshetra controls floods, permits irrigation of the floodplain, provides hydropower, and supports fish hatcheries.
- **Maize** is extensively cultivated on the sandy soils of the Kosi's basin.

Reference

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