Prelim Bits 27-12-2017

LiDAR to monitor Air Quality

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- Central Pollution Control Board (CPCB) is currently focussing on its surface-level monitoring of air quality of Delhi-NCR.
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- However, in "later stages", it is also planning to take up vertical monitoring by using advanced Light Detection and Ranging (LiDAR) devices.
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- LiDAR is a monitoring system for mapping and modelling in -micro-topography, forestry, agriculture, meteorology and environmental pollution-
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- LiDAR projects laser beams towards the sky.
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- Subsequently, the interplay of light with the objects falling on its path through absorption, reflection, scattering help determine the composition of suspended particulates.
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- Elastic Backscatter LiDAR and Raman LiDAR are used in monitoring air pollutants vertically.
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- The CPCB and IMD had used the Elastic Backscatter LiDAR during the 2010 Commonwealth Games and the data was utilised in 3D modelling and forecasting during the games.
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Memristors & AI

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- Artificial neural networks (ANNs) are computing systems that can learn and progressively improve performance on tasks by considering examples.

- Researchers have recently developed a new type of neural network chip that can dramatically improve the efficiency of teaching machines to think like humans.
- It improves a typical neural network's capacity and reduces the required training time.
- They have been created in the past with larger optical components.
- Now the researchers have created their system using memristors.
- Memristors are a special type of resistive device that can both perform logic and store data.
- This contrasts with typical computer systems, where processors perform logic separate from memory modules.
- Hence they require less space and can be integrated more easily into silicon-based electronics.

BND-4201

- Bharatiya Nirdeshak Dravya (BND-4201) is India's first home-grown high purity gold reference standard recently launched.

- It will be the reference material for gold of '9999' fineness i.e gold that is 99.99% pure.
- It will be beneficial to the consumers and public at large to ensure purity of gold.
- Once the BND's of other purity gold are made available in the market, jewellers will move towards more instrumental methods.

- The conventional fire assay methods for testing are not only time consuming but also not environment friendly as poisonous gases are released.
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- This will also be useful for Collection and Purity Testing Centres to certify the purity of gold deposits under the gold monetisation scheme.
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CAMPA Rules

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- Compensatory and Afforestation Fund (CAF) Bill envisaged the creation of a permanent Compensatory Afforestation Fund Management and Planning Authority (CAMPA).
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- The Bill establishes the National Compensatory Afforestation Fund and a State Compensatory Afforestation Fund under each State.
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- The Bill allows the States to access nearly Rs.42,000 crore, mostly collected from industrial projects as penalties, from CAMPA and channel it into afforestation projects.
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- More than a year after the Union government brought in the law, it is yet to frame rules to get the money disbursed.
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- While States are getting money, it continues to be under an "ad hoc" mechanism whereby the Centre disburses it on a needs-basis.
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- Also a year after the law came into being, the disbursal this year has dropped to a three-year low.
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$318 Million Loan Agreement

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- The Government of India, the Government of Tamil Nadu and the World Bank today signed a $318 million loan agreement for the **Tamil Nadu Irrigated Agriculture Modernization Project.**
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- The project is to promote climate resilient agriculture technologies, improve

water management practices, and increase market opportunities for small and marginal farmers.

- More than 160,000 ha of currently partially irrigated lands will come into full irrigation under this project.

- The project will rehabilitate and modernize about 4,800 irrigation tanks and 477 check dams, spread across 66 sub-basins, in delivering bulk water to irrigation systems.

- Paddy is the dominant crop occupying 34% of total cropped areas, whereas fruits and vegetables are grown on 11% and pulses and oilseeds on 14% of total cropped areas.

- By helping farmers' access modern technologies, linking them to markets, and providing postharvest management support, the project will enable farmers to shift from a mono crop paddy system to mixed cropping.

- The project will support smallholder producers adopt new conservation technologies such as the System of Rice Intensification (SRI) and Sustainable Sugar Initiative (SSI).

- They reduce average water usage by 35% and increase yields by 22% per ha.

- The loan has a 5-year grace period, and a maturity of 19 years.