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Embedded SIM

TRAI releases recommendations on 'Usage of Embedded SIM for Machine-to-Machine (M2M) Communications'.

Machine-to-Machine (M2M) Communications
• M2M is a broad label that can be used to describe any technology that enables networked devices to exchange information and perform actions without the manual assistance of humans. • Artificial intelligence (AI) and machine learning (ML) facilitate the communication between systems, allowing them to make their own autonomous choices. • M2M uses a device to capture an event, which is relayed through a network to an application that translates the captured event into meaningful information. • **Applications –** Smart home meters, vehicle telemetry services, asset tracking, wearable technologies, and automated supply chain management (SCM).

- These recommendations are aimed at streamlining the regulatory landscape of M2M embedded SIM (eSIM) in India.
- The Authority has laid emphasis on ensuring security by way of proper Know Your Customer (KYC), mitigating fraud risks and enhancing the overall integrity of the M2M eSIM ecosystem.
- The Authority has also recommended a framework for profile switching of eSIMs.
- This will provide significant flexibility to the M2M eSIM users and will promote healthy competition in the sector.

Subscriber Identity Module (SIM)

- A SIM (Subscriber Identity Module), also called a Universal Integrated Circuit Card or UICC, stores information that uniquely identifies a cellular subscription.
- SIM holds the credentials and security keys necessary to identify a subscriber.
- That identity comes in the form of a so-called IMSI number, or International Mobile Subscriber Identity, which is unique for every user or device on or off the network.

Embedded SIM	Electronic SIM (eSIM)

• An embedded SIM is a SIM card that cannot be removed from a device. • Traditional SIM cards are made so that they can easily be swapped out of a phone, so that core service information can get ported from one physical device to another. • With an embedded SIM, the chips are made to allow for information switching, so that the actual physical chip would not get removed from the device. • When using embedded SIM, customers would not need to order replacement SIM cards and physically integrate them into their phones. • The idea is that manufacturers would use the same SIM card across the industry. • However, embedded SIM cards include less customer freedom to adjust the device from one provider to another.	• eSIM is a hardware that runs an application called eUICC, which has storage to hold multiple SIM profiles at the same time (but only one can be active), and can be provisioned remotely, over the air (OTA). • eSIM is a SIM that can load new carrier profiles digitally, over the air, which means one no longer need to physically swap SIM cards in their devices. • The profiles stored on an eSIM can be modified remotely, through software and API calls, without needing to physically swap SIMs. • An eSIM can hold multiple SIM profiles at the same time, which can give a device access to multiple completely different carriers, however, only one SIM can be active at a time.

References

1. PIB – TRAI releases recommendations on usage of embedded SIM
2. Business Standard – Machine-to-Machine Communications
3. The Print – Usage of Embedded SIM

Antarctic Circumpolar Current (ACC)

Scientists reconstruct history of world's most powerful ocean current over last 5.3 million years and its link to global climate.

- Antarctica is surrounded by the Southern Ocean.
- **Southern Ocean –** Southern Ocean is an unbroken body of water with a rushing current that both isolates Antarctica's coastal ocean and provides essential chemical nutrients for the Antarctic ecosystem.
- **ACC –** The Antarctic Circumpolar Current (ACC) is the largest wind-driven current on Earth.
- It is the only current that goes all the way around our planet and connects the Atlantic, Pacific, and Indian Oceans.
- It is driven by strong westerly winds and was discovered by Edmund Halley.
- The ACC is a massive flow of water that acts as a barrier separating the Southern Ocean from more northern oceans.
- **World Circulation –** Antarctica is also the place where waters form that flow through the deep ocean as part of the Global Ocean Conveyor (World Circulation).
    - The global ocean conveyor belt is a constantly moving system of deep-ocean circulation driven by temperature and salinity.
- Water that flows at the bottom of the ocean is formed on the Antarctic continental shelf, particularly in the Weddell Sea and the Ross Sea.
- Different weather conditions a little further north at 45-55 degree south causes another water mass, called Antarctic Intermediate Water to form.

- In this area, precipitation is greater than evaporation, so the salinity of the water is low.

Ocean Currents	
• They are made up of horizontal and vertical components of the circulation system of ocean waters that is produced by gravity, wind friction, and water density variation in different parts of the ocean. • They are similar to winds in the atmosphere that transfer significant amounts of heat from Earth's equatorial areas to the poles and thus play important roles in determining the climates of coastal regions. • In addition, ocean currents and atmospheric circulation influence one another.	
Surface Currents	**Deep Ocean Currents**
• Large-scale surface ocean currents are driven by global wind systems that are fueled by energy from the sun. • These currents transfer heat from the tropics to the Polar Regions, influencing local and global climate. • The warm Gulf Stream originating in the tropical Caribbean, for instance, carries about 150 times more water than the Amazon River. • The current moves along the U.S. East Coast across the Atlantic Ocean towards Europe. • The heat from the Gulf Stream keeps much of Northern Europe significantly warmer than other places equally as far north.	• Differences in water density, resulting from the variability of water temperature and salinity, also cause ocean currents. • This process is known as thermohaline circulation. • In cold regions, ocean water loses heat to the atmosphere and becomes cold and dense. • When ocean water freezes, forming sea ice, salt is left behind causing surrounding seawater to become saltier and denser. • Surface water flows in to replace the sinking water, which in turn becomes cold and salty enough to sink. • This global set of ocean currents is a critical part of Earth's climate system as well as the ocean nutrient and carbon dioxide cycles.

References

1. Down To Earth – Antarctic Circumpolar Current
2. Britannica – Antarctic Circumpolar Current
3. Eurekalert – Evolution of the most powerful ocean current on Earth

Decision Support System (DSS)

The decision support system (DSS), which identifies sources of pollution in Delhi's air, will resume functioning from September this year with some new features.

- **Developed By –** DSS was developed by Indian Institute of Tropical Meteorology (IITM) Pune.
- **Model –** DSS is a numerical model-based framework to forecast Delhi's air quality and sources of local and regional pollution which can impact the air.
- **Utility –** The system gives forecasts the result of biomass burning activities in

neighbouring states.

- DSS enhances Delhi's air quality forecasting with updated 2023 emission inventory and VIIRS satellite for PM2.5 predictions.
- The system works only in winter and is stopped from March to August, currently forecasts the contribution of emissions in Delhi's air quality from 19 neighbouring districts.
- Now, the system will also forecast how Delhi's emissions impact the air of eight surrounding districts in NCR.
- The emissions inventory currently being used was last updated in 2018, however DSS has now received an updated emission inventory of 2023.

Delhi's air quality index (AQI) worsened to 325 from 303 a day ago, both in the very poor category, showed data from the Central Pollution Control Board (CPCB).

- The two models, System of Air Quality and Weather Forecasting And Research (Safar) and DSS, had temporarily stopped sharing data on air pollution for the country as there were differences between their forecasts and source contribution.

Quick Facts
Air Quality Index (AQI)
• AQI is a number used to communicate to the public how polluted the air currently is or how polluted it is forecasted to become. • As AQI increases, an increasingly large percentage of the population is likely to experience increasingly adverse health effects. • Different countries have their own air quality indexes, corresponding to different national air quality standards. • The AQI is most commonly used to describe ground-level ozone levels. • However, the AQI can be used to represent five pollutants that pose a threat to human health. • These pollutants are: 1. Ground-level Ozone or O3 2. Particulate Matter (soot and dust) or PM 3. Carbon Monoxide or CO 4. Sulphur Dioxide or SO2 5. Nitrogen Dioxide or NO2
System of Air Quality and Weather Forecasting and Research (SAFAR)
• SAFAR is an exceptional program to reduce air pollution in India and to improve the air quality index of metropolitan cities. • SAFAR is the first advanced air quality early warning system in India, introduced by the Ministry of Earth Sciences (MoES). • SAFAR provides location specific information on air quality in near real time and it is forecasted upto 3 days in India. • SAFAR was developed by the Indian Institute of Tropical Meteorology (IITM), Pune.

References

1. Times of India – System to identify pollution sources back
2. The Hindustan Times – DSS resumes sharing pollution source data
3. Times of India – IITM resumes sharing data on pollution sources

Domestic Systemically Important Insurers (D-SIIs)

The public sector insurance companies such as the Life Insurance Corporation of India (LIC) continue to be identified as Domestic Systemically Important Insurers (D-SIIs).

- **D-SIIs –** D-SIIs are insurance companies which are perceived as 'too big or too important to fail' (TBTF) based on their size, market importance, and domestic and global interconnectedness.
- Therefore, the continued functioning of D-SIIs is critical for the uninterrupted availability of insurance services to the national economy.

  LIC and New India are the largest life and general insurance companies in the country, respectively and General Insurance Corporation of India (GIC Re) is the sole Indian reinsurer.

- **Efforts –** Given the nature of their operations and the systemic importance of the D-SIIs, these insurers have to carry forward their efforts on the following:
  1. Raise the level of corporate governance.
  2. Identify all relevant risks and promote a sound risk management framework and culture.

  State Bank of India, ICICI Bank and HDFC Bank have been classified as domestic systemically important banks (D-SIBs).

- **RBI Framework –** The Reserve Bank had issued the Framework for dealing with Domestic Systemically Important Banks (D-SIBs).
- D-SIB framework requires the RBI to disclose the names of banks designated as D-SIBs starting from 2015 and place these banks in appropriate buckets depending upon their Systemic Importance Scores (SISs).
- Based on the bucket in which a D-SIB is placed, an additional common equity requirement has to be applied to it.

Quick Facts
The Insurance Regulatory and Development Authority of India (IRDAI)

• IRDAI is a government apex body responsible for regulation and developing the insurance industry in India.
• It was constituted as a statutory body as per the provisions of Insurance Regulatory and Development Authority Act 1999.
• The body was crated on the recommendations of the Malhotra Committee Report.
• All the companies wanting to run the insurance business in India are to be registered with the IRDAI.

References

1. Business Standard – Insurance companies retain the D-SII tag
2. Economic Times – New India identified as systemically important
3. The Hindu Business Line – LIC continues to be D-SIIs for 2023-24

Food Waste Index Report 2024

World wastes 1 billion meals a day, says U.N. report.

- **Authored By –** The report is jointly authored by the United Nations Environment Programme (UNEP) and WRAP (Waste and Resources Action Programme), a U.K.-based non-profit.
- The report was released ahead of the International Day of Zero Waste, observed on March 30.

In December 2022, the United Nations General Assembly (UNGA) designated March 30 as the International Day of Zero Waste, recognizing the critical need for global action on waste reduction and sustainable practices.

- The Food Waste Index tracks the global and national generation of food and inedible parts wasted at the retail and consumer (household and food service) levels.
- **UNEP –** The United Nations Environment Programme (UNEP) is its custodian.
- **Food Waste –** The report defines food waste as food and the associated inedible parts removed from the human food supply chain.
- **Food Loss –** Food loss is defined as all the crop and livestock human-edible commodities that directly/indirectly, completely exit the post-harvest production, excluding, the retail level.

As of 2022, only 2021 countries had included food loss/waste reduction in their climate plans or Nationally Determined Contributions (NDCs).

- **Findings –** Households across the globe wasted over 1 billion meals/day in 2022, as 783 million people struggled with hunger and a third of humanity faced food insecurity, according to the Food Waste Index Report 2024.
- The report stressed the importance of expanding and strengthening data infrastructure to enable the tracking and monitoring of food waste.
- The report pointed out that many low and middle income countries continue to lack

adequate systems for tracking progress to meet Sustainable Development Goal 12.3.

Sustainable Development Goal 12.3 – *By 2020, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.*

- Hotter countries appear to generate more food waste per capita in households, potentially due to higher consumption of fresh foods with substantial inedible parts and a lack of robust cold chains.
- The report found that food loss and waste generated 8-10% of annual global greenhouse gas (GHG) emissions, almost 5 times that of the aviation sector.
- Food waste also contributes to significant biodiversity loss by taking up the equivalent of almost a third of the world's agricultural land.
- It is estimated the roll of both food loss and waste on the global economy at $1 trillion.

At present, only four G-20 countries (Australia, Japan, U.K., and U.S.) and the European Union have food waste estimates suitable for tracking progress to 2030.

References

1. The Hindu – World wastes 1 billion meals a day
2. UNEP – Food Waste Index Report, 2024
3. UN – With 783 million people hungry, a 5th of all food goes to waste

Other Important Topics

Anthrax

Thailand recently gives warning after anthrax outbreak in Laos.
• It is a serious infectious disease caused by gram-positive, rod-shaped bacteria known as ***Bacillus anthracis***.
• It is also known as ***malignant pustule or woolsorter's disease.***
• It occurs naturally in soil and commonly affects domestic and wild animals around the world.
• It is a ***zoonotic disease,*** meaning that it is naturally transmissible from animals (usually vertebrae) to humans.
• The U.S. Food and Drug Administration has approved 2 vaccines, *BioThrax and Cyfendus,* to prevent disease.

Kuttanad wetland system

• Kuttanad is a delta region situated in the west coast of ***Kerala.***
• The Kuttanad Below Sea-level Farming System (KBSFS) is the ***only system in India that practices rice cultivation below sea level***.
• The rice fields, which are popularly known as ***"Puncha Vayals"*** exist in 3 landscape elements:

1. **Karapadam** (upland rice fields)
2. **Kayal** (wetland rice fields)
3. **Kari** (land buried with black coal like materials)

• The KWS is part of the larger ***Vembanad Kol wetland ecosystem***, which is a Ramsar Site.

CoViNet

CoViNet a network of global laboratories to identify and monitor potentially novel coronavirus of public health importance, was launched by W.H.O.
• The network will address a broader range of coronaviruses, including SARS-CoV-2, MERS-CoV and potential new coronaviruses.
• It currently comprises of 36 laboratories from 21 countries in ***all 6 WHO regions*** including 3 Indian laboratories.
• COVID-19 was the 1st ***'Disease X'*** and it may happen again.
• Disease X represents an unidentified virus that scientists warn could be 20 times more lethal than Covid-19.

Same sex marriage in Thailand

• Thailand is set to become the ***1st nation in Southeast Asia*** to legalize same-sex marriage.
• **1st Asian country** to legalise same-sex marriage - **Taiwan (2019)**.
• **1st South Asian country** to legalise same-sex marriage - **Nepal (2023)**.

Global Summit on Extreme Heat

• It is the ***1st Summit on Extreme Heat***.
• **Aim –** To find solutions to lessen impacts of extreme heat, save lives and mitigate costs as 2023 was the hottest on record.
• **Organized By –** United States Agency for International Development (USAID) and International Federation of Red Cross and Red Crescent Societies (IFRC).
• **Initiatives to combat extreme heat**

1. IFRC and USAID Extreme Heat Global Action Hub
2. Fire Grand Challenge Prize
3. Famine Early Warning Systems Network (FEWS NET)
4. Interactive Heat Exposure Projections Map
5. Guidance on Extreme Heat for Federal Agencies Operating Overseas and United States Government Implementing Partners
6. Toolkit for higher education, created by the University of Pennsylvania's Perry World House

Abel Prize

A French mathematician, Michel Talagrand was awarded the Abel Prize.

• The Abel Prize is an ***international award*** given ***annually to outstanding mathematicians.***
• It was established in **2002.**
• It aims to recognize groundbreaking scientific achievements in mathematics and to increase the status of the field in society.
• The prize is named after Norwegian mathematician ***Niels Henrik Abel (1802–1829)*** and is often called the "***Mathematician's Nobel Prize".***
• It is awarded by ***Norwegian Academy of Science and Letters***.

Global Trade Update report

The United Nations Conference on Trade and Development (UNCTAD) cited that the international trade is expected to rebound in 2024, reversing the 2023 downturn.

• The report was released by the ***United Nations Conference on Trade and Development (UNCTAD).***

• **Reasons for the economic growth in 2024**

1. Overall, moderating global inflation and improving economic growth forecasts suggest a reversal of the downward trends.
2. Additionally, rising demand for environmental goods should boost trade in 2024.

• **Findings in India (on an annual basis for 2023)**

1. The export growth saw a 6% contraction.
2. Services exports from India grew by 14%.
3. The services sector witnessed an 8% year-on-year growth, while trade in goods experienced a 5% decline compared to 2022.
4. The export growth saw a 6% contraction.
5. Services exports from India saw a 14% growth in 2023.

Bahais

• Bahais are members of a religious movement that ***originated in Iran*** in the 19th century.

• They believe that all religions come from the same source and that ***all people are equal, regardless of their race, gender, or nationality.***

• They also believe in the ***oneness of humanity*** and devote themselves to the abolition of racial, class, and religious prejudices.

• It has ***no priesthood*** and ***does not observe ritual forms*** in its worship.

Eturnagaram Wildlife Sanctuary

Telangana is presently grappling with forest fires in Tadvai region of Eturnagaram Wildlife Sanctuary in Mulugu and Amrabad Tiger Reserve.

• It was declared as a wildlife reserve **in 1953.**

• The vegetation here is tropical dry deciduous.

• The sanctuary is bordered by the ***Laknavaram Lake***.

• The perennial river ***Dayyam Vagu*** flows through this sanctuary.

• The sanctuary is also famous for the Sammakka Saralamma Jatara.

• Sammakka Saralamma Jatara is a tribal festival for honouring the goddesses' Sammakka and Saralamma.

Javan Tiger (Panthera tigris sondaica)

The Javan tiger, declared extinct in 2008, recently gave hope that a single hair found on the Java island in 2019 has been DNA-tested and is found to belong to the extinct species.

• **Distribution –** Javan Tiger is a now ***extinct*** subspecies of tiger endemic to the island of ***Java in Indonesia***.

• It was one of the 3 Indonesian tiger subspecies, the Javan tiger, the Bali tiger, and the Sumatran tiger, all evolved from a single tiger ancestor called the ***Sunda tiger.***

• **Distinction** – Javan tigers were smaller on average, closely related Bali tigers had long, thin stripes and a narrow face.

• **Habitat –** They lived in tropical forests, evergreen forests, mangrove swamps, grasslands, mountains and savannahs.

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