



CURRENT AFFAIRS -AUGUST 2019

PRELIMS EXCLUSIVE PROGRAMME (PEP)-2020





3 Idiots

All Izz Well

HD VIDEO

REVISION AND ITS IMPORTANCE

- **Approach of Today's Session!**
- **Familiarity with certain concepts/Movies example!- Article 14 vs Article 298?**
- **Retentivity- Long Term Gains!**
- **No Note Making in today's Class- Only Listening & Observing**
- **Assess Your Attentiveness & Mental Capacity-Today!**
- **SENSES AT WORK- How much can you Enjoy Listening and Mind-Mapping in your Mind?**



SURPRISE TEST

Direction: You have to mark (Correct or Incorrect) against the given statements:

- 1. Tribal Cooperative Marketing Development Federation of India (TRIFED) is a statutory body under Ministry of Tribal Affairs.**
 - 2. Mission Kakatiya is a Flagship scheme of Telangana Government**
 - 3. International Atomic Energy Agency's headquarter is in Geneva.**
 - 4. International Law Commission is a specialized agency of UN.**
 - 5. Great Indian Bustard is listed in CITES- Appendix I.**
 - 6. ASRAAM - Advanced Short-Range Air-to-Air Missile is the next generation infrared-guided missile of ISRAEL.**
 - 7. Indian Deep Space Network (IDSN) hub is located at Byalalu, a village near Bangalore, Karnataka.**
 - 8. Kamchatka Peninsula is in Atlantic Ocean.**
 - 9. Waorani Tribe belongs to Central Africa.**
-
- 10. Delhi Government has started the world's first Emission Trading System to curb air pollution.**
 - 11. Kapu is social grouping of agriculturists found primarily in the state of Tamilnadu.**
 - 12. Global Financial Stability Report is released by WEF**
 - 13. Fiscal Performance Index is released by World Bank**
 - 14. Ottamthullal is an art form of Karnataka.**
 - 15. Chagos island is in Pacific Ocean.**



LEARNING FROM SURPRISIE TEST

?????



Covering Current Affairs Through UPSC Prelims PYQs THEMES

DON'T OVER DO CURRENT AFFAIRS- **RESTRICT YOUR SOURCES (What is Poison?)**

FOCUS ON PEP CONTENT- **HANDOUTS, TESTS CONCEPTS AND CLASSES.**

HUNDREDS OF TOPICS FOR EACH MONTH DOESN'T MEAN **QUALITY AND NEED** IS MET!

UPSC PRELIMS PREVIOUS YEARS QUESTIONS- **YOUR BEST COMPANION**

LET'S START!



THEMES IN CURRENT AFFAIRS

SCIENCE & TECHNOLOGY

ENVIRONMENT

HISTORY

ECONOMY

GEOGRAPHY

POLITY, NATIONAL AND INTERNATIONAL DEVELOPMENTS



PRIORITIES & INTERCONNECTIONS??

Do you know?

Most of the Questions in UPSC Prelims are from Current Affairs?

Majority of Questions from Science & Tech, Environment and Geography (Location, Resources etc.)

Even Economy, National and International Developments-Current Affairs!



PHILOSOPHY OF PRELIMS

Questions based on?

- Standalone Concepts/Facts
-
- Interconnections
 - Applications Based



PYQs-Theme Analysis

Q.) With Reference to the management of minor minerals in India, consider the following statements:

- 1. Sand is a 'minor mineral' according to the prevailing law in the country.**
- 2. State Governments have the power to grant mining leases of minor minerals, but the powers regarding the formation of rules related to the grant of minor minerals lie with the Central Government.**
- 3. State Governments have the power to frame rules to prevent illegal mining of minor minerals.**

Which of the statements given above is/are correct?

-
- (a) 1 and 3 only
 - (b) 2 and 3 only
 - (c) 3 only**
 - (d) 1, 2 and 3



WHAT DO YOU UNDERSTAND BY INTERCONNECTIONS IN CURRENT AFFAIRS STUDY?

Example?

Li-Ion Batteries in News!

Kinds of Questions that can be asked?

Let's Decode!



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Background

- **Is Lithium the Oil of 21st Century?**
 - **Importance of Li for India?- Energy Security, Clean Energy etc.**
 - **Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles (FAME) Scheme**
-
- **Lithium Mines in India? imported batteries, mostly from China.**
 - **Electric Vehicle, Mobile Phones, Solar Panels-uses.**



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Lithium Triangle- Argentina, Chile and Bolivia. India has signed a Memorandum of Understanding (MoU) with Bolivia, which provides it with access to the lithium reserves of the country. Bolivia, estimated to hold over 60 per cent of the world's reserves for lithium.

The Nobel Prize in Chemistry 2019 is awarded to John B. Goodenough, M. Stanley Whittingham and Akira Yoshino for their **contributions to the development of the lithium-ion battery.**

China -- the largest electric vehicle market in the world. India has complete dependency on China as of now.

China is the largest producer of Lithium-ion battery/cells in the World.





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Properties of Lithium

Highly Reactive, less abundant in nature, two isotopes, does not occur in elemental form

Not present or occur in Elemental Form. Why?

Lightest metal and reducing agent.

No production in India.

-
-



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Iron-ion Battery-in news (can India focus here?)

Energy density is measured in watt-hours per kilogram (Wh/kg) and is the amount of energy the battery can store with respect to its mass.

The redox potential (potential to lose or gain electrons) of iron ion is higher than lithium ion.

The radius of the Fe^{2+} ion is nearly the same as that of the lithium ion.

Iron is more stable during the charging process and therefore prevents short-circuiting of the batteries.

When more iron ions bind to the cathode, more energy (higher energy density) can be stored in the battery.

.



WHAT DO YOU UNDERSTAND BY INTERCONNECTIONS IN CURRENT AFFAIRS STUDY?

Cobalt

Lithium-cobalt-oxide is used as cathode in rechargeable batteries.

Odisha has the largest cobalt reserves in India followed by Jharkhand.

Congo has the largest reserve in the World followed by Australia. It is imported

No production in India yet



WHAT DO YOU UNDERSTAND BY INTERCONNECTIONS IN CURRENT AFFAIRS STUDY?

Environmental Impact of Lithium Mining



WHAT DO YOU UNDERSTAND BY INTERCONNECTIONS IN CURRENT AFFAIRS STUDY?

Environmental Impact of Lithium Mining

Miners drill holes into salt flats to pump salty, mineral-rich brine to the surface.

Li-Carbonate collection takes not less than 18 months from these holes.

Destroying local habitats and polluting nearby grasslands and rivers, with **hydrochloric acid** being used in the lithium process.

Water consumption associated with lithium mining

Toxic chemicals are needed to process lithium

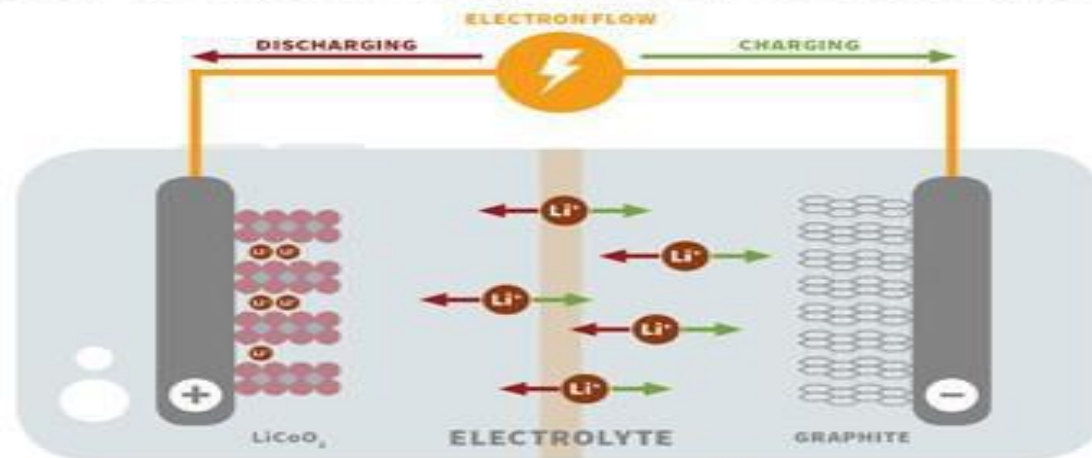


WHY LITHIUM-ION BATTERIES CATCH FIRE

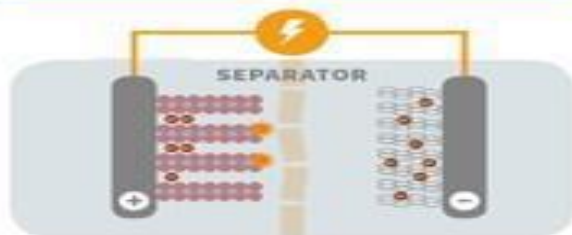
Lithium-ion batteries have been in the news recently with reports of some of Samsung's phones unexpectedly catching fire. Here, we examine how the batteries work and what can make them ignite.

HOW THEY WORK

Lithium-ion batteries often use lithium cobalt oxide (LiCoO_2) as the positive electrode and graphite as the negative electrode. When the batteries charge, lithium ions and electrons move from the positive to the negative electrode. When they discharge, the ions and electrons move from the negative to the positive electrode, powering phones and other devices. The ions move through an electrolyte, typically made of a lithium salt dissolved in an organic liquid.

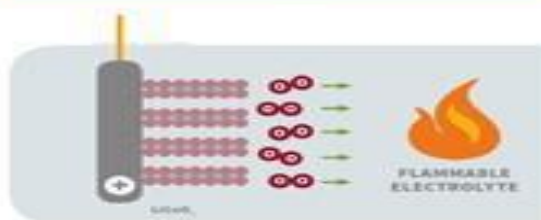


SHORT-CIRCUITING



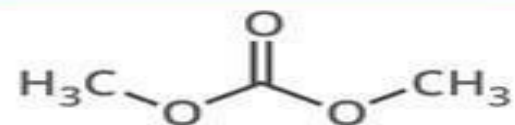
A porous separator keeps the battery electrodes apart. Charging the battery for long periods or inflicting a mechanical blow can damage the separator, causing the battery to discharge rapidly and generate a lot of heat.

OVERCHARGING



When overcharged, lithium cobalt oxide releases oxygen. This can react with the flammable electrolyte and also with cobalt oxide (Co_3O_4) left over after the release of oxygen. Co_3O_4 also increases the resistance of the battery, raising the risk of overheating.

ELECTROLYTE BREAKDOWN



DIMETHYL CARBONATE

Common electrolyte substance

During charging, some of the organic molecules in the electrolyte can break down, forming carbon dioxide. Because the battery is sealed, this causes pressure to build up. If it gets high enough, the battery bursts, exposing the flammable electrolyte.



LEARNINGS!

One Topic of Li-ion Batteries You Prepared!

Geography- Location of Li Reserves (Lithium Triangle etc)

Economy- Export and Import

International Relations- Diplomacy

National Developments- Focus on Energy Security, FAME Scheme

Science- Working of Batteries, Properties of Li, Co, Fe etc.

Environment- Safety Issues- Industrial Waste Disposal (Waste Management)

Miscellaneous- Contemporary aspects like Nobel Prize in Chemistry etc.



PYQs-Theme Analysis

Q.) Atal Innovation Mission is set up under the? PRELIMS 2019

(a) Department of Science and Technology

(b) Ministry of Employment

(c) NITI Aayog

(d) Ministry of Skill Development and Entrepreneurship

Factual Questions-Theme





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**COMPOSITE WATER MANAGEMENT
INDEX 2019**



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COMPOSITE WATER MANAGEMENT INDEX 2019

Context- CWMI released for States and UT's by **NITI AAYOG**-Even on this fact, UPSC can ask question!

- Nine Themes- 25 States and 2 UT's (**Not all the States and UT's of India**)

Interconnections

- **SDG- 6:** "Ensure availability and sustainable management of water and sanitation for all"
- **Water Crisis in India-Groundwater Depletion, Heavy Metal Toxicity etc.**

-
- **BRAINSTROMING-** Do not try to mug everything. Remember the Context and Interconnections properly. That is enough!



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COMPOSITE WATER MANAGEMENT INDEX 2019

MORE THAN HALF THE STATES FOUND SEVERELY LACKING

16 of 27 states studied scored below 50 on the index. These 16 states accounted for 48% of India's population, 40% of the national agricultural produce, and 36% of the national economic output

Niti Aayog's water management index scored states on nine indicators, including restoration of water bodies, groundwater, irrigation practices, sustainable farming, rural and urban water supply, and policy and governance

- High performing: >65
- Medium performing: 50-65
- Low performing: <50





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National Essential Diagnostics List (NEDL)



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National Essential Diagnostics List (NEDL)

Context- First National Essential Diagnostics List (NEDL) finalized by **the Indian Council of Medical Research (ICMR)**-Even on this fact, UPSC can ask question!

- AIM- **to bridge the current regulatory system's gap that do not cover all the medical devices and in-vitro diagnostic device (IVD).**
- **The list is meant for facilities from village till the district level (Don't get confused with the word "NATIONAL". It covers local levels like villages and districts as well.**
- **First country to do so in the World (Important Fact)**
- **The list also encompasses tests relevant for new programmes such as Health and Wellness Centres (HWCs) under the Pradhan Mantri Jan Arogya Yojana.**

Interconnections

- **National Pharmaceutical Pricing Authority (NPPA)**
- **WHO- Essential Diagnostics List (EDL) IN 2018**
- **In India, diagnostics (medical devices and in vitro diagnostics) follow a regulatory framework based on the drug regulations under the Drugs and Cosmetics Act, 1940 and Drugs and Cosmetics Rules 1945.**
- **Diagnostics are regulated under the regulatory provisions of the Medical Device Rules, 2017.**





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**Khadi & Village Industries Commission
(KVIC)**



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Khadi & Village Industries Commission (KVIC)

Context- Khadi Village turnover crosses ₹74,323 crore in 2018-19

- A **statutory body** established by an Act of Parliament (**FORMED IN 1957**)
- *An apex organization under the Ministry of Micro, Small and Medium Enterprises.*

Interconnections

- The Khadi production, which was ₹879.98 crore in 2014-15, went up to ₹1,902 crore in 2018-19, a growth of more than 100% (Can be asked in one of the statements (trends of Khadi production in **India-increasing or decreasing**)
- **KVIC trying to protect "Charkha Symbol"**
- **PARIS CONVENTION-** Protection of Industrial Properties (1883)
- **WIPO-** Protection of Intellectual Properties (1967)





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SAN-SADHAN HACKATHON



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SAN-SADHAN HACKATHON

Context- Organized jointly by the Ministry of Jal Shakti and the Department of Empowerment of Persons with Disabilities, in collaboration with Atal Innovation Mission, NITI Aayog.

- Aim- initiative to ease lives of Persons with Disabilities (Divyangjan) by making **toilets smarter, more accessible, and easier to use.**
- *It is an initiative under the Swachh Bharat Mission (SBM).*

Interconnections

- Department of Drinking Water and Sanitation, Ministry of Jal Shakti.
- **India's rural sanitation coverage has increased from 39% in 2014 to over 99% as of August 2019-SBM**

There was a question on **Smart India Hackathon 2017** in UPSC Prelims 2017





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NATIONAL TIME RELEASE STUDY (TRS)



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NATIONAL TIME RELEASE STUDY (TRS)

Context- India conducted, 1st National Time Release Study to enable faster movement of cargo across borders to benefit traders.

- Will help in Ease of Doing Business

Interconnections

- TRS is an internationally recognized tool advocated by **World Customs Organization** to measure the efficiency and effectiveness of international trade flows.
- **WORLD CUSTOM ORGANIZATION (WCO)**-Intergovernmental organization in 1952, Brussels, Belgium.
- The WCO maintains the International Harmonized System (HS) goods nomenclature, and administers the technical aspects of the World Trade Organization (WTO) Agreements on Customs Valuation and Rules of Origin.
- TIR CONVENTION- UNECE-ECOSOC



PYQs-Theme Analysis

Q.) The Global Competitiveness Report is published by the

(a) International Monetary Fund

(b) United Nations Conference on Trade and Development

(c) World Economic Forum

(d) World Bank

THEME- REPORTS/INDICES PUBLISHED BY?



PYQs-Theme Analysis

Q.) In the context of which one of the following are the terms 'pyrolysis and plasma gasification' mentioned?

- a) Extraction of rare earth elements
- b) Natural gas extraction technologies
- c) Hydrogen fuel-based automobiles

d) Waste-to-energy technologies

THEMES- Applications, Emerging Technologies, Associated Concepts!





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**Sulphur Dioxide Emissions REPORT BY
Green Peace**



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Sulphur Dioxide Emissions REPORT BY Green Peace

Context- India is the largest SO₂ emitter in the World. (Important Fact)

- Almost all of these emissions in India are because of Coal Burning.
- SO₂ Emission- extracting metal from ore; running of locomotives, ships and other vehicles that burn fuel with a high sulfur content, natural sources such as volcanoes.

Interconnections

- Flue-gas Desulphurisation Technology-Dry and Wet Scrubbing
- Individual hotspots: the Norilsk smelter site in Russia continues to be the **largest anthropogenic SO₂ emission hotspot in the world**, followed by the Kriel area in Mpumalanga province of South Africa, Zagroz in Iran, and Rabigh in Saudi Arabia. Singrauli in Madhya Pradesh is at number five.

BRAINSTROMING

- Report released by?
- Emerging Technology,
- Locations,
- Emission Sources



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Sulphur Dioxide Emissions REPORT BY Green Peace

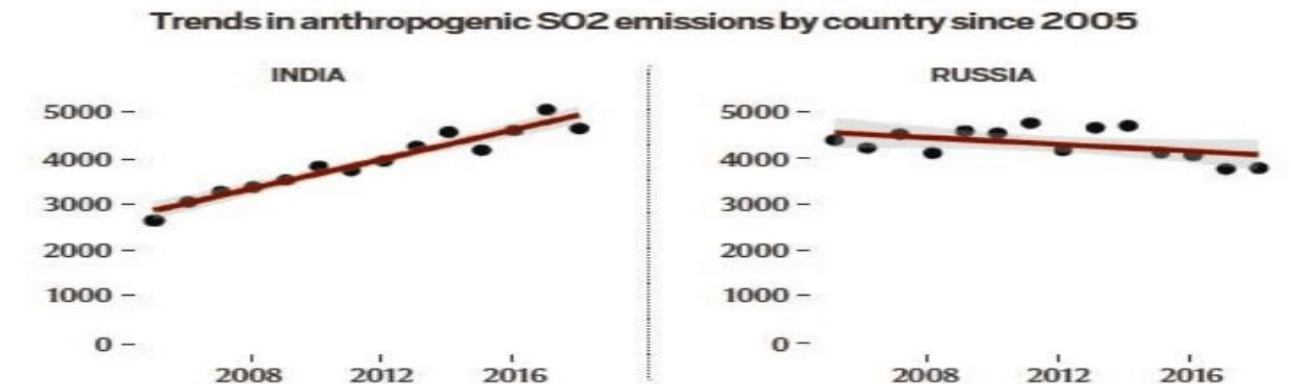
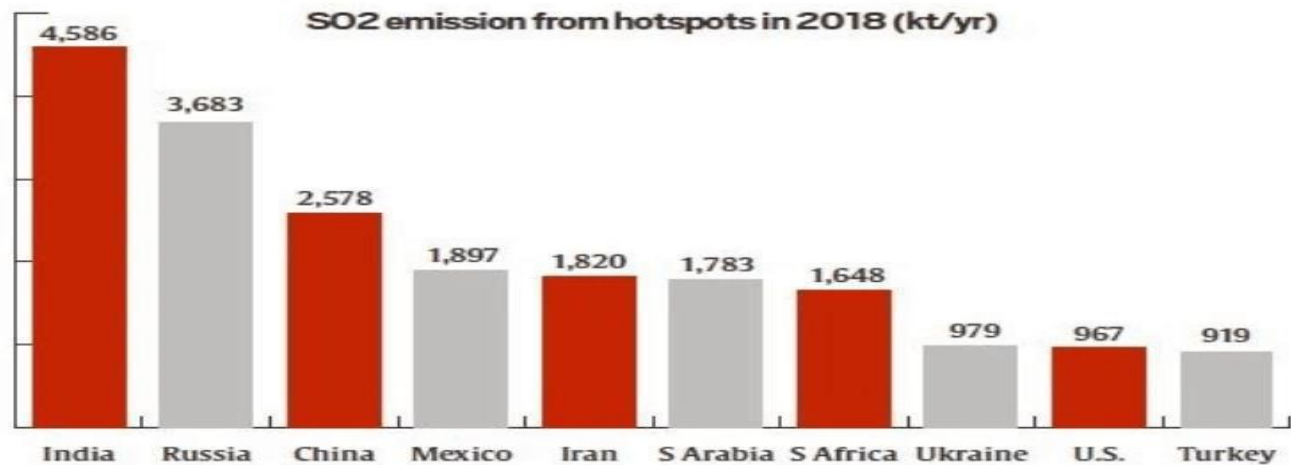
CHOKING THE ATMOSPHERE

India's worst emission hotspots	(kilo tonne/year)
Singrauli	507
Talcher	347
Jharasuguda	201
Chennai	215
Visakhapatnam	171
Ramagundam	157



TALCHER COAL MINE

● China's success in reducing SO₂ emissions has made Russia the second highest emitter after India



PYQs-Theme Analysis

Q.) Which of the following are in Agasthyamala Biosphere Reserve?

a) Neyyar, Peppara and Shendurney Wildlife Sancturies; and Kalakad Mundanthurai Tiger Reserve

b) Mudumalai, Sathyamagalam and Wayanad Wildlife Sanctuaries; and Silent Valley National Park

c) Kaundinya, Gundla Brahme-swaram and papikonda Wildlife Sancturies; and ~~Mukurthi National park~~

d) Kawal and Sri Venkateswara Wildlife Sanctuaries; and Nagarjunasagar-Srisailem Tiger Reserve



PYQs-Theme Analysis

Q.4) In which one of the following States is Pakhui Wildlife Sanctuary located?

(a) Arunachal Pradesh

(b) Manipur

(c) Meghalaya

(d) Nagaland

TAKEWAYS- Every Year, UPSC asks questions on National Park, WLS, Tiger Reserves, Biosphere Reserves etc.





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Ratapani Tiger Reserve



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Ratapani Tiger Reserve

Context- To be Declared as 7th TR of Madhya Pradesh (also known as Tiger State-Highest Tigers in India)

Interconnections

- **How many TRs in India?**
- **Name the Six TR of Madhya Pradesh?**
 - Bandhavgarh Tiger Reserve
 - Bori-Satpura Tiger Reserve
 - Kanha Tiger Reserve
 - Panna Tiger Reserve

 - Pench Tiger Reserve
 - Sanjay-Dubri Tiger Reserve
- **Recent Tiger Census**
- **NTCA**
- **Global Tiger Forum**





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Khangchendzonga Biosphere Reserve



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Khangchendzonga Biosphere Reserve

Context- Added to UNESCO's World Network of Biosphere Reserves, making it the 11th Biosphere in India to be included in the network. **(Where is it located?)**

In 2016 it was recognized for its tangible as well as intangible heritage as a **UNESCO Mixed Heritage Site**, the first such site in India designated both for cultural and natural significance.

Interconnections

- Lepcha, Bhutia, Nepalese and Limboo communities
 - Tholung Monastery- Buddhist
 - Temperate broadleaf and mixed forests and Alpine grasses and shrubs at higher altitudes
-
- Musk Deer, Red Panda and Snow Leopard are found here.
 - The last biosphere reserve to be included was the Agasthyamalai Biosphere Reserve in Kerala in 2016.
 - The Nilgiri Biosphere Reserve was the first reserve from the country to be included in the WNBR.
 - India has 18 biospheres reserves, of which 11 have been included in the WNBR.
 - **Revise- Wildlife Sanctuaries of Sikkim**



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Burachapori-Laokhowa Wildlife Sanctuary

Context- Lost Rhino from here

Near Kaziranga National Park, Brahmaputra River -Assam

Interconnections

- Pobitora Wildlife Sanctuary
 - Nambor Wildlife Sanctuary
 - Laokhowa-Bura Chapori Wildlife Sanctuary
-
- Orang National Park
 - Nameri National Park
 - Manas National Park



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Udanti Wildlife Sanctuary

Context- Translocation of Wild Buffaloes and Decline in Leopard/Tiger Population

Wild Buffaloes- IUCN?

Wildlife Protection Act, 1972?

Wildlife Trust of India?

Interconnections

- Indravati National Park
- Sitanadi Wildlife Sanctuary
- Pamed Wildlife Sanctuary



PYQs-Theme Analysis

Q.) The word 'Denisovan' is sometimes mentioned in media in reference to

- a) fossils of a kind of dinosaurs
- b) an early human species**
- c) a cave system found in North-East India
- d) a geological period in the history of Indian subcontinent

Takeaway- Focus on terms in news which are directly overlapping the respective themes



PYQs-Theme Analysis

Q.) Which of the following adopted a law on data protection and privacy for its citizens known as "**General Data Protection Regulation**" in April 2016 and started implementation of it from 25th May, 2018?

a) Australia

~~b) Canada~~

c) The European Union

d) The United States of America



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IMPORTANT TERMS IN NEWS

Special Data Dissemination Standard: is an International Monetary Fund standard to guide member countries in the dissemination of national statistics to the public.

Astana Consensus: Sidelines of SCO Summit, India and China Meeting on Resolving Disputes.

Special Purpose Trust Fund: India contributed 1 million dollars to SPTF of UN

Damaram: Ancient musical instrument

Menhirs: A tall upright stone of a kind erected in prehistoric times in western Europe. Also, found in India recently.



AUGUST 2019

IMPORTANT TERMS IN NEWS

Damaram: Ancient musical instrument



Menhirs: A tall upright stone of a kind erected in prehistoric times in western Europe. Also, found in India recently.



PYQs-Theme Analysis

Q.) Consider the following pairs:

Towns sometimes mentioned in news Country

1. Aleppo - Syria
2. Kirkuk - Yemen
3. Mosul - Palestine
4. Mazar-i-sharif - Afghanistan

~~Which of the pairs given above are correctly matched?~~

- a) 1 and 2
- b) 1 and 4**
- c) 2 and 3
- d) 3 and 4



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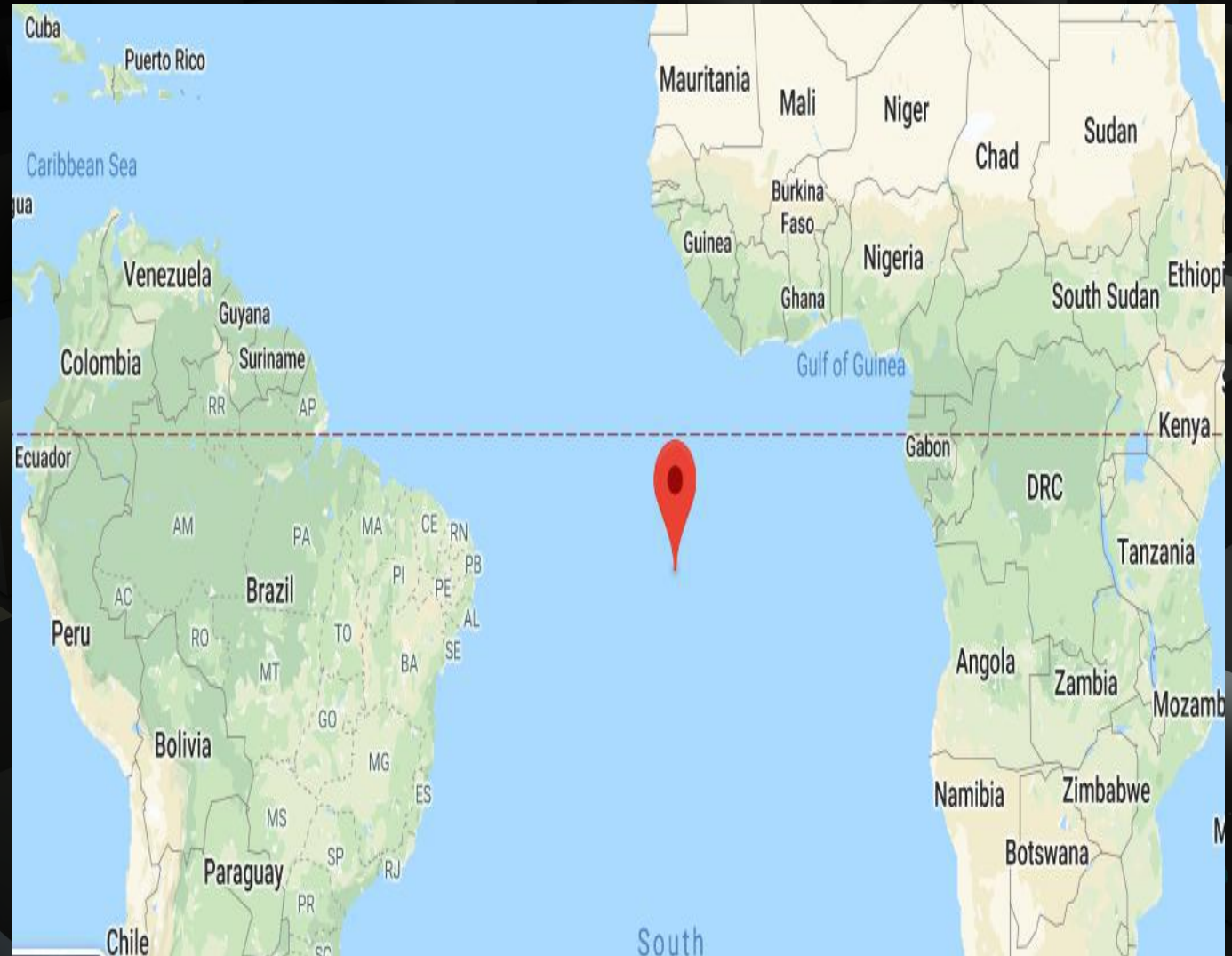
IMPORTANT PLACES IN NEWS

Ascension Island

- To be declared as Marine Protected Area
- Middle of South Atlantic Ocean.

Do You Know?

- Marine Protected Area (MPA)
- Largest in the World- Ross Sea in Antarctica
- Great Barrier Reefs-Australia



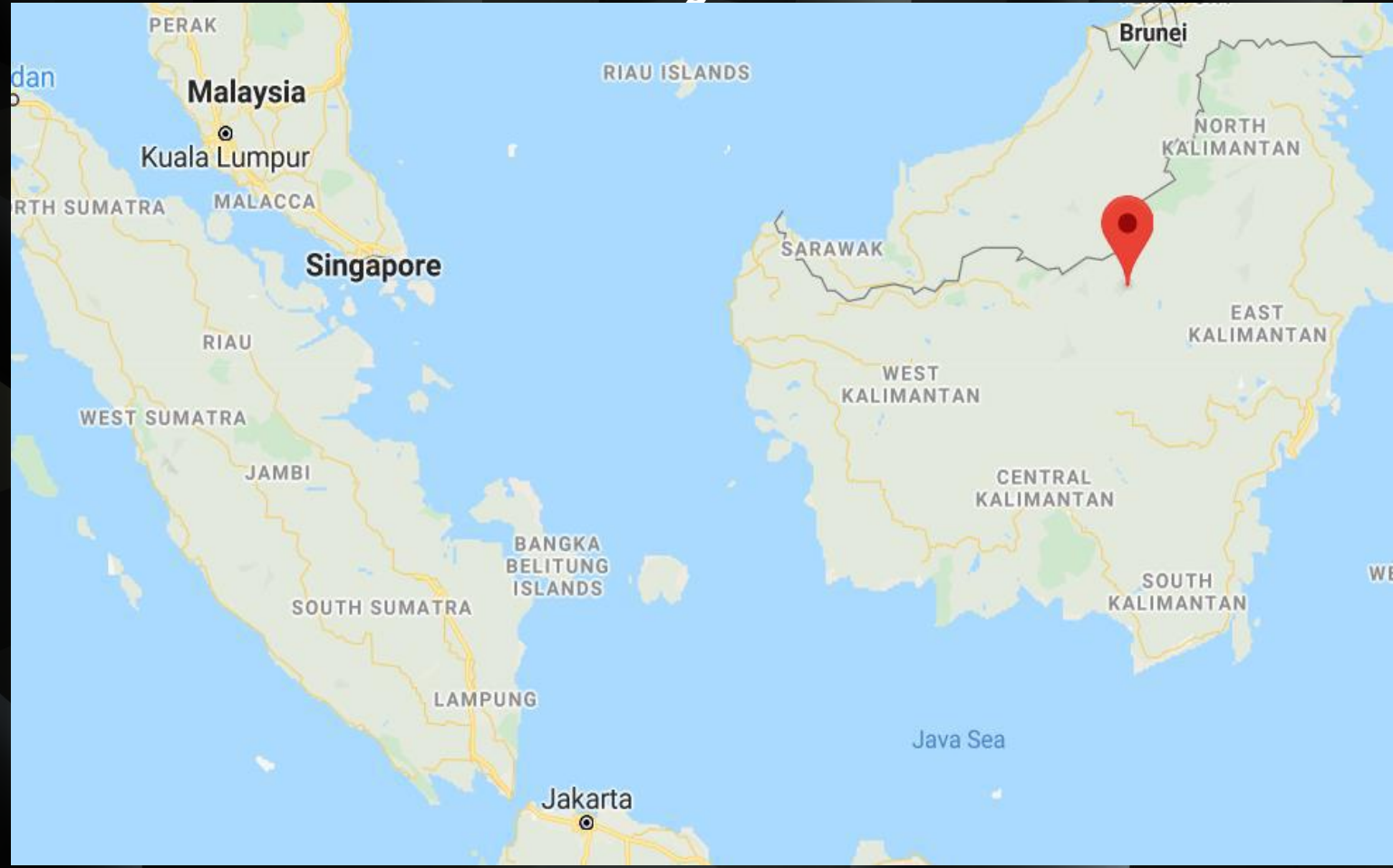
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IMPORTANT PLACES IN NEWS



Jakarta and Borneo

- Jakarta, the capital of Indonesia is sinking and Borneo is planned to be the new capital.
- Borneo, a sparsely populated island that is home to some of the world's last large stretches of rainforest.
- Kalimantan Province



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IMPORTANT PLACES IN NEWS



EGYPT TO BLACK SEA- ANCIENT ROUTE

Mediterranean Sea–Aegean Sea- Dardanelles Strait --Sea of Marmara-Bosphorous Strait-Black Sea

TRICKS

Black Sea: The BURGeR

(Turkey, Bulgaria, Ukrain, Russia, Georgia, Romania)

Red Sea: DESSEY

(Djibouti, Eritrea, Saudi Arabia, Sudan, Egypt, Yemen)

Caspian Sea: TARIK

(Turkmenistan, Azerbaijan, Russia, Iran, Kazakhstan)



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IMPORTANT PLACES IN NEWS

Clarion-Clipperton Zone

- In news for Deep Sea Mining
- Pacific Ocean- East Pacific

Interconnections

- International Seabed Authority- Intergovernmental Org-Jamaica
 - Established by UNCLOS- International Agreement-Jamaica
-
- International Maritime Organization- London



PYQs-Theme Analysis

Q.) Consider the following pairs:

Famous place	River
--------------	-------

- | | |
|--------------------|----------------|
| 1. Pandharpur | : Chandrabhaga |
| 2. Tiruchirappalli | : Cauvery |
| 3. Hampi | : Malaprabha |

Which of the pairs given above are correctly matched?

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3



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IMPORTANT PLACES IN NEWS



Bharati Huda

- Odisha- Excavation Site by ASI
- A rural settlement had thrived at the site about 3600 years ago.
- Chalcolithic Culture-Copper and Stone

Apusiajik Glacier: Greenland, Melting very fast

Herat City- Afghanistan (Kabul, Kandahar, Ghazni etc.)

Port Velho City- Amazon Fire (Brazil)

Kremlin- Russia

The Pallikaranai Marshland (Bay of Bengal), the only urban wetland of Chennai city, had miserably shrunk from its expanse of 5,500 hectares recorded in 1965 to just about 600 hectares.

LAMBAHRAUN LAVA FIELD: NASA has chosen the Lambahraun lava field in **Iceland** as the site to prepare for the next mission to Mars in 2020

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IMPORTANT PLACES IN NEWS



Pamba River

- Third Longest River in South India-Kerala after Periyar and Bharathappuzha. Western Ghats
- Sabrimala-Important Place
- The river is also known as 'Dakshina Bhageerathi'.
- During ancient times it was called 'River Baris'.

Tawi River

- Flows through Jammu
- The flow of water in the river has been decreasing in recent years as the source glacier (Kailash Kund glacier) has been retreating.

The Kavalappara Landslide in the western Ghats -Wayanad, Kerala killing more than 15 people.

Gandhamardhan Hills- in Western Odisha (Landslide)

PYQs-Theme Analysis

Q.6) With reference to the governance of public sector banking in India, consider the following statements:

- 1. Capital infusion into public sector banks by the Government of India has steadily increased in the last decade.**
- 2. To put the public sector banks order, the merger of associate banks with the parent State Bank of India has been affected.**

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**
-



PYQs-Theme Analysis

Q.) Among the agricultural commodities imported by India, which one of the following accounts for the highest imports in terms of value in the last five years?

- (a) Spices
 - (b) Fresh fruits
 - (c) Pulses
 - (d) Vegetable oils**
-



PYQs-Theme Analysis

Q.) Among the following, which one is the largest exporter of rice in the world in the last five years?

- (a) China
- (b) India**
- (c) Myanmar
- (d) Vietnam



AUGUST 2019

ECONOMY-TRENDS & FACTS

Agri-export and import commodity in India

TABLE 2: INDIA'S IMPORT OF AGRICULTURAL COMMODITIES

	2013-14	2016-17	2017-18	2018-19	APR-SEP 2018	APR-SEP 2019
Vegetable oils	7,249.85	10,892.75	11,637.48	9,890.32	5,334.64	4,740.89
Pulses	1,828.16	4,244.13	2,908.33	1,140.76	445.72	670.81
Fresh fruits	1,273.44	1,682.88	1,942.92	1,987.58	921.97	875.44
Cashew	774.12	1,347.13	1,419.51	1,610.56	1,217.88	849.32
Raw Cotton	394.47	946.88	979.32	633.05	420.34	990.6
Spices	571.36	858.95	990.7	1,135.44	517.67	751.94
Sugar	392.18	1,021.81	936.52	449.03	255.66	170.05
Natural Rubber	906.41	652.57	829.15	873.26	464.53	402.45
Wheat	4.42	1,268.64	364.5	0.77	0.68	0.43
TOTAL*	15,528.94	25,643.4	24,890.9	20,920.34	11,142.39	11,225.26

*Includes other farm commodities. Source: Department of Commerce. (IN MILLION DOLLARS)



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ECONOMY-TRENDS & FACTS

TABLE 1: INDIA'S EXPORT OF AGRICULTURAL COMMODITIES

	2013-14	2016-17	2017-18	2018-19	APR-SEP 2018	APR-SEP 2019
Marine products	5,016.46	5,903.06	7,389.22	6,802.56	3,467.52	3,355.53
Basmati rice	4,864.69	3,208.6	4,169.56	4,712.44	2,247.34	2,031.33
Buffalo meat	4,350.23	3,903.49	4,037.11	3,587.15	1,890.65	1,599.87
Non-Basmati rice	2,925.05	2,525.19	3,636.6	3,038.16	1,577.02	1,017.31
Spices	2,497.22	2,851.95	3,115.37	3,322.45	1,587.69	1,962.71
Raw Cotton	3,637.53	1,621.11	1,894.25	2,104.41	929.59	226.6
Fruits & Vegetables*	1,563.88	1,684.51	1,687.59	1,732.21	797.08	745.44
Oilseeds**	1,291.67	1,355.23	1,174.35	1,156.76	554.08	480.73
Oilmeals	2,796.34	8,05.45	1,093.16	1,508.65	591.9	423.58
Castor oil	725.68	674.73	1,043.99	883.78	445.41	523.11
Coffee	798.8	842.84	968.57	822.34	429.86	392.64
Tobacco	1,011.35	958.69	934.25	981.34	492.97	485.64
Processed F&V	760.16	848.36	929.79	933.61	450.05	451.04
Cashew	848.65	793.49	927.47	658.3	314.21	282.73
Tea	798.76	731.26	837.36	830.93	386.11	444
Sugar	1,177.03	1,290.71	810.9	1,360.29	490.83	808.03
Guargum meal	1,979.63	463.35	646.94	674.88	355.38	260.23
Dairy products	727.52	253.73	303.05	481.55	180.57	152.23
Other Cereals	1,204.11	212.3	248.59	348.97	208.83	96.8
Wheat	1,569.03	66.85	96.72	60.24	20.84	29.21
TOTAL***	43,251.66	33,696.83	38,897.21	39,203.53	19,023.13	17,289.73

*Includes seeds; **Includes groundnut, sesame and niger; ***Includes other farm commodities. (IN MILLION DOLLARS)



AUGUST 2019

ECONOMY-TRENDS & FACTS

Agri-export and import commodity in India

*From export perspective, **groundnut and sesame seeds** are the two most important oilseeds for India. While groundnut accounted for major share of total exports of oilseeds to the tune of about 47% during 2018-19, sesame seed accounted for a share of about 30% in total oilseed exports in quantitative terms*



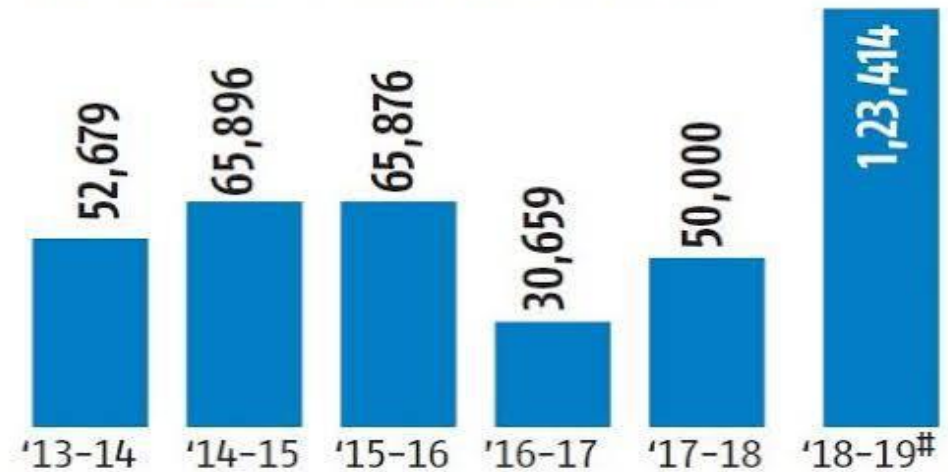
AUGUST 2019

ECONOMY-TRENDS & FACTS

RBI Surplus Transfer

Is it a steady increase or decrease?

RBI SURPLUS TRANSFERRED TO THE GOVERNMENT ₹ crore



Additional amount of ₹52,637 crore is transferred for excess provisions identified according to the revised Economic Capital Framework (ECF) adopted at the meeting of the central board
Compiled by BS Research Bureau Source: RBI annual reports





AUGUST 2019

ECONOMY-TRENDS & FACTS

Retail Loans-Share?

- **Public Sector Banks**
 - **Private Sector Banks**
 - **Non-Banking Financial Institutions (NBFCs)**
-
- **Other Banks**



AUGUST 2019

ECONOMY-TRENDS & FACTS

Retail outstanding Loans-Share

PSU>NBFCs>PRIVATE>OTHERS

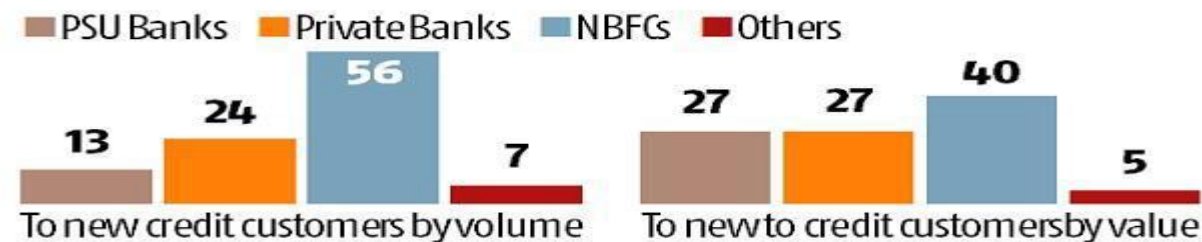
New Credit Loan Share?

NBFCs>Private Bank>PSU

Share of outstanding retail loans by value in FY19 (%)

	Retail consumer	Retail home	Retail business	Retail agriculture	Total retail
PSU banks	39	38	19	73	39
Private banks	37	19	32	14	26
NBFCs	18	41	42	4	30
Others	6	3	7	10	6

Share of new retail loans in FY19 (%)



PYQs-Theme Analysis

Q.10) Consider the following pairs:

**Community sometimes
mentioned in the news**

In the affairs of

1. Kurd
2. Madhesi
3. Rohingya

Bangladesh
Nepal
Myanmar

Which of the above pairs is/are correctly matched?

- a) 1 and 2
- b) 2 only
- c) 2 and 3
- d) 3 only





AUGUST 2019

Tribes/Communities

August 9 is celebrated as the International Day of the World's Indigenous Peoples or **World Tribal Day**.

Ekuri Community- Nigeria-Conservation of Gorillas

Wanchuwa Festival And **Tiwa Tribe**- Assam

Saharia Tribe-Madhya Pradesh

Tikuna- The largest Amazonian tribe in Brazil is the Tikuna. (Awa, and Guarani)



AUGUST 2019

GI Tags

Palani Panchamirtham- This is the first time a temple 'prasadam' from Tamil Nadu has been bestowed with the GI tag.

food that is a religious offering

Mizo Puanchei is a colourful Mizo shawl and is considered as the most colourful among the Mizo textiles.

Tawlhlohpuan, a medium to heavy, compactly woven, good quality fabric from Mizoram is known for warp yarns, warping, weaving & intricate designs that are made by hand. Tawlhloh, in Mizo language, means 'to stand firm or not to move backward'

Kandangi Saree- GI Tag-Tamilandu

Dindigul Lock-GI Tag-Tamilandu

Tirur Vettila (Betel leaf)-GI Tag -Kerala



PYQs-Theme Analysis

Q.) Which one of the following statements is not correct?

- a) Hepatitis B virus is transmitted much like HIV.
- b) Hepatitis B, unlike Hepatitis C, does not have a vaccine.**
- c) Globally, the numbers of people infected with Hepatitis B and C viruses are several times more than those infected with HIV.
- d) Some of those infected with Hepatitis B and C viruses do not show the symptoms for many years.



PYQs-Theme Analysis

Q.) With reference to the recent developments in science, which one of the following statements is not correct?

a) Functional chromosomes can be created by joining segments of DNA taken from cells of different species.

b) Pieces of artificial functional DNA can be created in laboratories.

c) A piece of DNA taken out from an animal cell can be made to ~~replicate outside a living cell~~ in a laboratory.

d) Cells taken out from plants and animals can be made to undergo cell division in laboratory petri dishes.



PYQs-Theme Analysis

Q. Consider the following statements:

1. In tropical regions, Zika virus disease is transmitted by the same mosquito that transmits dengue.
2. Sexual transmission of Zika virus disease is possible.

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



AUGUST 2019

Biosimilars vs Generic Drugs



AUGUST 2019

Traditional generic



Chemicals can be copied quickly and inexpensively

Development time

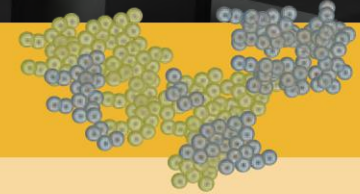
2-3 years

Development costs

\$2-5 million

Lower up-front investment means greater savings

Biosimilar



Complex biologics take longer and cost more to duplicate

Development time

> 8-10 years

Development costs

\$100 - \$200 million

Higher up-front investment means smaller margins

Traditional development costs: Health Affairs, 33, no.6 (2014):1048-1057. Regulatory and Cost Barriers are Likely to Limit Biosimilar Development and Expected Savings in the Near Future. Biosimilar development costs: Matrix Global Advisors. The Economic Viability of a U.S. Biosimilars Industry. Feb. 2015.



AUGUST 2019

QLED/OLED



AUGUST 2019

Context: New and Emerging Technology

QLED is a variation of LED/LCD, adding a quantum dot film to the LCD "sandwich."

OLED is "emissive," meaning the pixels emit their own light.

QLED, like LCD, is, in its current form, "transmissive" and relies on an LED backlight.

Quantum dots are tiny particles of between two and 10 nanometres in diameter. They're employed in displays due to their ability in conjunction with other materials to give off different colours according to their size.

The advantage of this is that they're capable of emitting brighter, more vibrant, and more diverse colors.





AUGUST 2019

GAGANYAAN-2/HELIUM MINING



AUGUST 2019

Context: India's Moon Mission

Why it took close to 30 days for Gaganyaan to reach Moon when NASA's Manned Moon Mission landed on Moon surface in 4 days?

- **Instead of going against earth's gravity (straight to moon), which requires a very powerful rocket and a lot of fuel, Chandrayaan-2 lunarcraft used earth's gravity assist to reach the Lunar Transfer Trajectory.**
- **Beresheet Mission-ISRAEL**

Helium-3 Mining- Why? Nuclear Fusion and Fission



AUGUST 2019

DISEASES & VACCINES



AUGUST 2019

DISEASES & VACCINES

Albendazole Tablets-Parasitic Worm

BPaL Regimen-TB (comprised of bedaquiline, pretomanid and linezolid)

Rotavirus-Diarrhea

Versavo (bevacizumab)-Cancer Drug (biosimilar of Roche's Avastin)

(DTG) Dolutegravir - WHO recommends dolutegravir as preferred **HIV treatment** option in all populations

MDR, XDR - CBNAAT (Cartridges Based Nucleic Acid Amplification Test) is used for early diagnosis of MDR-TB and TB in high risk population.

Zmapp, remdesivir, REGN-EB3 and mAb114 -**Trial drugs for Ebola**

Lokiarchaea- DNA analysis showed that the Lokiarchaea genome did have eukaryote-like genes, strongly bolstering the theory that eukaryotes evolved due to interactions between archaea and bacteria.





AUGUST 2019

PHAGE THERAPY



AUGUST 2019

Context: Phages are currently being used therapeutically to treat bacterial infections that do not respond to conventional antibiotics. (Anti-microbial Resistance)

Phage therapy or viral phage therapy is the therapeutic use of bacteriophages to treat pathogenic bacterial infections.

Bacteriophages, known as phages, are a form of viruses.

Phages attach to bacterial cells, and inject a viral genome into the cell.

The viral genome effectively replaces the bacterial genome, halting the bacterial infection.

Phages tend to be more successful than antibiotics where there is a biofilm covered by a polysaccharide layer, which antibiotics typically cannot penetrate.

Bacteriophages are much more specific than antibiotics.

They are typically harmless not only to the host organism but also to other beneficial bacteria, such as the gut flora, reducing the chances of opportunistic infections.

Superbugs that are immune to multiple types of drugs are becoming a concern with the more frequent use of antibiotics. Phages can target these dangerous microbes without harming human cells due to how specific they are.



PYQs-Theme Analysis

Q.) Consider the following statements:

1. Agricultural soils release nitrogen oxides into environment.
2. Cattle release ammonia into environment.
3. Poultry industry releases reactive nitrogen compounds into environment.

Which of the statements given above is/are correct?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) 2 only
- (d) 1, 2 and 3**



PYQs-Theme Analysis

Q.) In the context of which of the following do some scientists the use of cirrus cloud thinning technique and the injection of sulphate aerosol into stratosphere?

- a) Creating the artificial rains in some regions
- b) Reducing the frequency and intensity of tropical cyclones
- c) Reducing the adverse effects of solar wind on the Earth
- **d) Reducing the global warming**



PYQs-Theme Analysis

Q.) Why is there a great concern about the 'micro beads' that are released into environment?

- a) They are considered harmful to marine ecosystems.**
- b) They are considered to cause skin cancer in children
- c) They are small enough to be absorbed by crop plants in irrigated fields.
- d) They are often found to be used as food adulterants



PYQs-Theme Analysis

Q.) Consider the following statements:

1. The Environment Protection Act, 1986 empowers the Government of India to
2. State the requirement of public participation in the process of environmental protection and the procedure and manner in which it is sought
3. Lay down the standards for emission or discharge of environmental pollutants from various sources

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



PYQs-Theme Analysis

Biological Oxygen Demand (BOD) is a standard criterion for

- (a) Measuring oxygen levels in blood
 - (b) Computing oxygen levels in forest ecosystems
 - (c) Pollution assay in aquatic ecosystems**
 - (d) Assessing oxygen levels in high altitude regions
-



PYQs-Theme Analysis

With reference to the role of UN-Habitat in the United Nations programme working towards a better urban future, which of the statements is/are correct?

1. UN-Habitat has been mandated by the United Nations General Assembly to promote socially and environmentally sustainable towns and cities to provide adequate shelter for all.
2. Its partners are either governments or local urban authorities only.
3. UN-Habitat contributes to the overall objective of the United Nations system to reduce poverty and to promote access to safe drinking water and basic sanitation.

Select the correct answer using the code given below:

(a) 1, 2 and 3

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1 only



PYQs-Theme Analysis

Q. Consider the following statements:

1. Climate and Clean Air Coalition (CCAC) to Reduce Short Lived Climate Pollutants is a unique initiative of G20 group of countries.
2. The CCAC focuses on methane, black carbon and hydrofluorocarbons.

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



PYQs-Theme Analysis

According to the Wildlife (Protection) Act, 1972, which of the following animals cannot be hunted by any person except under some provisions provided by law?

1. Gharial
2. Indian Wild Ass
3. Wild Buffalo

Select the correct answer using the code given below:

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3



AUGUST 2019

ECO-SENSITIVE ZONE (ESZ)



AUGUST 2019

ECO-SENSITIVE ZONE (ESZ)/Eco-Fragile Areas

Context- **Supreme Court Order + Protests against ESZ creation.**

Interconnections

- **MOEF+ Environment Protection Act, 1986**
- **Area- 10km within NP + Wildlife Sanctuaries.**
- **Shock Absorber-transition zone from areas of high protection to areas involving lesser protection.**
- **Remember the Wildlife Sanctuaries or NP in news w.r.t ESZ**

Activities- allowed/Prohibited

Allowed/Regulated/Prohibited?





AUGUST 2019

**Convention on International Trade in
Endangered Species of Wild Fauna & Flora (CITES)**



AUGUST 2019

CITES-Washington Consensus

Context- 18th COP of CITES- Geneva (Where?)

Why important?- India requested to amend the listing of species.

Species- smooth-coated otter, small-clawed otter, Indian star tortoise, Tokay gecko, wedgefish and Indian rosewood (India wanted to de-list it from Appendix II but it wasn't approved)

Appendix I- Star tortoise, Asian small-clawed and smooth-coated otters

Appendix II- Wedgefish, Tokay Gecko (Giraffes included)

What is Dalbergia Sissoo??



Indian Star Tortoise

Geochelone elegans



Population Trend
Decreasing



CITES
Appendix
I



“The illegal trade in Indian star tortoises has skyrocketed. Back in 2004, one estimate figured about 10,000 to 20,000 were being taken illegally from the wild over the tortoises' entire range.

But in just a single rural village center in the southern Indian state of Andhra Pradesh, middlemen collected at least 55,000 Indian star tortoises poached from nearby smaller settlements in 2014 ”

TRADED
FOR :



PET
TRADE



TRADITIONAL
MEDICINE



ORNAMENTAL
CARAPACE

- quoted in an article on
nationalgeographic.com



Small-Clawed Otter (*Aonyx cinereus*)

VU

CITES
Appendix
I

"International and domestic trade in Small-clawed Otters poses serious criminal and conservation implications, alongside threats to animal welfare and local ecosystems"



39 GLOBAL SEIZURES
live otters were seized
destined to Japan, between
2016 and 2017



10 OTTER CAFES
displaying 32 Small-
clawed Otters in total
were found



74 IMPORTED
by Japan (89%)
between 2000–2016
were Small-clawed Otters

SOURCE : Otter Alert, A TRAFFIC Report by Tomomi Kitade and Yui Naruse

CITES
Appendix
I

Smooth Coated Otter (*Lutrogale perspicillata*)

VU

"Out of the four species found in Asia, the Small Clawed Otter and the Smooth Coated Otter are most frequently encountered in illegal trade"

-TRAFFIC Report: Illegal Otter Trade in Southeast Asia



Photos : Wikimedia Commons Icons : www.thenounproject.com



Wedgefishes (Rhinidae spp.)



Population Trend
DECREASING

“ Approximately **31 percent** of shark and ray species are recognised as threatened with extinction and an estimated **100 million** sharks are killed annually ”

- www.independent.co.uk

CITES
Appendix
II



TRADED FOR:



Shark Fin
Soup



Meat

“ Known as rhino rays because of their long snouts, wedgefishes are one of the most endangered marine group left in the ocean and are relentlessly targeted for their sought-after fins ”

- www.independent.co.uk



Tokay Gecko (*Gekko gekko*)

Previously unlisted, the Tokay Gecko has now been **included in Appendix II** of the CITES trade database. More than one million tokay geckos are estimated to be traded annually. Effective implementation of this newly adopted listing could help tokay geckos benefit from **increased monitoring and regulation of trade**.

-www.worldwildlife.org

CITES
Appendix
II



TRADED FOR :



Traditional
Medicine



Pet
Trade





Saiga Antelope-Appendix I-Critically Endangered



PYQs-Theme Analysis

Q. With reference to the International Union for Conservation of Nature and Natural Resources (IUCN) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which of the following statements is/are correct?

1. IUCN is an organ of the United Nations and CITES is an international agreement between governments
2. IUCN runs thousands of field projects around the world to better manage natural environments.
3. CITES is legally binding on the States that have joined it, but this Convention does not take the place of national laws.

Select the correct using the code given below.

-
- a) 1 only
 - b) 2 and 3 only
 - c) 1 and 3 only
 - d) 1, 2 and 3





AUGUST 2019

CONFUSING TERMS IN NEWS-UPSC's FAVORITE

Mesovelgia

Tardigrade

Gomphothere

Coprolites

Cnemaspis Anandani



AUGUST 2019

Mesovelia

New species of water treaders.

Insects can walk or run on surface of water.



AUGUST 2019

Tardigrade

Also known as water bear.

One among the toughest and most resilient creatures on Earth.

**Can withstand gamma radiation, lack of oxygen,
blast of solar winds and go without food
and water for over ten years.**



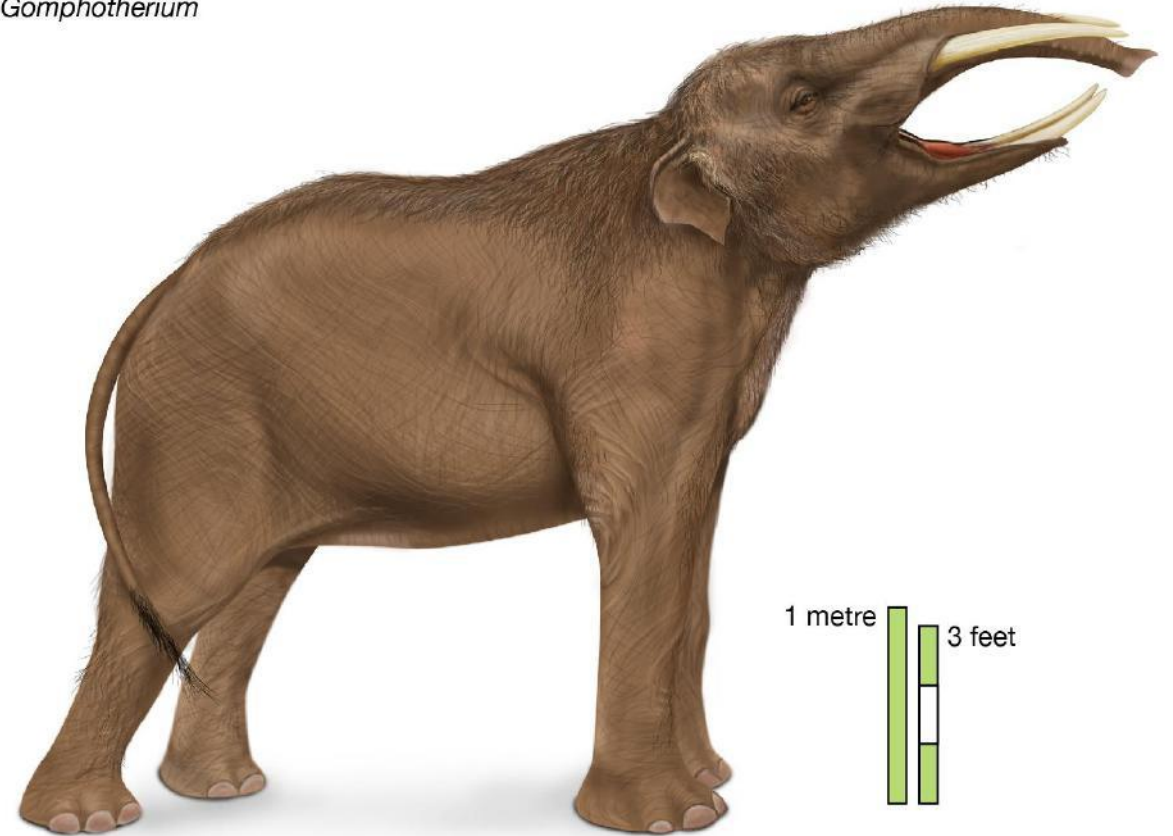
AUGUST 2019

Gomphotherere

The fossils found in Kutch, Gujarat.

Member of a line of extinct elephants

Gomphotherium



© 2013 Encyclopædia Britannica, Inc.

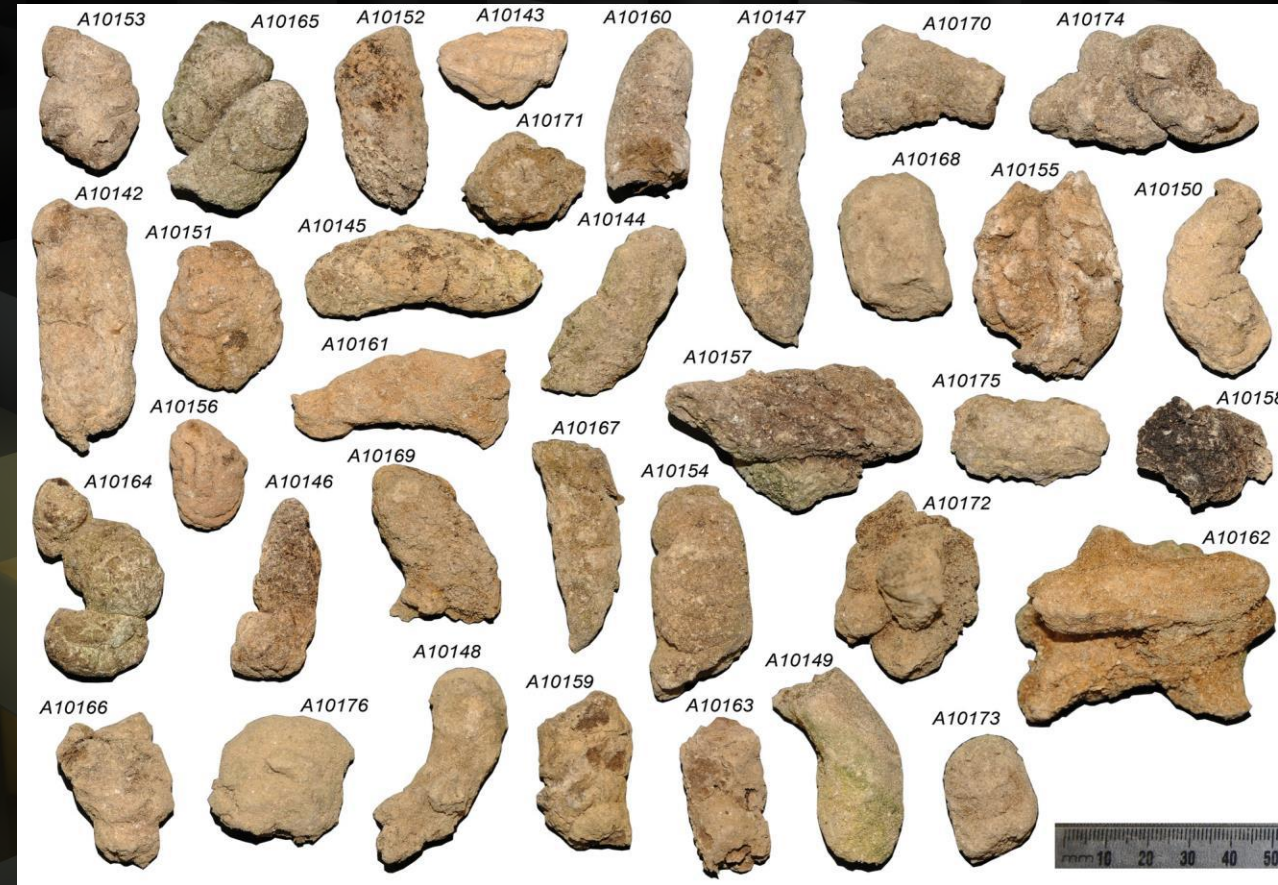


AUGUST 2019

Coprolites

Coprolites are fossilised feces/dung belonging to animals that lived millions of years ago.

Scientists have found the oldest parasite DNA in the Coprolite of a prehistoric Puma in Argentina.



AUGUST 2019

Cnemaspis Anandani

Species of Day Gecko found in Western Ghats

Named after Anandan Sethuraman, a conservationist.

Facing Extinction

Species of Western Ghats?

Nilgiri Biosphere Reserve?





AUGUST 2019

GROWTH-TELESCOPE



AUGUST 2019

GROWTH-TELESCOPE

- Global Relay of Observatories Watching Transients Happen
 - Transient events in the Universe
 - Indian Astronomical Observatory (IAO) at **Hanle in Ladakh**
 - First **robotic telescope** of India and the first one designed to observe dynamic or transient events in the universe.
 - Fully funded by the **Science and Engineering Research Board (SERB)**
-





AUGUST 2019

United Nations Industrial Development Organization (UNIDO)



AUGUST 2019

Context: The Mysuru City Corporation (MCC) is set to receive funding from the United Nations Industrial Development Organisation (UNIDO) for the **implementation of waste management projects** to reduce pollution and greenhouse gas emission.

**UNIDO's Sustainable Cities Integrated Approach Pilot in India (SCIAP).
Funded by GEF**

About UNIDO

- **Specialized Agency of UN**
- **1966**
- **Headquarter-Vienna, Austria**
- **SDG-9, which calls to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"**
- **Lima Declaration (Lima-Peru): Towards inclusive and sustainable industrial development**





AUGUST 2019

**State of Food Security and Nutrition in the World, 2019
Report**



AUGUST 2019

Context- Estimates on food insecurity, hunger and malnutrition at the global and regional levels.

- **Food and Agriculture Organization of the United Nations,**
- **the International Fund for Agricultural Development,**
- **UNICEF,**
- **the World Food Programme and**
- **the World Health Organization.**

Focus on

- **Sustainable Development Goal- 2, Zero Hunger by 2030.**
- **Reality- More than 820 million people in the world were still hungry in 2018**
- **Report also focuses on impacts of economic slowdowns and downturns on food security and nutrition.**
- **Confirms a rise in world hunger for a third year in a row**



AUGUST 2019

Mekong Ganga Cooperation



AUGUST 2019

Context: 10th Mekong Ganga Cooperation Ministerial Meeting (Bangkok)

CLMV, Thailand and India.

20th Anniversary of MGC in 2020. (Formed in 2000)

Mekong River- Tibetan Plateau, China, CLMV and Thailand.

The four areas of cooperation are *tourism, culture, education, and transportation.*





AUGUST 2019

Invasive Alien Species



AUGUST 2019

Context: Major Invasive Species Attacks in India

Types- Plant, Animals, Any living organism, fungus, fish etc. (not native to the region)

Name any invasive species?

- **Quarantine Centres**
 - **Phytosanitary Certificate**
 - **Methyl Bromide (gas fumigant for soil-borne diseases and pests)**
-



Silent intruders

India has witnessed at least 10 pest and weed attacks in the past 15 years



2019
Onion weed
(*Asphodelus fistulosus*)

Africa, South Europe and West Asia
Onion
Maharashtra



2016
The rugose spiraling whitefly

Central America
Banana, coconut, mango and jackfruit
Kerala



2014
Tomato leafminer
(*Tuta absoluta*)

South America
Tomato
Andhra Pradesh, Chhattisgarh, Karnataka, Tamil Nadu



2012
The papaya mealy bug
(*Paracoccus marginatus*)

North America
Papaya
Assam, West Bengal, Rajasthan, Karnataka, Kerala, Tamil Nadu

- Pest / weed name
- Country / region of origin
- Crop impacted
- State/region impacted in India

Source: Media reports

2019

Double gee (*Emex australis* Steinh)
Southern Africa
Wheat
Haryana



2018

The fall armyworm
(*Spodoptera frugiperda*)
North and South America
Maize
Karnataka



2014

Coffee berry borer
(*Hypothenemus hampei*)
North America
Coffee
Kerala, Karnataka, Tamil Nadu



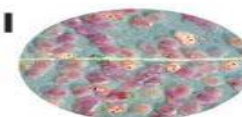
2014

Eriophyid mite
(*Aceria guerreronis*)
South America
Coconut
South India, West Bengal, Odisha, Gujarat, Maharashtra



2009

The eucalyptus gall wasp (*Leptocybe invasa*)
Europe
Eucalyptus
Karnataka



2004

The cotton mealy bug (*Phenacoccus solenopsis*)
North America
Cotton
Punjab, Haryana, Maharashtra, Tamil Nadu, Karnataka, Madhya Pradesh, West Bengal, Gujarat



AUGUST 2019

Perfluoroalkyl Acids (PFAAs)





AUGUST 2019

Context: Glacial water from the Himalayas are found to have traces of toxic chemicals like perfluoroalkyl acids (PFAAs) that are known to cause severe health complications.

- Stored in Glaciers-Long life
 - Non-biodegradable
 - Why? South Asian Countries-Most Polluted Region in the World.
 - **Bio-accumulation in Rivers and Lakes**
-



AUGUST 2019

Methylmercury



AUGUST 2019

Context: Contamination and Toxicity of Methylmercury in Fishes. Effects of Climate Change, Ocean Warming+Bioaccumulation

Bacteria react with mercury in water, soil, or plants to form methylmercury.

Natural Sources of mercury released to the atmosphere

- Volcanoes
- Forest fires
- Volatilization from the Ocean
- Weathering of mercury bearing rocks

Anthropogenic Sources of mercury

- Burning of wastes containing inorganic mercury.
- Burning of fossil fuels, particularly coal.
- **Convention related to Methyl Mercury?**





AUGUST 2019

Protected Cultivation



AUGUST 2019

Greenhouse Cultivation and Poly House Cultivation – Difference



AUGUST 2019

Hydroponics- Growing plants using mineral nutrient solutions, in water, **without soil.**



AUGUST 2019

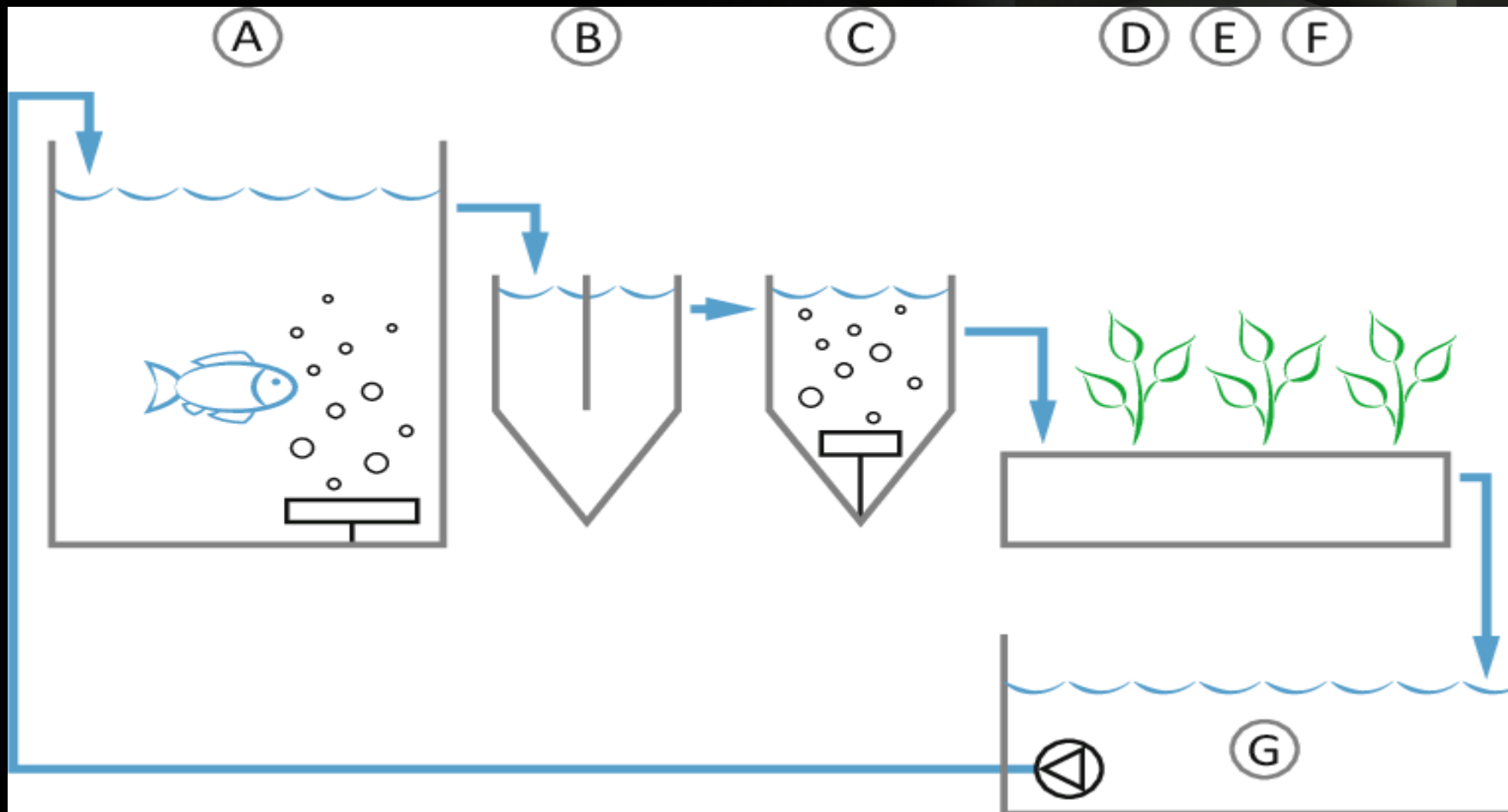
Hydroponics

- More yield -**vertical farming**
 - Synthetic fertilisers are used in hydroponics for providing nutrients to plants
 - Cropping Cycle is reduced-No Long Roots for Nutrients absorption.
 - **10%** of the water **that soil-based agriculture requires**
 - **Logistic costs is drastically reduced.**
 - **Nutritional Value increases**
 - **Supports organic farming-Better Techniques for agri.**
-
- **Not for traditional farmers-capital intensive**
 - **Needs proper technical awareness**
 -



AUGUST 2019

The method combines aquaculture cultivating fish and other aquatic animals in tanks with organic inputs – with hydroponics, where plants are cultivated in water-**AQUAPONICS**



AUGUST 2019

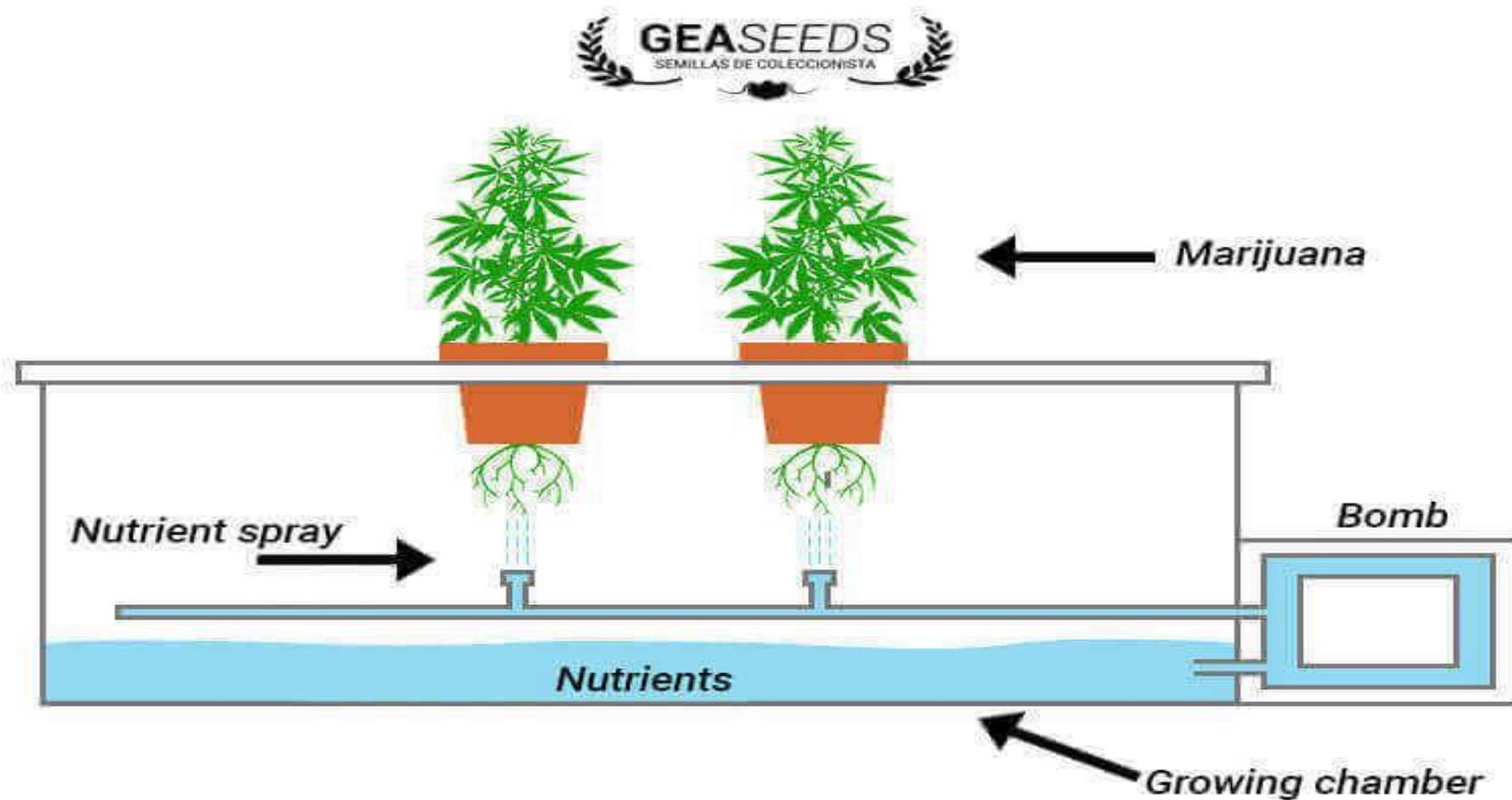
Aquaponics

- Synthetic fertilisers are used in hydroponics for providing nutrients to plants whereas no fertilizer is used in aquaponics.
- **Fish excretions** provide nutrients for the plants



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Aeroponics- Growing plants in **mist environment without the use of soil medium.**



AUGUST 2019

Aeroponics

- Alternative to water intensive hydroponic systems
 - Plant-to-plant contact is reduced- disease transmission is less. Better oxygen availability for plants
 - Development of healthy root systems- Improves uptake of minerals by plants and
 - Plants in a true aeroponic conditions have 100% access to the CO₂ concentrations for photosynthesis. This leads to a multi-fold increase in plant metabolism, which in turn results in a vast increase in production.
 - Any species of plants can be grown in a true aeroponic system because the microenvironment of an aeroponic can be finely controlled.
 - Aeroponically grown plants have high dry weight biomass (essential minerals).
-
- According to NASA, aeroponically grown plants require $\frac{1}{4}$ the nutrient input compared to hydroponics.
 - Unlike hydroponically grown plants, aeroponically grown plants will not suffer transplant shock when transplanted to soil.



AUGUST 2019

Geoponic- Growing plants in **normal soil**.

Geoponic - Biologically Based Growth

- Microbial activity in the soil act as plants gut breaking down naturally occurring minerals to be absorbed through roots
- Involves Soil Science



Greening
LIBRARIES



AUGUST 2019

THANK YOU

