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A. GS1 Related

Category: ART and CULTURE

1. Jaipur gets UNESCO World Heritage tag

What's in the news?

- Jaipur, celebrated for its grid plan-based architecture and buildings of pink façades, entered the list of the UNESCO World Heritage Sites.
- It was among the seven sites worldwide to have made it to the list.
- The decision was taken by the World Heritage Committee at the UNESCO's 43rd

session at Baku, Azerbaijan.

A Deeper Insight:

The Criteria for Selection:

- To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria.
- These criteria are explained in the Operational Guidelines for the Implementation of the World Heritage Convention which, besides the text of the Convention, is the main working tool on World Heritage. The criteria are regularly revised by the Committee to reflect the evolution of the World Heritage concept itself.
- Until the end of 2004, World Heritage sites were selected on the basis of six cultural and four natural criteria. With the adoption of the revised Operational Guidelines for the Implementation of the World Heritage Convention, only one set of ten criteria exists.

Selection criteria:

- to represent a masterpiece of human creative genius;
- to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);
- to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

- to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

B. GS2 Related

Category: POLITY AND GOVERNANCE

1. SC pulls up Kerala for denying relief to endosulfan victims

A Brief Look at History:

A Look at the Endosulfan Disaster in Kerala:

- The endosulfan tragedy happened in Kasaragod district of Kerala in India.
- It is considered by many experts in the field of pesticide toxicity as one of the world's worst pesticide disasters.
- The Plantation Corporation of Kerala (PCK), a public sector undertaking under the State Government, which owns three cashew plantations covering 4600 hectares in Kasargod, sprayed endosulfan aerially in these plantations for 24 years (1976 to 2000), three times a year.
- These uninterrupted spraying in spite of several warnings about its disastrous impact on health and environment resulted in several chronic, critical and life-threatening ailments in the areas surrounding the plantations.
- Around twelve villages had been severely affected. In these villages there is a very high concentration of chronic health complications like Mental, Physical and Behavioral disorders, Sensory loss, Neurological ailments, Cardiovascular diseases, Congenital Anomalies, Dermatological and Musculoskeletal disorders etc.

A Note on Persistent Organic Pollutants:

- Persistent organic pollutants (POPs) are organic compounds that are resistant to environmental degradation.
- It is due to this, they have been observed to persist in the environment, and are capable of long-range transport, bioaccumulation in human and animal tissue, biomagnification in food chains, and to have potential significant impacts on human health and the environment.
- In 1995, the United Nations Environment Programme Governing Council (GC) decided to begin investigating POPs, initially beginning with a short list of the following twelve

POPs, known as the 'dirty dozen'. DDT was one among them.

What's in the news?

- The Honourable Supreme Court has ordered the Kerala government to pay ₹5 lakh compensation to four minors affected by the toxic pesticide endosulfan in the State within two months.
- If the victims are not paid the money within the period, they are at liberty to revive the contempt action against the Kerala government, the court said.
- The order came on a contempt petition filed by four children through their natural guardians. Represented by advocates, the children had challenged the non-disbursement of ₹5 lakh by the Kerala government to endosulfan victims in violation of an order passed by the Supreme Court on January 10, 2017.

A Look at the lives affected:

- Thousands of children [have] already lost their lives due to the non-availability of proper medical care. The economic backwardness of the area prevents persons like the petitioners from giving proper care to their children on time.
- The victims said even a list prepared by the State government of victims entitled to ₹5 lakh compensation has around 6,000 people.
- The petition said unnamed, forgotten victims continue to live in dire straits despite the Supreme Court order of January 2017.
- It is important to note that the Supreme Court order specifically directed the State government to release the entire undisbursed payment of compensation, quantified as ₹5 lakh each, to all the affected persons.

Claim made by the State of Kerala:

- In January, 2019, the Kerala government had claimed it earmarked over ₹180 crore for payment of compensation to victims, some of whom were terminally-ill from the effects of the pesticide, which was aerially sprayed on cashew plantations adjoining habitations where the victims were located.
- Responding to the contempt petition by the four children, the State, said the four victims were classified in the 'Other' category list and were not eligible for ₹5 lakh compensation.
- A Bench of Justices D.Y. Chandrachud and Indira Banerjee in early July, 2019, however, found no reason and justification for the government of Kerala to categorise these four individuals in the 'Other' category and to deny them payment of compensation.

Category: INTERNATIONAL RELATIONS

1. The importance of being Thimpu

What's in the news?

- India-Bhutan relations received a big boost with the allocation of the lion's share of the foreign affairs outlay in the Union Budget presented in Parliament recently.
- That the budgetary allocation has been hiked successively over two years shows that following the 2017 Doklam crisis, **India is according highest priority to the Himalayan country.**

Allocations made to Bhutan:

- Bhutan received ₹2,802 crore, out of the total allocations for foreign affairs commitments.
- This move has indicated that India is going to firm up its development commitments with the Himalayan country in the coming year which will also be crucial for ties with Beijing, with a new bilateral India-China summit being planned.

Visit to Bhutan on the anvil for PM Modi:

- Ties with Bhutan will receive the highest level of attention with Prime Minister Narendra Modi's visit which is expected shortly.
- Though the External Affairs Ministry is yet to announce the date, it is understood that Bhutan will be the third South Asian destination of the Prime Minister after his re-election following his visit to the Maldives and Sri Lanka.
- Bhutan's premier Lotay Tshering was one of the heads of government at the swearing-in of Mr. Modi for the second term.
- It is expected that top-level projects such as the **Manghdechhu hydropower project** and a **multi-speciality hospital** backed by India will be on the agenda during Mr. Modi's visit.

A Note on the Manghdechhu hydropower project:

- The Mangdechhu hydroelectric project is a 720MW run-of-river power plant built on the Mangdechhu River in Trongsa Dzongkhag District of central Bhutan.
- Mangdechhu is one of the ten hydroelectric projects planned under the Royal Government of Bhutan's initiative to generate 10,000MW hydropower by 2020 with support from the Indian Government. An agreement was signed between the two governments for the execution of Mangdechhu HEPP at a cost of Rs28.96bn ($434m) in April 2010.
- The Mangdechhu project is in its final stages and it is expected that the visit of the

Indian PM could coincide with the inauguration of the high-capacity power project.

- Most of the electricity generated by the Mangdechhu hydropower project will meet the energy requirements of Bhutan and the surplus electricity will be exported to India.
- India and Bhutan signed a protocol in April 2019, formalising the tariff at Rs2.4/unit for a period of 35 years. The tariff will be increased by 10% every five years until the loan is repaid and 5% thereafter.
- India's state-owned National Hydroelectric Power Corporation (NHPC) acted as the design and engineering consultant for the Mangdechhu hydropower project.
- Jaypee Group subsidiary Jaiprakash Associates was awarded the contract for the construction of the dam, diversion tunnels, underground powerhouse, shafts and the intake structures for the Mangdechhu project.

A Note on India-Bhutan Space Cooperation:

- Another high-profile project between the two countries is the **South Asia Satellite programme.**
- It is important to note that India is setting up a satellite tracking and data reception centre in the Himalayan state of Bhutan that will also strategically serve to counter a similar Chinese facility in the region.
-
- The Indian Space Research Organisation's ground station in Bhutan is likely to double up as **a strategic asset** for the country, given its location between India and China.
- China has established an advanced satellite tracking centre and astronomical observatory at Ngari in Tibet Autonomous Region, about 125 km away from the Line of Actual Control, which serves as the de-facto border between India and China.
- The facility in Tibet is so advanced that apart from tracking Indian satellites, it can also "blind" them.
- Although ISRO's ground station in Bhutan is intended to help the Himalayan state take advantage of the South Asia Satellite, it is also India's way of counterbalancing the Chinese station in Tibet.
- This strategy is significant in the backdrop of the Doklam crisis, when the Chinese tried to construct a road at a tri-junction between India, Bhutan and China.
- Bhutan stood firmly with India during the 72-day face-off between the Indian army and the Chinese People's Liberation Army at Doklam in western Bhutan in June-August, 2017.

Leveraging the South Asia Satellite:

- It is important to note that ISRO had launched the South Asia Satellite on May 5, 2017.
- India bore the entire expenses for building and launching the satellite.
- PM Modi had in 2014 mooted the idea of having a satellite for all the members of the

South Asian Association for Regional Cooperation (SAARC) so that India could share the benefits of its advances in space technology with its neighbours in South Asia. Pakistan stayed away from it although all other SAARC nations joined India in the project.

- Both India and Bhutan officially maintain that the ISRO ground station will help Bhutan reap the benefits of the South Asia Satellite — particularly in the fields of weather information, tele-medicine and disaster relief.

Concluding Remarks:

- The highlights of Modi's Bhutan visit will be the inauguration of the satellite tracking and data reception centre.
- Earlier in June, 2019, Modi had inaugurated a new network of radar systems that New Delhi recently installed in the islands of Maldives the Indian Ocean archipelago.
- The system gave India more eyes to keep watch on shipping in the region, apart from serving the stated purpose of helping the Maldives safeguard its sovereignty in its Exclusive Economic Zone (EEZ).
- Similarly, this ground station in Bhutan is going to be the **second strategic asset** inaugurated by Modi in the neighborhood.

2. China cites India's role in reviving economic corridor

What's in the news?

- Chinese President Xi Jinping flagged off recently the revival of the Bangladesh-China-India-Myanmar Economic Corridor (BCIM-EC). This was done during talks with Prime Minister Narendra Modi in Kyrgyzstan's capital of Bishkek.
- Prime Minister of Bangladesh Sheikh Hasina as well recently had talks with Chinese President Xi Jinping to accelerate the project with New Delhi's support.
- Sheikh Hasina pledged to promote the construction of the BCIM Economic Corridor.
- Recently, Chinese Prime Minister Li Keqiang advocated that Beijing and Dhaka should work together to build the BCIM- EC, in a bid to connect the market covering nearly 3 billion people.

Reflecting on the SCO meet with Modi:

- The revival of Chinese interest in the BCIM-EC in coordination with India was evident when Mr. Xi singled out the project as an example of expanding the India-China ties following the recent talks with Mr. Modi on the sidelines of the Shanghai Cooperation Organisation (SCO) summit in Bishkek.
- In tune with China's intent to engage with India to spur the BCIM-EC, President Xi and

Prime Minister Hasina acknowledged that **the initiative would have to be revived working together with India**.

- After the Wuhan summit in 2018, China has been advocating **'China-India Plus'** cooperation, aimed at adopting a joint approach towards some of the major issues in the region, including the Rohingya refugee crisis and possible initiatives in Nepal, Afghanistan and Iran.
- During talks with Ms. Hasina, the Chinese side appeared to demonstrate an urgency to tackle the Rohingya crisis on Dhaka's request.

Financing of projects:

- China's decision to adopt a consultative approach with its BRI partners, including on the financing of specific projects, as announced during the recent Belt and Road Forum (BRF), echoed in Ms. Hasina's talks with the Chinese leadership.
- It is believed that Ms. Hasina requested Mr. Xi to ease the terms and condition of loan agreements, which were signed during his visit to Dhaka in 2016.

Dhaka's concerns:

- Hasina also sought Chinese investments, with buyback arrangements, in the 100 economic zones that were slated to be opened up in the country, along with addressing the issue of trade imbalance between Bangladesh and China, which is also the world's second largest economy.
- Xi promised to take concrete steps to assuage Dhaka's concerns, echoing his remarks at the BRF that the financial model for funding BRI projects had been revamped, countering criticism that its mega-connectivity undertaking was opening **debt traps for enhancing its geopolitical influence.**
- The Chinese President also sought Bangladesh's support for building a digital silk road.

C. GS3 Related

Category: INDIAN ECONOMY

1. Aadhaar can be used for cash and other dealings

What's in the news?

- The Aadhaar number can now be quoted for cash transactions of more than ₹50,000

and for all other purposes where traditionally the income tax PAN number was mandatory,
- Banks will make upgrades to allow acceptance of Aadhaar.
- This follows the Budget allowing interchange of PAN and Aadhaar for filing taxes.

2. Nirav, aides told to pay over ₹7,200 cr to banks

Background:

Debt Recovery Tribunal

- Debt Recovery Tribunals were created to facilitate the speedy recovery of debt payable to banks and other financial institutions by their customers.
- DRTs was set up after the passing of Recovery of Debts due to Banks and Financial Institutions Act (RDBBFI), 1993.
- A person or entity aggrieved by orders of the DRT can appeal against its orders to Debt Recovery Appellate Tribunal (DRAT).

Importance of DRT

- The main objective and role of DRT is the recovery of funds from borrowers which is payable to banks and financial institutions.
- The Tribunals power is limited to settle cases regarding the restoration of the unpaid amount from NPAs as declared by the banks under the RBI guidelines.
- The Tribunal has all the powers vested with the District Court.
- The Tribunal also has a Recovery officer who guides in executing the recovery Certificates as passed by the Presiding Officers.

Criteria for NPA:

- In terms of Reserve Bank of India (RBI)'s master circular released in 2015 on Prudential norms on Income Recognition, Asset Classification and Provisioning pertaining to Advances, an asset becomes non-performing when it ceases to generate income for the bank.
- As per the circular, a non-performing asset (NPA) is a loan or an advance where—

1. in respect of a term loan, interest and/or instalments of the principal remain overdue for a period of more than 90 days;
2. in respect of an Overdraft/Cash Credit, the account remains 'out of order';
3. in respect of bills purchased and discounted, the bill remains overdue for a period of more than 90 days;
4. in respect of agricultural loans, the instalment of principal or interest thereon

remains overdue for—

(i) two crop seasons for short-duration crops, and

(ii) for one crop season for long-duration crops.

1. the amount of liquidity facility remains outstanding for more than 90 days, in respect of a securitisation transaction;
2. in respect of derivative transactions, the overdue receivables representing positive mark-to-market value of a derivative contract, if these remain unpaid for a period of 90 days from the specified due date for payment.

Recently, **the RBI has informed that the criteria for classifying an account as NPA have not been amended or changed during the past five years.**

What's in the news?

- Recently, the Pune Bench of the Debt Recovery Tribunal (DRT) directed diamond merchant Nirav Modi and his aides to pay over ₹7,200 crore with interest to the Punjab National Bank (PNB) and others.
- In both the suits, the judge granted liberty to applicants to publish the names of the defendants as per rule 15 (A) of the Debt Recovery Tribunal (Procedure) Rules.

Category: SCIENCE AND TECHNOLOGY

1. Mould grows in space

What's in the news?

- New research has found that mould can survive incredibly high doses of ionising radiation.
- The spores of two species of mould – **Aspergillus and Penicillium** – seem to have survived in the International Space Station despite being subjected to X-ray exposure 500 times as strong as what would kill a human being according to the American Geophysical Union.
- The International Space Station may be climate and humidity controlled, but it is still, indeed, an enclosed box - and there's enough damp that mould keeps growing on the walls.
- Aspergillus and Pennicillium are among the two most common space station invaders.
- They can also cause some pretty nasty respiratory infections, when fungal filaments

are breathed in and lodge themselves in the airways.

2. Satellite finds tiny world

What's in the news?

- The Transiting Exoplanet Survey Satellite (TESS) launched by NASA in 2018 has discovered an exoplanet orbiting a nearby star.
- It is the smallest exoplanet discovered by it so far and has two neighbours.
- Published in The Astronomical Journal, this discovery was a challenge both as engineering and scientific demands go.
- **This exoplanet is about 80% the size of the Earth and 10% smaller than the previous smallest world discovered.**

Brief Note on The Transiting Exoplanet Survey Satellite (TESS):

- The Transiting Exoplanet Survey Satellite (TESS) is the next step in the search for planets outside of our solar system, including those that could support life.
- The mission will find exoplanets that periodically block part of the light from their host stars, events called transits.
- TESS will survey 200,000 of the brightest stars near the sun to search for transiting exoplanets. TESS was launched aboard a SpaceX Falcon 9 rocket.
- TESS scientists expect the mission will catalog thousands of planet candidates and vastly increase the current number of known exoplanets.
- Of these, approximately 300 are expected to be Earth-sized and super-Earth-sized exoplanets, which are worlds no larger than twice the size of Earth.
- TESS will find the most promising exoplanets orbiting our nearest and brightest stars, giving future researchers a rich set of new targets for more comprehensive follow-up studies.

Taking a Look at the Transit Method:

- The transit method of detecting exoplanets looks for dips in the visible light of stars, and requires that planets cross in front of stars along our line of sight to them.
- Repetitive, periodic dips can reveal a planet or planets orbiting a star.
- Transit photometry, which looks at how much light an object puts out at any given time, can tell researchers a lot about a planet.
- Based on how much of a dip in light a planet causes in its star, one can determine that planet's size. Looking at how long it takes a planet to orbit its star, scientists are able to determine the shape of the planet's orbit and how long it takes the planet to circle its sun.

- TESS will create a catalog of thousands of exoplanet candidates using this transit photometry method.
- After this list has been compiled, the TESS mission will conduct ground-based follow-up observations to confirm that the exoplanets candidates are true exoplanets and not false positives.
- These ground-based telescopes will collaborate with other ground-based telescopes to measure the masses of the planets.
- Using the known planet size, orbit and mass, TESS and ground-based follow-up will be able to determine the planets' compositions.
- This will reveal whether the planets are rocky (like Earth), gas giants (like Jupiter) or something even more unusual.

3. University of Hyderabad's inhibitor increases effectiveness of malaria drugs

What's in the news?

- Researchers from the University of Hyderabad have identified a small inhibitor that blocks an enzyme (Rad51) that plays a crucial role in repairing DNA damage in the malaria-causing parasite, **Plasmodium falciparum.**
- Plasmodium falciparum is a protozoan parasite that causes malaria.
- Both strands of the malaria parasite DNA get broken naturally. When DNA repair is prevented, it can lead to the accumulation of several double-strand breaks causing death of the parasites.
- Also, certain anti-malaria drugs such as artemisinin are designed to kill the parasites by causing such breaks in the DNA.
- **So when the inhibitor is used along with such drugs, the effectiveness of the drugs increases drastically in both drug-sensitive and drug-resistant malaria.**
- It is important to note that plenty of DNA double-strand breaks occur naturally in malaria parasites due to errors during replication.
- Also, when the parasites infect the red blood cells, free radicals are generated (during haemoglobin detoxification). The free radicals produce numerous double-strand breaks.
- In an earlier, the researchers found that the parasites use a particular mechanism — homologous recombination — to repair DNA double-strand breaks. In the present study, they demonstrated that the inhibitor targets and prevents the Rad51 enzyme from functioning.
- It is important to note that the **Rad51 enzyme is essential for the**

homologous recombination repair mechanism.

Double-strand breaks:

- The researchers created genome-wide double-strand breaks using a chemical. And they found that in the presence of the inhibitor, the parasites were unable to repair the break, leading to death causing death. The inhibitor blocks DNA repair in both drug-sensitive and drug-resistant malaria parasites.
- It is important to note that **Artemisinin drug used for treating malaria is designed to generate more double-strand breaks.**
- Similarly, chloroquine is also thought to produce more double-strand breaks by increasing the generation of free radicals inside red blood cells.
- When the inhibitor is used together with the drugs, the effect is pronounced leading to sharp reduction in parasite load.
- **The inhibitor has a synergistic effect and so less concentration of the drugs is sufficient to kill the parasites.**

Concluding Remarks:

- In the case of drug-sensitive malaria parasites, the effectiveness of artemisinin to kill the parasites increases sharply when used together with the inhibitor.
- The synergistic effect is so pronounced that a 15-fold less concentration of artemisinin is sufficient to kill 50% of parasites.
- Compared with artemisinin, the synergistic effect of the inhibitor and chloroquine in killing the parasites is relatively less -- there is an 8-fold reduction in drug concentration to kill 50% of the parasites.
- In the case of drug-resistant parasites, when the inhibitor is used along with chloroquine, 6.48-fold less concentration of the drug is sufficient kill 50% of parasites, while it is only 4.6-fold reduction when the inhibitor is used together with artemisinin.
- It is important to note that reducing the concentration of a drug used for treating a disease is desirable. So achieving several-fold reduction in the concentration of the drug to kill the parasites in the presence of the inhibitor, is an indication of the fact that the researchers have enhanced the effectiveness of the drug.
- Lastly, there is increasing prevalence of malaria parasites that are resistant to artemisinin, a first-line drug. So increasing the effectiveness of the drug becomes important.

D. GS4 Related

Nothing here for today!!!

E. Editorials

Category: ENVIRONMENT AND ECOLOGY

1. Is seawater the ultimate answer?

What's in the news?

- With warnings from India's top policy-makers and reports of major cities in India struggling to stave off a water crisis, there's talk about exploring technologies to harness fresh water.
- Experts point out that the one idea that's been around for a while is **desalination**, or obtaining freshwater from salt water.
- It is important to note that desalination technology is not an esoteric idea — the city of Chennai already uses desalinated water. However, it only has a limited application, given the operation costs.

Editorial Analysis:

Taking a look at what desalination technology is:

- To convert salt water into freshwater, the most prevalent technology in the world is reverse osmosis (RO).
- A plant pumps in salty or brackish water, filters separate the salt from the water, and the salty water is returned to the sea. Fresh water is sent to households.
- RO desalination came about in the late 1950s. While the principle is simple, engineering such plants has to factor in various constraints, for instance, salt levels in the source water that is to be treated, the energy required for the treatment and disposing of the salt back into the sea.
- Osmosis involves 'a solvent (such as water) naturally moving from an area of low solute concentration, through a membrane, to an area of high solute concentration.
- **A reverse osmosis system applies an external pressure to reverse the natural flow of solvent** and so seawater or brackish water is pressurised against one surface of the membrane, causing salt-depleted water to move across the membrane, **releasing clean water from the low-pressure side.**
- Seawater has Total Dissolved Solids (TDS) — a measure of salinity — close to 35,000 parts per million (ppm), or equivalent to 35 g of salt per one litre/kg of water.
- **An effective network of RO plants reduce this down to about 200-500 ppm.**

- There are about 18,000 desalination plants in the world across 150 countries and nearly half of Israel's water is sourced through desalination.

How popular is it in India?

- Years of water crises in Chennai saw the government set up two desalination plants between 2010 and 2013.
- These were at Minjur, around 30 km north of Chennai, in 2010, and Nemmeli, 50 km south of Chennai, in 2013. Each supplies 100 million litres a day (MLD).
- Taken together, they meet little under a fourth of the city's water requirement of 830 MLD.
- As a matter of fact, buoyed by the success of these plants, Chennai's water authorities are planning to install two more plants with capacities of 150 MLD (to be operational by 2021) and 400 MLD, at a cost of around ₹1,260 crore (funded by the German agency, KfW) and ₹4,000 crore (funded by the Japan International Cooperation Agency), respectively.
- In November 2018, Gujarat Chief Minister, Vijay Rupani, announced plans of setting up a 100 MLD RO plant at the Jodiya coast in Jamnagar district.
- This would go a long way in 'solving' the water availability problems in the drought-prone Saurashtra region.
- Other plants of a similar size are expected to come up in Dwarka, Kutch, Dahej, Somnath, Bhavnagar and Pipavav, which are all coastal places in Gujarat.
- **There are also a slew of desalination plants that cater to industrial purposes.**
- However, for now, India's real-world experience with desalination plants is restricted to Chennai.

What are the problems with RO plants?

- Because RO plants convert seawater to fresh water, the major environmental challenge they pose is the deposition of brine (highly concentrated salt water) along the shores.
- Ever since the Chennai plants have started to function, fishermen have complained that the brine being deposited along the seashore is triggering changes along the coastline and **reducing the availability of prawn, sardine and mackerel.**
- Environmentalists second this saying that hyper salinity along the shore affects plankton, which is the main food for several of these fish species.
- Moreover, the high pressure motors needed to draw in the seawater end up sucking in small fish and life forms, thereby crushing and killing them — again a loss of marine resource.
- Another unexpected problem **was that the construction of the RO plants required troves of groundwater.**

- This was freshwater that was sucked out and has since been replaced by salt water, rendering it unfit for the residents around the desalination plants.
- On an average, it costs about ₹900 crore to build a 100 MLD-plant and, as the Chennai experience has shown, about five years for a plant to be set up.
- To remove the salt required, there has to be a source of electricity, either a power plant or a diesel or battery source.
- Estimates have put this at about 4 units of electricity per 1,000 litres of water. **Therefore, each of the Chennai plants needs about 400,000 units of electricity. It is estimated that it cost ₹3 to produce 100 litres of potable water.**

Is RO water healthy?

- In the early days of RO technology, there were concerns that desalinated water was shorn of vital minerals such as calcium, magnesium, zinc, sodium, potassium and carbonates.
- They are collectively referred to as TDS.
- Higher quantities of these salts in desalination plants tend to corrode the membranes and filtration system in these plants.
- So ideally, a treatment plant would try to keep the TDS as low as possible.
- Highly desalinated water has a TDS of less than 50 milligrams per litre, is pure, but does not taste like water. Anything from 100 mg/l to 600 mg/l is considered as good quality potable water.
- It is important to note that **most RO plants, including the ones in Chennai, put the water through a 'post-treatment' process whereby salts are added to make TDS around 300 mg/l.** Several of the home-RO systems that are common in affluent Indian homes, too employ post-treatment and add salts to water.

Are there technological alternatives?

- The alternative desalination technology used is thermal energy sourced from the ocean. **There is a low-temperature thermal desalination (LTTD) technique**.
- In essence, this technique works on the principle that water in the ocean 1,000 or 2,000 feet below is about 4º C to 8º C colder than surface water.
- So, salty surface water is collected in a tank and subject to high pressure (via an external power source). This pressured water vapourises and this is trapped in tubes or a chamber.
- Cold water plumbed from the ocean depths is passed over these tubes and the vapour condenses into fresh water and the resulting salt diverted away.

A Deeper Understanding of LTTD:

- Low Temperature Thermal Desalination (LTTD) is one process that uses the availability of a temperature gradient between two water bodies or flows to evaporate the warmer water at low pressure and condense the resultant vapour with the colder water to obtain freshwater.
- While an ocean, with its temperature variation across its depth, presents one such scenario of two water bodies, a coast based thermal power plant discharging huge amounts of condenser reject water into the nearby ocean represents an alternate scenario.
- The simplicity of the LTTD process also enables to control the quality of product water in order to provide either good quality drinking water or boiler grade water as the situation warrants.
- The main components that are required for LTTD plant are the evaporation chamber, the condenser, pumps and pipelines to draw warm and cold water, and a vacuum pump to maintain the plant at sub-atmospheric pressures.
- One of the advantages of the process is that it can be implemented even with a low temperature gradient of about 8°-10°C between the two water bodies.

Looking at other technologies:

- The National Institute of Ocean Technology (NIOT), a research organisation based in Chennai, has been working on this technology for decades. In 2005, it set up a 100,000 litre-a-day plant in Kavaratti, Lakshwadeep islands and this has been providing water to about 10,000 residents.
- Other than the plant at Kavaratti, there are plants of similar capacity proposed at Minicoy and Agatti islands. There are also 1.5 lakh litres a day plants proposed at Amini, Androth, Chetlat, Kadamat, Kalpeni and Kiltan islands.
- However, the most ambitious research project is a 10 million litre a day plant that is proposed to be built in the deep ocean, 50 kilometres away from the Chennai coast. This exploits an approach called Ocean Thermal Energy Conversion.
- While the LTTD technique draws power from diesel sets, this massive new plant will draw power from the vapour generated as a part of the desalination process.
- This vapour will run a turbine and thereby will be independent of an external power source.
- **While great in theory, there is no guarantee it will work commercially.**
- For one, this ocean-based plant requires a pipe that needs to travel 50 kilometres underground in the sea before it reaches the mainland.
- The NIOT has in the past had significant problems in managing such a pipe.
- Then, RO is commercially proven and the dominant technology and therefore it could be hard to convince private players to invest in such a technology.

Category: POLITY AND GOVERNANCE

1. A register in Nagaland

Editorial Analysis:

Currently, the Nagaland government is initiating an exercise to prepare a master list of all indigenous inhabitants of the State.

This list, called the **Register of Indigenous Inhabitants of Nagaland (RIIN)**, is seen as a localised version of the National Register of Citizens (NRC) that Assam began updating four years ago and is scheduled to complete by July 31st, 2019.

What is RIIN? How will it be prepared?

- Civil society groups in Nagaland have often conducted house-to-house surveys for listing non-Naga and IBIs (Illegal Bangladeshi Immigrants).
- The RIIN will be the first official master list of Nagaland's indigenous inhabitants.
- Its objective, as stated in a notification from the Nagaland government, **is to prevent people from acquiring fake indigenous inhabitants' certificates.**
- The list will be based on an extensive survey besides digging into official records of indigenous residents from villages and urban wards.
- The entire process under the supervision of the district administration would be completed within 60 days from the start on July 10, 2019.
- The notification also said designated teams of surveyors would be formed within a week from the date of its publication. These teams would comprise sub-divisional officers, block development officers, school headmasters and other nominated members.
- They would visit every village and ward to make the list.
- Apart from Nagaland's Chief Secretary and Home Commissioner, nodal officers of the rank of a Secretary will monitor the implementation without involvement in the adjudication process.
- The nodal officers are required to submit monthly updates to a permanent committee set up under the Home Department.

What are the steps of this exercise?

- The survey teams have been tasked with noting each family's original residence, current residence and documents such as Aadhar.
- Hard copies of the provisional list thus prepared will be provided to all villages and wards, and published on government websites.

- Claims and objections, which is a page taken from the NRC book, will be entertained till a particular date.
- Based on official records and evidence produced, a district's Deputy Commissioner will adjudicate on the claims and objections from respondents.
- Post-verification, the RIIN will be finalised and hard copies placed in all villages and wards while electronic copies will be stored in the State Data Centre.
- Everyone figuring in RIIN will be issued a barcoded and numbered Indigenous Inhabitant Certificate (IIC).
- The process will be dovetailed with the online system of Inner Line Permit (ILP).
- No IIC will be issued after RIIN is finalised except to babies born to indigenous inhabitants of Nagaland.

What is this permit?

- The ILP is a temporary travel document an Indian citizen has to possess to enter 'protected' areas of the Northeast.
- The Central government issues the ILP under the Bengal Eastern Frontier Regulation, 1873, which restricted the entry of 'British subjects' or Indians into these areas primarily to protect the British interest in tea and oil.
- The restriction continued for 'Citizens of India' after Independence to protect tribal cultures in the northeastern region and to regulate movement to certain areas near the international border.
- Apart from the entire State of Nagaland barring its commercial hub Dimapur, the ILP is applicable in Arunachal Pradesh and Mizoram.

Who is an indigenous inhabitant?

- Nagaland has 16 recognised tribes — Angami, Ao, Chakhesang, Chang, Dimasa Kachari, Khiamniungan, Konyak, Kuki, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Yimchungrü and Zeliang.
- The Kachari and Kuki are non-Naga tribes while the Zeliang comprises two Naga communities — Zeme and Liangmai.
- Entry in RIIN is virtually guaranteed for people belonging to these communities.
- Others such as the Gurkhas living in Nagaland prior to statehood (on December 1, 1963) have been recognised as indigenous.

Issues associated with the definition of 'indigenous inhabitant':

- However, it is important to note that **the definition of 'indigenous inhabitant' has been elusive because of issues beyond the tribal-non-tribal divide.**
- There have been concerns over Nagas from other areas such as Manipur getting jobs by claiming to be indigenous besides IBIs (Illegal Bangladeshi Immigrants) "taking over" large swathes of agricultural lands.

- Another worry is the Naga custom of adopting new communities such as Sumiya – children of Muslim men and Sumi Naga women – who own cultivable land.
- Organisations such as the Naga Students' Federation have called for **accommodating 'Nagas by blood and not by adoption'**.
- Some political parties have asked whether or not the "adopted non-Nagas" will be given indigenous rights.
- A pressure group called the **Joint Committee on Prevention of Illegal Immigrants** sought to end confusion and "prevent inconsistent enumeration" by suggesting December 1, 1963 as the cut-off date for considering people other than the recognised tribes of Nagaland as indigenous inhabitants.

F. Tidbits

Nothing here for today!!!

G. Prelims Facts

Nothing here for today!!!

H. UPSC Prelims Practise Questions

Q1. Consider the following statements:

1. Bhutan is a carbon negative country.
2. 'Druk Yul', which is the local name for Bhutan, means "Land of the Thunder Dragon."
3. Bhutan is the only country in the world to officially measure national happiness. The index is known as GNH (Gross National Happiness).

Which among the above statements is/are correct?
a) 1 and 2 Only
b) 2 and 3 Only
c) All 1, 2 and 3
d) 1 and 3 Only

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Answer: c

Explanation:

- Bhutan is a carbon negative country.
- 'Druk Yul', which is the local name for Bhutan, means "Land of the Thunder Dragon."
- Bhutan is the only country in the world to officially measure national happiness. The index is known as GNH (Gross National Happiness).

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Q2. Consider the following statements:

1. Plasmodium falciparum is a protozoan parasite that causes malaria.
2. The World Malaria Report is published by the International Committee of the Red Cross (ICRC).

Which among the above statements is/are correct?
a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Answer: a

Explanation:

- Plasmodium falciparum is a protozoan parasite that causes malaria.
- The World Malaria Report is published by the World Health Organization (WHO).

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Q3. Consider the following statements:

1. Planets that orbit stars other than our Sun are called exoplanets.
2. The ‘transit method’ of detecting exoplanets looks for dips in the visible light of stars, and requires that planets cross in front of stars along our line of sight to them.

Which of the given statement/s is/are correct?

a. 1 only
b. 2 only
c. Both 1 and 2
d. Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Answer: c

Explanation:

- Planets that orbit stars other than our Sun are called exoplanets.
- The transit method of detecting exoplanets looks for dips in the visible light of stars, and requires that planets cross in front of stars along our line of sight to them.
- Repetitive, periodic dips can reveal a planet or planets orbiting a star.
- Transit photometry, which looks at how much light an object puts out at any given time, can tell researchers a lot about a planet.
- Based on how much of a dip in light a planet causes in its star, one can determine that planet's size.
- Looking at how long it takes a planet to orbit its star, scientists are able to determine the shape of the planet's orbit and how long it takes the planet to circle its sun.

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Q4. Consider the following statements:

1. Persistent organic pollutants (POPs) are organic compounds that are resistant to environmental degradation.
2. POPs bio-magnify throughout the food chain and bio-accumulate in organisms. The highest concentrations of POPs are thus found in organisms at the top of the food chain.

Which of the given statement/s is/are correct?

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Answer: c

Explanation:

- Persistent organic pollutants (POPs) are organic compounds that are resistant to environmental degradation.
- POPs bio-magnify throughout the food chain and bio-accumulate in organisms. The highest concentrations of POPs are thus found in organisms at the top of the food chain.

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I. UPSC Mains Practise Questions

1. The Nagaland government is initiating an exercise to prepare a master list of all indigenous inhabitants of the State. Critically examine this initiative. Would the positives outweigh the negatives? (15 Marks, 250 Words)
2. With warnings from India's top policy-makers and reports of major cities in India struggling to cope with a water crisis, there's talk about exploring technologies to harness fresh water. Critically examine these technologies. How far would they be effective in preventing a water crisis in the future? (15 Marks, 250 Words)