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Mission Surya Nagari

- Union government has launched a scheme for 100% solarisation of Konark sun temple and Konark town in Odisha.
- The scheme will meet all energy requirements of Konark town with solar energy, which is made under PM-vision to develop the historical Sun temple town of Konark in Odisha as 'Surya Nagri'.
- This aims to convey a message of synergy between the modern use of solar energy and the ancient Sun Temple and the importance of promoting solar energy.
- It envisages setting up of the 10-MW grid connected solar project and various solar off-grid applications such as solar trees, solar drinking water kiosks and off-grid solar power plants with battery storage.
- It will receive 100% Central Financial assistance (CFA) support of around Rs. 25 crore through the Ministry of New and Renewable Energy.
- Odisha Renewable Energy Development Agency will be the Implementation Agency of the project (and not union Ministry of Renewable energy or Ministry of culture)

Konark Temple

- Konark was built by King Narasimhadeva I of the Ganga Dynasty (1238-1264AD) in the 13th century and is located in Eastern Odisha near the sacred city of Puri.
- The temple is designed in the shape of a colossal chariot. It is dedicated to the sun God.
- There are two rows of 12 wheels on each side of the Konark sun temple.
- The seven horses are said to symbolize the seven days of the week.
- The temple was used as a navigational point by European sailors. They referred to it as the 'Black Pagoda' due to its dark colour and its magnetic power that drew ships into the shore and caused shipwrecks.
- It is the culmination of Odisha temple architecture.
- It was declared a UNESCO world heritage site in 1984.

Agappe Chitra Magna Kit

- The Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) (National Importance under the Department of Science and Technology (DST) in collaboration with Agappe Diagnostics Ltd. has commercially launched the Agappe Chitra Magna Kit for detection of Covid-19.
- Agappe Chitra Magna is a magnetic nanoparticle-based RiboNucleic Acid (RNA) extraction kit.
- It isolates RNA from the patient sample using magnetic nanoparticles.
- SARS-COV-2, the causative virus of Covid-19 pandemic, is an RNA virus- a long single-stranded polymeric substance present in all living cells that carries the genetic information of the organism necessary for life.
- One of the critical steps in detecting this virus is by confirming the presence of the RNA of the virus in the sample taken from the throat or nose.
- The magnetic nanoparticle beads bind to the viral RNA and, when exposed to a magnetic field, give a highly purified and concentrated RNA.
- As the sensitivity of the detection method is dependent on getting an adequate quantity of viral RNA, this innovation enhances the chances of identifying positive cases.
- The kit can be used for RNA extraction for RT-LAMP, RT-PCR and other isothermal and Polymerase Chain Reaction (PCR) based protocols for the detection of SARS-COV-2.
- The indigenously developed and manufactured RNA extraction kit would reduce the nation’s dependence on imported kits which are expensive and thus will bring down the cost of Covid-19 testing.

RNA

- Ribonucleic acid (RNA) is a polymeric molecule essential in various biological roles in coding, decoding, regulation and expression of genes.
- RNA and DNA are nucleic acids, and, along with lipids, proteins and carbohydrates, constitute the four major macromolecules essential for all known forms of life.
- Like DNA, RNA is assembled as a chain of nucleotides, but unlike DNA, RNA is found in nature as a single strand folded onto itself, rather than a paired double strand.
- Cellular organisms use messenger RNA (mRNA) to convey genetic information (using the nitrogenous bases of guanine, uracil, adenine, and cytosine, denoted by the letters G, U, A, and C) that directs synthesis of

specific proteins.
- Many viruses encode their genetic information using an RNA genome.
- Some RNA molecules play an active role within cells by catalyzing biological reactions, controlling gene expression, or sensing and communicating responses to cellular signals.
- One of these active processes is protein synthesis, a universal function in which RNA molecules direct the synthesis of proteins on ribosomes.
- This process uses transfer RNA (tRNA) molecules to deliver amino acids to the ribosome, where ribosomal RNA (rRNA) then links amino acids together to form coded proteins.

Alternative dwarfing genes in Wheat

- Recently, scientists at Pune based Agharkar Research Institute (ARI), have mapped two alternative dwarfing genes Rht14 and Rht18 in wheat that can help in reducing rice crop residue burning i.e. stubble burning.
- In India, close to twenty-three million tonnes of leftover rice residues are annually burnt by farmers to get rid of the straw and prepare their fields for sowing wheat, which is the next crop, resulting in air pollution.
- Also, dry environments pose a challenge for the germination of wheat varieties with short coleoptile.
- Coleoptile is a sheath which protects the young shoot tip in a grass or cereal, Short coleoptiles are generally less adapted for the deeper sowing conditions.
- The presently available semi-dwarf wheat varieties, which were explored during the Green Revolution, carry conventional Rht1 dwarfing alleles, Alleles are the variant form of a given gene.
- The Reduced Height (Rht) genes decreased plant height and increased productive tillers (sprouts), The present variety produces optimum yields under high-fertility irrigated conditions.
- However, they are not well adapted for deeper sowing conditions in dry environments due to shorter coleoptiles, and low early vigor (measure of increase in plant growth) often results in reduced seedling emergence.
- ARI mapped the dwarfing genes Rht14 and Rht18 on chromosome 6A in a durum variety of wheat, and DNA-based markers were developed for a better selection of these genes in wheat breeding lines.
- The DNA-based markers will help wheat breeders to precisely select wheat lines carrying these alternative dwarfing genes from a massive pool of wheat breeding lines, These genes are associated with better seedling vigour and longer coleoptiles.
- Breeding line is a group of genetically identical homozygous individuals

that, when intercrossed, produce only offspring that are identical to their parents.
- It has been found that dwarfing genes Rht14 and Rht18 in wheat conferred a plant height reduction comparable to the Rht1 alleles while retaining early vigour in wheat seedlings, but do not affect coleoptile length and seedling shoot length.
- Therefore, these can be utilized as an alternative dwarfing genes to Rht1 for deep sowing conditions or in fields with retained stubble.
- The DNA based markers are being used at the Institute for marker-assisted transfer of these genes in Indian wheat varieties, so as to make them suitable for sowing under rice stubble-retained conditions and dry environments.

Technical terms

- **Genetic/DNA marker** is any alteration in a sequence of nucleic acids or other genetic traits that can be readily detected and used to identify individuals, populations, or species or to identify genes involved in inherited disease.
- **Marker-assisted transfer:** It is an indirect selection process where a trait of interest is selected based on a marker (morphological, biochemical or DNA/RNA variation) linked to a trait of interest, e.g. productivity, disease resistance, abiotic stress tolerance, and quality.

Agharkar Research Institute (ARI)

- The Agharkar Research Institute (ARI) is located in Pune, Maharashtra, India.
- Agharkar Research Institute (ARI) is an autonomous, grant-in-aid research institute of the Department of Science and Technology (DST), Government of India.
- It was established in 1946 by the Maharashtra Association for the Cultivation of Science as MACS Research Institute and renamed as ARI in 1992 in honour and memory of its founder Director, late Professor Shankar Purushottam Agharkar.
- It conducts research activities in animal sciences, microbial sciences and plant sciences.

Protocol for Indo-Bangladesh Inland water ways

- People’s Republic of Bangladesh and the Republic of India have a long standing and time-tested Protocol on Transit and Trade through inland

waterways of both countries.

- This Protocol, which was first signed in 1972 (immediately after independence of Bangladesh), is a reflection of shared history and friendship between the two countries.
- It was last renewed in 2015 for five years with a provision for its automatic renewal for a further period of five years giving long term assurance to various stakeholders.
- Recently 2nd Addendum to the Protocol on Inland Water Transit and Trade was signed on protocol for inland water ways between the two nations.
- Under which the number of Indo Bangladesh Protocol (IBP) routes are being increased from 8 to 10 and new locations are also added to the existing routes:
- In Routes (1) & (2) [**Kolkata-Shilghat-Kolkata] as well as in Routes (3) & (4) [Kolkata-Karimganj-Kolkata], Kolaghat** in India has been added.
- Routes (3) & (4) [**Kolkata-Karimganj-Kolkata] and Routes (7) & (8) [Karimganj-Shilghat-Karimganj] have been extended up to Badarpur** in India.
- In these routes, **Ghorasal in Bangladesh** has also been added.
- **Inclusion of Sonamura- Daudkhandi stretch of Gumti river** as IBP route No. 9 & 10 in the Protocol will improve the connectivity of Tripura and adjoining States with Indian and Bangladesh`s economic centres and will help the hinterland of both the countries.
- The operationalization of **Rajshahi-Dhulian-Rajshahi Routes and their extension up to Aricha** will help the augmentation of infrastructure in Bangladesh as it would reduce the transportation cost of stone chips/aggregate to northern part of Bangladesh through this route. It will also decongest the Land Custom Stations on both sides.
- **Inclusion of Jogigopha in India and Bahadurabad in Bangladesh** as new Port of Call will provide connectivity to Meghalaya, Assam and Bhutan.
- Jogigopha also becomes important, since, a Multimodal Logistics Park is proposed to be established there.

[Try to remember the locations in Indian side and Bangladesh side and rivers involved]

Insecticides

- Insecticides are pesticides that are formulated to kill, harm, repel or

mitigate one or more species of insect.

- Insecticides work in different ways. Some insecticides disrupt the nervous system, whereas others may damage their exoskeletons, repel them or control them by some other means.
- Nearly all insecticides have the potential to significantly alter ecosystems; many are toxic to humans and/or animals; some become concentrated as they spread along the food chain.
- Insecticides can be classified into three types:
- **Systemic insecticides** - which have residual or long term activity
- **Contact insecticides** - which have no residual activity.
- Mode of action - describes how the pesticide kills or inactivates a pest, it is important in understanding whether an insecticide will be toxic to unrelated species, such as fish, birds and mammals.
- Insecticides are distinct from non-insecticidal repellents, which repel but do not kill.
- Most widely Insecticides used in India are

1. Endosulfan
2. Phorate
3. Methyl Parathion
4. Monocrotophos
5. Cypermethrin
6. Chlorpyrifos
7. Malathion
8. Quinalphos
9. Dichlorvos

- Union government recently has issued a draft order proposing a ban on import, manufacturing, sale, transport and distribution of 27 insecticides, a move that is likely to impact agro chemicals firms.

Source: The Hindu, PIB

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