

**DAILY
CURRENT
AFFAIRS
ANALYSIS**

 LAKSHYA ACADEMY®

19 SEPTEMBER 2023

1 – About India's falling cotton production:

GS III

Indian Agriculture

- **Context:**

- India's cotton production is decreasing.

- **Key information:**

- When farmers harvest kapas, the raw, un-ginned cotton, only around 36% of it is made up of the white, fluffy fibre, or lint.
- The remainder is made up of seed (62%), trash (2%), and lint that was separated during ginning.
- Conversely, 13% of cotton seed is made up of cooking and frying oil.
- After oil is extracted from the seed and 2% processing losses, the remaining 85% cake provides a protein-rich feed component for cattle and poultry.
- Approximately two thirds of all textile fibres used in India are cotton.
- After mustard and soyabean, cottonseed ranks third among domestically produced vegetable oils and ranks second among feed cakes/meals.

- **Data on production:**

- India increased its lint production of cotton from 140 lakh to 398 lakh bales weighing 170 kg between 2000-01 and 2013-14.
- This was greatly made possible by BT technology.
- Beginning in 2002, farmers in India started to plant genetically altered (GM) cotton hybrids that contained genes taken from the soil bacteria *Bacillus thuringiensis*, or Bt.
- The deadly *Helicoverpa armigera*, also known as the American bollworm insect pest, was made poisoned using the Bt genes.
- Average per-hectare lint yields more than quadrupled from 278 kg in 2000-01 to 566 kg in 2013-14 as the percentage of Bt hybrids in the area of the country cultivated under cotton reached 95%.
- The advantages didn't endure, though.

- **Pink-coloured bollworm:**

- The *Pectinophora gossypiella*, often known as the pink bollworm (PBW), was mostly to blame for the production's decline following the boom.

- The Bt toxins were first intended to offer defence against both the *Helicoverpa* and PBW caterpillars that tunnel into the cotton plant's bolls or fruits, where the lint and seeds are produced.
- However, in Gujarat, an extremely high survival of PBW larvae was found on cotton blooms in 2014.
- Even Punjab, Haryana, and northern Rajasthan saw a major invasion of the bug in 2021.
- **Why the threat of pink bollworm increased:**
- A monophagous pest, cotton is the main food source for PBW.
- *Helicoverpa*, on the other hand, is polyphagous and has a variety of hosts, including tomato, chana (chickpea), lobiya (cowpea), arhar (pigeon pea), jowar (sorghum), and maize.
- The monophagous lifestyle of the PBW larvae allowed them to gradually acquire resistance to Bt proteins.
- Non-Bt cotton production has all but ceased.
- **Getting rid of the pest:**
- The traditional spraying method hasn't been very effective against PBW larvae.
- "Mating disruption" has been used as an alternate strategy.
- In order to draw in male adults, female PBW moths emit the pheromone signalling substance called Gossyplure.
- In this instance, the pheromone is synthesised artificially and added to pipes or lures.
- Therefore, the adult male moths are drawn to the lures and do not mate with females.
- **Moving ahead:**
- Cotton is a crop grown on over 12.5 million hectares, primarily by small farmers, and it plays a big part in India's agriculture and textile industries.
- The development of new dominant pests, particularly PBW, has partly reduced the yield advantages from Bt technology, which gave productivity a significant boost during the first 15 years of this century.
- Farmers in places like Punjab have been deterred from planting cotton by the danger of pest infestation.
- It only serves to emphasise the crucial role that new technologies, like genetically modified organisms (GM), next-generation pesticides, and mating disruption, will have to play in maintaining cotton farming.
- **Source → *The Hindu***

2 – About Ayushman Bhav health scheme:

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Government Policies and Interventions

- **Context:**
- The President of India just launched the Ayushman Bhav campaign.
- **Key information:**
- **The nodal ministry:**
- **Health and Family Welfare Ministry**
- **Aim:**
- launching a comprehensive national healthcare campaign to reach every village and town with healthcare services.
- The campaign represents an all-encompassing national and social strategy.
- It unifies communities, civil society organisations, and government agencies under a single goal: to guarantee that everyone has access to basic healthcare without discrimination or exclusion.
- **Through its three parts, this synergistic strategy intends to include all health services.**
- **Ayushman:**
- 3.0 Apke Dwar.
- Ayushman Melas at Community Health Centres (CHCs) and Health and Wellness Centres (HWCs)
- Ayushman Sabhas in each panchayat and village:
- The goal of the Ayushman Bhav campaign is to establish "Healthy Villages" and "Healthy Gramme Panchayats," building the groundwork for the nation to achieve Universal Health Coverage.
- **Source → The Hindu**

3 – Details of the Global Stocktake Report:

GS II

International Issues

- **Context:**

- A "synthesis report" on the outcomes of the three meetings held thus far to examine the advancement made by nations in fulfilling the objectives of the 2015 Paris Agreement was made public by the United Nations climate secretariat.

- **Why is the report referred to as a "global stocktake"?**

- The synthesis report is part of a broader project called the "global stocktake," which will happen once every five years.
- Countries pledged in Paris in 2015 to limit global temperature increases to "as far as possible" 1.5 degrees Celsius and no more than 2 degrees Celsius by the end of the century.
- They also decided to periodically evaluate or assess the progress done by individual nations in reducing greenhouse gas emissions and switching to renewable energy sources for their fossil fuel-based energy systems.

- **Key conclusions:**

- According to the research, the Paris Agreement has inspired nations to set objectives and emphasise the gravity of the climate challenge.
- States and localities must step up their efforts, and governments must support strategies for moving away from fossil fuel industries.
- Despite the potential for disruption brought on by rapid change, nations should aim to make sure that the economic transition is fair and inclusive.
- According to the report, significantly greater ambition was required to cut global greenhouse gas emissions by 43% by 2030, 60% by 2035, and achieve net zero CO₂ emissions by 2050.
- All "unabated fossil fuels" (such as coal plants without carbon capture and storage devices) must be swiftly phased out, and renewable energy must be built up.
- It is necessary to halt and reverse land deterioration and deforestation.
- It is necessary to promote agricultural practises that are essential for lowering emissions, protecting, and developing carbon sinks.
- Transparent reporting on adaptation could improve comprehension, application, and global cooperation.

- In order to manage risks thoroughly and offer assistance to afflicted populations, urgent action across climate and development policies is needed to prevent, minimise, and address "loss and damage."
- To fulfil pressing and growing requirements, financial flows have to be synchronised with climate-resilient development.
- It was necessary to improve access to climate funding in underdeveloped nations.
- **Conclusion:**
- This paper explicitly acknowledges for the first time the enormous increase in funding required for the global shift to a renewable energy economy.
- The Declaration indicated that poor nations will require USD 5.8 to USD 5.9 trillion in the years before to 2030, as well as USD 4 trillion annually for renewable energy technology by 2030 to achieve net zero by 2050.
- *Source → The Hindu*

4 – About the IISc develops novel approach to detect, kill cancer cells:

GS III

Biotechnology related issues

- **Context:**
- Scientists at the Indian Institute of Science (IISc) have created a novel method that may be used to identify and eradicate cancer cells, particularly those that form solid tumour masses.
- **Key information:**
- The researchers have developed hybrid copper sulphide and gold nanoparticles that can both heat-kill cancer cells and allow for their identification via sound waves.
- **Significance:**
- In the fight against cancer, early detection and treatment are crucial.
- The use of copper sulphide nanoparticles in cancer diagnostics has already attracted interest.
- Gold nanoparticles have demonstrated anticancer properties and can be chemically altered to target cancer cells.

- The IISc team chose to combine these two to create hybrid nanoparticles for the current investigation.
- **How it functions:**
 - These particles have photoacoustic, photothermal, and oxidative stress features.
 - These hybrid nanoparticles absorb light when it is shone onto them, creating heat that can kill cancer cells.
 - Additionally, these nanoparticles emit singlet oxygen atoms, which are harmful to cells.
 - These two methods are intended to be used to kill cancer cells.
- **Cancer diagnosis:**
 - Additionally, the nanoparticles can aid in the cancer diagnosis.
 - Existing techniques like standalone CT and MRI scans need qualified radiology specialists to interpret the images.
 - Once the nanoparticles reach the cancer cells, their photoacoustic ability enables them to absorb light and produce ultrasound vibrations, which can be used to detect cancer cells with high contrast.
 - Since sound waves scatter less through tissues than light does, the ultrasound waves produced by the particles provide a more precise imaging resolution.
 - Better clarity and the ability to quantify the oxygen saturation in the tumour are two additional benefits of using scans made from the generated ultrasonic waves to improve cancer detection.
- *Source → The Hindu*

5 - Shanti Swarup Bhatnagar awards:

GS II

Government Policies and Interventions

- **Context:**
 - The list of recipients of the Shanti Swarup Bhatnagar (SSB) awards for 2022 has been made public by the Council of Scientific and Industrial Research (CSIR) after a delay of almost a year.
- **Regarding the prizes:**

- It is regarded as one of India's most distinguished science awards.
- The 12 scientists who received awards this year are all under the age of 45.
- In honour of the first Director-General (D-G) of the Council of Scientific and Industrial Research (CSIR), the Shanti Swarup Bhatnagar (SSB) Prize was established.

- **Awarded yearly in India by the Council of Scientific and Industrial Research (CSIR) for noteworthy and excellent basic or applied research in:**

- biology
- chemistry
- ecological science
- engineering
- mathematics
- medicine
- physics.
- The award honours excellent scientific and technological accomplishments in India.

- **Qualifications for the prize:**

- any Indian person under the age of 45 who is involved in scientific or technological research.
- People of Indian origin (PIO) and Indian citizens living abroad who are employed in India are also eligible.
- The Prize is given out based on contributions made through work mostly completed in India throughout the five years before to the Prize's year.

- **Regarding CSIR:**

- In 1942, the Council of Scientific and Industrial Research was created as a separate organisation.
- CSIR is one of the largest publicly sponsored R&D organisations in the world.

- **Administrative Structure:**

- President: Ex-Officio Prime Minister
- Vice President: Ex-Officio Minister of Science and Technology

- **Controlling Body:**

- The governing body is led by the Director General.
- The finance secretary (expenditures) serves as the other ex-officio member.
- The periods for other members are three years.

- **Advisory Board for CSIR:**

- a group of 15 members made up of notable figures in their various disciplines of science and technology.
- Its job is to offer the ruling body with S&T inputs.
- Three-year terms apply to members.

- *Source → The Hindu*



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