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Genetically Modified Crops

The Genetic Engineering Appraisal Committee (GEAC) recommended the environmental release of the transgenic hybrid mustard DMH-11 for seed production and conduct of field demonstration studies.

- In crops, genetic modification (GM) involves the **manipulation of DNA** to alter certain characteristics of the crop.
- Soya bean, maize, cotton, and canola are the most widely grown GM crops around the world.
- The common GM characteristics are herbicide tolerance, insect resistance, virus resistance, drought resistance, and fruit and tuber quality.

GM Crops in India

- **Bt cotton** - It is the only GM crop that is allowed in India.
- It has two alien genes from the soil bacterium *Bacillus thuringiensis* (Bt) that allows the crop to develop a protein toxic to the pest pink bollworm.
- **Ht Bt cotton** - It is derived with the insertion of an additional gene, from another soil bacterium.
- This allows the plant to resist the common herbicide glyphosate.
- This GM cash crop is not yet approved in India
- **GM Mustard** - GM hybrid mustard is a product of crossing two plants containing alien '*barnase*' and '*barstar*' genes derived from a soil bacterium.
- This is the first GM food crop that India has permitted for commercial release.
- **Process involved in developing GM crops**

    1. The gene of interest is identified and isolated from the host organism.
    2. It is then incorporated into the DNA of the crop to be grown.
    3. The performance of the GM crop is tested under strict laboratory and field conditions.

Benefits of GM crops	Drawbacks of GM crops

• Better Pest and Disease Resistance. • Greater tolerance of stress, such as drought, low temperatures or salt in the soil. • High yield and faster growth, they can be cultivated and harvested in areas with shorter growing seasons. • Can be made resistant to specific herbicides.	• Can cause Unpredictable side effects. • Can cause ecological damage. • Lead to over use of herbicides. • Not accessible to every poor farmers. • Problem with Intellectual property rights.

Regulatory framework in India for GM crops

- Acts and rules that regulate GM crops in India include:
    1. Environment Protection Act, 1986 (EPA)
    2. Biological Diversity Act, 2002
    3. Plant Quarantine Order, 2003
    4. GM policy under Foreign Trade Policy
    5. Food Safety and Standards Act, 2006
    6. Drugs and Cosmetics Rule (8th Amendment), 1988
- **Genetic Engineering Appraisal Committee** (GEAC) functions in the Union Ministry of Environment, Forest and Climate Change.
- It operates as per the Rules, 1989, under the Environment Protection Act, 1986.
- GEAC is responsible for appraisal of proposals relating to the release of GM organisms and products into the environment.
- It applies to large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.

References

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2. Indian Express - Understanding GM mustard: what is it, and how has it been achieved?
3. The Hindu - Genetic Engineering Appraisal Committee approves commercial cultivation of genetically modified mustard yet again
4. The Hindu Explained - Genetically modified crops and their regulation in India

Ganges River Dolphins

Dolphins have started coming back to the Ganga River with improvement in the quality of its water through the Namami Gange programme.

- Gangetic River dolphin (*Platanista gangetica*) is a **freshwater** aquatic mammal.
- They are **blind** and navigate by emitting ultrasonic sounds.
- It is one of the **South-Asian river dolphins** the other being Indus River dolphin (IUCN - Endangered).

- The Ganges river dolphin is primarily found in the Ganges and Brahmaputra Rivers and their tributaries in India, Bangladesh, and Nepal.
- The Ganges river dolphin has been recognized by the government of India as its National Aquatic Animal in 2009.

Bihar accounts for 50% of the world's river dolphin population.

- **Significance** - Gangetic dolphin is at the top of the food chain and is an indicator of the health of river ecosystems.
- **Threats** – Pollution of the river, bycatch of dolphins (accidental catch in fishing nets)
- **Conservation status**
    1. IUCN status - Endangered
    2. Wildlife Protection Act, 1972 - Schedule I
- **Conservation efforts**
    1. Project Dolphin for conservation of both freshwater (river) and marine (oceanic) dolphins.
    2. National Dolphin Research Centre (NDRC) is being built at Patna, Bihar.
- **Vikramshila Gangetic Dolphin Sanctuary** - The sanctuary is a 60 km stretch of the Ganges River in Bhagalpur District of Bihar.
- Designated in 1991, it is protected area for the endangered Gangetic dolphins in Asia.
- **Dolphin Observatory** - Bihar government is setting up India's first observatory for the mammals in Bhagalpur district at the Vikramshila Gangetic Dolphin Sanctuary (VGDS).
- The observatory is being built on the Sultanganj-Aguwani Ghat Bridge over the Ganga to promote eco-tourism.

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2. World Wild Life – Ganges River Dolphin
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Black Sea Grain Initiative

Russia suspended its participation to the Black Sea grain initiative a deal to allow food exports from Ukraine agreed amidst Russia-Ukraine war.

- The Black Sea Grain Initiative is a deal between Russia, Turkey and Ukraine to export grain and fertilizer from the Ukrainian ports in the Black sea.
- The initiative specifically allows for food exports from 3 key Ukrainian ports in the Black Sea – **Odesa, Chornomorsk and Yuzhny**.
- The UN brokered this initiative among the 3 countries.
- The initiative was agreed in July for 4 months and as it ends Russia decided to opt out of it.

- A Joint Coordination Centre (JCC) was established to monitor implementation.
- It will be hosted in Istanbul and will include representatives from Ukraine, Russia, Turkey and the United Nations.

Ukraine is one of the largest grain exporters in the world. The initiative led to the export of more than 9 million tonnes of grains and other food products out of Ukraine.

Execution

- The UN restores vital food exports from Ukraine.
- Ukrainian vessels guide the cargo ships to international water on the Black Sea avoiding mined area.
- The vessels then safely proceed towards the Bosphorus Strait along an agreed corridor through the Black Sea.
- The ships heading to and from the Ukrainian ports are inspected by teams organised by the JCC.
- **Significance** - Around 25% of shipments are going directly to low and lower income countries including Horn of Africa and Yemen.
- Suspension of the Black Sea Grain initiative is expected to further exacerbate food security, fuel and fertiliser supply challenges faced by the world

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2. The Hindu - U.N. says agreed with Turkey, Ukraine on plan to move 16 vessels under Black Sea grain deal
3. United Nations - Black Sea Grain Initiative - Joint Coordination Centre

Aceclofenac

Indian Veterinary Research Institute (IVRI) has demanded a ban on using aceclofenac in cattle after a new study showed that the drug metabolises into diclofenac in water buffaloes.

Diclofenac, an anti-inflammatory drug, was banned for veterinary use by the Government of India in 2006.

- Aceclofenac is an **anti-inflammatory** and a **pro-drug of diclofenac**.
- It behaves similar to diclofenac in domestic water buffalo as diclofenac does in domestic cattle.
- Diclofenac was found to be the main cause of a dramatic decline (99%) of the vulture population across Asia.

Aceclofenac in water buffaloes poses the same threat to vultures as diclofenac in cattle.

- Aceclofenac caused accidental poisoning in vultures after they fed on carcasses of cattle injected with it.
- Water buffaloes are treated with aceclofenac as painkiller.
- The injected aceclofenac rapidly and almost immediately converts into diclofenac inside the buffalo.
- Aceclofenac has other safe alternatives available like meloxicam and tolfenamic acid.
- Vulture Action Plan 2020-2025 mentions the drug as toxic and asks the Drugs Controller General of India (DGCI) to ban its veterinary use.



References

1. Down To Earth - Ban use of aceclofenac on cattle to save vultures, demands vet researchers

Indian Women Leaders

New Zealand joins Rwanda, Cuba, Nicaragua, Mexico and the United Arab Emirates where at least half the lawmakers are women.

According to the Inter-Parliamentary Union, an international organisation of national parliaments, only 26% of lawmakers globally are women.

- As of October 2022, only 81 out of 542 **(14.9%) MPs in the Lok Sabha** are women, the highest-ever proportion in the country's Parliament.
- There were 24 women MPs in India's first Lok Sabha, which was formed in 1952.
- Though the number of women legislators is relatively low, India has had a long line of female ministers, who paved the way for future generations of women political leaders.
- Early Indian women ministers paved the way for future generations of women political leaders. Few of them are -

Rajkumari Amrit Kaur

- Rajkumari Amrit Kaur was elected from Himachal Pradesh, became the first woman Cabinet minister of Health.
- She was instrumental in establishing the **All-India Institute of Medical Sciences** (AIIMS) and became its first President.
- Her other contributions include

    a. A campaign to eradicate malaria,
    b. Leading the Indian delegation of the WHO for 4 years,
    c. Setting up the Tuberculosis Association and
    d. Being responsible for one of the largest B.C.G. vaccination programmes in the

world.

Tarkeshwari Sinha

- Tarkeshwari Sinha was elected to the first Lok Sabha from Bihar, when she was just 26 years old.
- Sinha became the first female Deputy Finance Minister in the Union cabinet (1958-1964)
- By then, she was already a three-time elected MP of the Lok Sabha.
- During her tenure, campaigns were conducted to popularise the **small savings scheme**, a scheme that still exists.

Vijaya Lakshmi Pandit

- Vijaya Lakshmi Pandit is the sister of Jawaharlal Nehru.
- She was the first Indian woman to become a **minister in pre-Independent India** and assigned the Ministry of local self-government and public health in 1937.
- She was also an elected MP in the first Indian Lok Sabha.

Sushila Nayyar

- Sushila Nayyar is an Indian physician.
- She was the first female Minister of State (Health) in the Union Cabinet (1962-1967).

Indira Gandhi

- Indira Gandhi was the only woman leader in India to become the Prime Minister.
- She was also the first woman Information and Broadcasting Minister.
- She also handled the Ministries of Defence, Home Affairs and External Affairs, among others, while being Prime Minister.

Annie Mascarene

- Activist and lawyer, Annie Mascarene was the **first woman independent candidate** to serve as a Member of Parliament.
- She won from the Travancore-Cochin constituency in Kerala in the 1951 Indian general election.
- She was one of the 15 women who were elected to the Constituent Assembly.

Geeta Mukerjee

- Geeta Mukerjee is a seven-time MP elected from the West Bengal between 1980 and 2000.
- Mukerjee was known as the **Architect of the Women's Reservation Bill** that proposed to provide 33% reservation for women in Parliament and the State Assemblies.

References

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