



## **DAILY CURRENT AFFAIRS 25-06-2024**

### **GS-1**

1. Ghaggar river

### **GS-3**

2. Direct Seeding of Rice (DSR)
3. H5N1
4. First Woman in Space
5. Freshwater Diatom

## Ghaggar river

Syllabus: GS-1; Geography- Mapping

### Context

- Punjab CM Mann reviews flood protection work along Ghaggar river in Sangrur.



### About

- Ghaggar River, river, northern India. The Ghaggar rises in the Siwalik (Shiwalik) Range, in northwestern Himachal Pradesh state and flows about 200 miles (320 km) southwest through Haryana state, where it receives the Saraswati River.
- It eventually dries up in the Great Indian (Thar) Desert.
- Just southwest of Sirsa it feeds two irrigation canals that extend into Rajasthan state.
- The Ghaggar was probably once an affluent of the Indus River.
- Its seasonal flow is dependent on monsoonal (seasonal) rainfall.
- The main tributaries of the Ghaggar are the Kaushalya river, Markanda, Sarsuti, Tangri and Chautang.

### Know more

- Hanumangarh, city, northern Rajasthan state, northwestern India.

- It lies on the right bank of the Ghaggar River about 30 miles (48 km) southeast of Ganganagar.
- Previously called **Bhatner** ("The Fortress of the Bhatti Rajputs"), it became Hanumangarh in 1805 when it was annexed by the princely state of Bikaner.
- The city with its fort was taken by the **Mongol conqueror Timur** (Tamerlane) in 1398. It subsequently changed hands several times.

## **Direct Seeding of Rice (DSR)**

**Syllabus: GS-3: Indian Agriculture – Paddy cultivation.**

**Context:**

- Punjab government **promotes direct seeding of rice (DSR)** to save water.

**Traditional Method Overview:**

- Seeds are **sown in nurseries** and grown for 25-35 days.
- Seedlings are then **uprooted and transplanted** into flooded main fields.
- This method is **labor and water-intensive** but maximizes yields and crop health.



**DSR Process:**

- **Preparation:** Field is laser-leveled and irrigated before seeding.
- **Seeding:** Paddy seeds are directly sown into the prepared field **using a seed drill or lucky seeder**, 20-30 days earlier than traditional transplantation.
- **Seed Treatment:** Seeds are soaked in **fungicide solution for 8 hours**, then dried for half a day before sowing to enhance germination.

#### **Irrigation Schedule:**

- **First Irrigation:** 21 days after sowing.
- **Subsequent Irrigations:** 14-17 more rounds at 7-10 day intervals, adjusted based on soil type and monsoon conditions.
- **Final Irrigation:** 10 days before harvest.
- **Comparison:** Traditional method requires 25-27 irrigations in total, whereas DSR reduces the number needed.

#### **Soil texture and its importance in the context of Direct Seeding of Rice (DSR):**

- **Soil Suitability for DSR:**
- DSR is best suited for **heavy or medium-to-heavy-textured soils**.
- These **soils retain water well**, which is crucial for the success of DSR.
- **Light-textured soils**, with more sand and less clay, do not retain water effectively and are not suitable for DSR.
- **Impact of Unsuitable Soils:**
- Using DSR in light-textured soils **requires frequent irrigation** (every second or third day), negating the water-saving benefits of DSR.
- This results in **higher water consumption** compared to traditional methods.
- **Soil Distribution in Punjab:**
- **Majha and Doaba Regions:** Predominantly have heavy-textured and medium-to-heavy-textured soils, suitable for DSR.
- **Malwa Region:** Contains pockets of heavy-textured, medium-textured, and light-textured soils. Not all parts of Malwa are suitable for DSR.
- **Expert Insight:**
- Dr. M S Bhullar from Punjab Agriculture University emphasizes that only 20% of Punjab's soil is light-textured, indicating limited suitability for DSR in certain areas.

#### **Importance of iron content in soil for Direct Seeding of Rice (DSR):**

- **Iron Content and Suitability for DSR:**  
Soil with sufficient iron content is crucial for **successful DSR implementation**.
- **Severe iron deficiency and weed problems make soil unsuitable for DSR.**  
Even medium-textured soils can be unsuitable if they lack iron, especially if previously used for crops like cotton, maize, or sugarcane.  
Soils with plant-available iron are ideal for DSR.
- **Iron Supplements:**

Farmers should use **ferric iron (green-colored, non-oxidized)** instead of oxidized iron (brown-colored) if iron supplements are necessary.

Lack of iron can **significantly reduce yields** and lead to financial losses.

In some cases, farmers may **need to revert to traditional puddling methods** after initial attempts with DSR on unsuitable soils, losing the labor-saving benefits.

### Path Forward for DSR Adoption:

- **Awareness and Education:** There is a lack of awareness among farmers about soil suitability and management practices for DSR.
- **Training and Support:** Experts recommend comprehensive training programs and accessible helplines to guide farmers from pre-sowing to harvesting, boosting confidence in DSR's effectiveness.
- **Addressing Apprehensions:** Negative experiences due to unsuitable soil or inadequate preparation lead to skepticism among farmers.
- **Word of Mouth Impact:** Negative feedback spreads quickly among farmers, discouraging potential adopters of DSR.

### Advantages of DSR

- **Water Efficiency:** DSR reduces water consumption by 30-50% compared to traditional transplanting methods, crucial for regions with water scarcity.
- **Labor Efficiency:** It significantly reduces the need for labor, as the labor-intensive process of transplanting is eliminated.
- **Time Saving:** Shortens the crop cycle by 7-10 days, allowing farmers to fit in additional crops within a year.
- **Cost Reduction:** Lowers overall cultivation costs by reducing expenses on labor and nursery management.
- **Improved Soil Health:** Promotes better soil structure and reduces methane emissions, contributing to environmental sustainability.

### Challenges of DSR

- **Weed Management:** DSR fields are prone to heavy weed infestation, requiring effective weed control strategies.
- **Pest and Disease Management:** There is an increased risk of pests and diseases in DSR fields.
- **Water Management:** Proper irrigation techniques are critical; over- or under-watering can adversely affect crop yields.
- **Soil Fertility:** DSR might lead to depletion of soil nutrients if not managed properly.
- **Adoption Barriers:** Farmers need proper training and understanding of DSR techniques, which may not be readily available.

### Conclusion:



- **Educating farmers about soil suitability, proper management practices, and providing robust support mechanisms are essential for wider adoption of DSR.**
- **Effective implementation can lead to water savings, reduced labor, and improved crop health, benefiting both farmers and the environment.**

## **H5N1**

**Syllabus: GS-3: General Science –Viral diseases.**

**Context:**

- **HPAI H5N1 strain has affected cattle in multiple U.S. states.**
- **Three cases of human infection in dairy farm workers were reported.**
- **Concerns are rising about potential wider transmission of the virus from cattle to humans.**
- **In Kerala, India, H5N1 outbreaks have occurred in 19 places across Alappuzha, Kottayam, and Pathanamthitta districts.**
- **Large numbers of crows have died in Alappuzha, with confirmed H5N1 virus in their carcasses.**
- **There are fears that the virus could spread extensively due to the ecosystem involving water bodies, migratory birds, fowls, and integrated farms in these districts.**

**The danger posed by H5N1 influenza**

- **Impact on Wildlife and Livestock:** *Since its emergence in 1996, H5N1 has caused extensive deaths among wild birds and domestic fowl, totaling billions of casualties.*
- **Cross-Species Transmission:** *H5N1 has demonstrated the ability to infect around 26 mammalian species, including cattle, and now shows evidence of infecting humans.*
- **Pandemic Potential:** *There is significant concern that H5N1 could trigger a global pandemic due to its ability to infect multiple species and the potential for human-to-human transmission.*
- **Current Situation in the U.S.:** *In the U.S., herd-to-herd transmission of H5N1 has been observed across 12 states, with the virus detected in raw milk and milking machines.*
- **Transmission Risk:** *While the virus currently lacks genetic changes needed for efficient human-to-human transmission, its rapid evolution and widespread geographic presence suggest ongoing vigilance is necessary.*

**Risk to humans from H5N1 influenza:**

- **Transmission from Birds/Animals:** *H5N1 primarily spreads from birds or animals to humans who have close and unprotected contact with them.*

- **Historical Human Cases:** *Between 2003 and April 1, 2024, close to 900 human infections of H5N1 have been reported globally across 23 countries. More than half of these cases were fatal.*
- **Perceived Risk:** *Currently, the risk of human infections from H5N1 is considered low. However, this assessment can change rapidly if the virus spreads to more animals, especially those like cows or domestic mice that have closer contact with humans.*
- **Local Factors:** *In districts such as Alappuzha, where water fowls, chickens, dairy cows, and humans share the same environment, the risk of human infections is perceived to be higher due to increased opportunities for exposure.*

### **The symptoms of H5N1 influenza:**

- **Common Symptoms:** *Similar to other types of influenza A, symptoms include respiratory difficulties, fever, cough, sore throat, and pneumonia. These symptoms can be severe, especially in individuals who are immunocompromised or have underlying health conditions.*
- **Additional Symptom:** *In some cases, conjunctivitis (pink eye) has been reported as a symptom. This was noted in at least one farm worker infected in the U.S.*
- **Health Advisory:** *The CDC has issued advisories for clinicians to consider H5N1 infection in individuals presenting with respiratory illness or conjunctivitis, particularly if they have had exposure to livestock or dead birds.*
- **Early Detection:** *Early detection and containment are crucial to prevent the spread of the virus. Prompt identification of cases among humans and animals is essential for effective containment measures.*
- **Containment Strategies:** *In affected areas like Kerala, India, containment strategies involve mass culling of birds within specific radii of reported infections. Continuous surveillance through testing environmental samples (water, bird fecal matter) and human samples with influenza-like illness is ongoing.*
- **Preventive Measures:** *People in affected areas are advised to wear masks, and prophylactic treatment with antiviral medications like Tamiflu is recommended for individuals in contact with H5N1-positive cases.*

### **H5N1 influenza transmission**

- **Avoid Exposure:** *People should avoid unprotected contact with infected birds or animals, as well as their contaminated environments.*
- **Monitor Symptoms:** *Anyone exposed to a potentially contaminated environment should monitor themselves for new respiratory illness symptoms, including conjunctivitis, for 10 days. Seeking medical advice promptly is crucial if symptoms develop.*
- **Safe Food Handling:** *Consume only pasteurized milk and ensure poultry meat and eggs are thoroughly cooked to prevent potential food-borne transmission of H5N1.*
- **Public Health Coordination:** *The Lancet emphasizes the importance of a robust and coordinated response to H5N1, advocating for the operationalization of the 'One*

*Health' concept. This approach integrates human, animal, and environmental health to effectively manage infectious diseases.*

- **Implementation in Kerala:** Kerala has operationalized the 'One Health' approach as part of the World Bank-aided 'Rebuild Kerala' project. This includes a community-based disease surveillance network across four districts, with volunteers trained to report any unusual animal or bird deaths. Early reporting enables swift implementation of preventive and control measures.

## **First Woman in Space**

**Syllabus: GS-3: Science and Technology – Space Race.**

**Context:**

- *The world is celebrating the anniversary of the historic day when the first woman flew to space.*
- *Soviet Union's Valentina Tereshkova became the first female cosmonaut when she launched on June 16, 1963.*

**US-USSR Rivalry During the Cold War:**

- **Cold War Context:** *The rivalry between the US and USSR was a part of the Cold War, a period of political tension and competition between the two superpowers following World War II.*
- **Space Race:** *A significant aspect of this rivalry was the Space Race, where both nations aimed to demonstrate their technological and scientific superiority by achieving major milestones in space exploration.*
- **Key Milestones:**
  - **Sputnik:** *The USSR launched Sputnik, the first artificial satellite, in 1957, marking the beginning of the Space Race.*
  - **Yuri Gagarin:** *In 1961, Yuri Gagarin became the first human to orbit Earth, giving the USSR a significant lead.*

**Valentina Tereshkova's Selection:**

- **Soviet Goals:** *After Gagarin's flight, the USSR aimed to achieve another first by sending a woman into space, further solidifying its dominance in the Space Race.*



➤ **Tereshkova's Background:**

- **Parachuting:** *Valentina Tereshkova was an **amateur skydiver**, which made her a strong candidate.*
- **Political Symbol:** *As a factory worker and daughter of a war hero, she represented the **ideal Soviet citizen**, embodying the values of the working class and loyalty to the state.*

**Tereshkova's Mission:**

- **Vostok 6:** *On June 16, 1963, Valentina Tereshkova flew aboard Vostok 6, becoming the first woman in space.*
- **Impact:**
  - **International Recognition:** *Her mission was celebrated worldwide, making her an iconic figure in space exploration.*
  - **Soviet Prestige:** *Her flight was a major propaganda victory for the USSR, showcasing their **commitment to gender equality** and technological prowess.*

**Context of the Space Race:**

- **Post-WWII Rivalry:** *After World War II, the USA and USSR emerged as the two dominant global powers, leading to a period known as the Cold War.*
- **Cold War Characteristics:**
  - **Non-Military Competition:** *Both nations sought dominance through **various non-military means** to avoid direct conflict, particularly due to the threat of nuclear weapons.*
  - **Term "Cold War":** *Coined by British **author George Orwell**, referring to a tense, indirect conflict where nations feared nuclear devastation.*
- **Space Race:**
  - **Beginning:** *Started in 1955, the Space Race was a key aspect of the Cold War, with both nations striving to achieve significant milestones in space exploration.*
  - **Key Achievements:**
    - **First Satellite:** *USSR launched Sputnik, **the first artificial satellite**, in 1957.*

- **First Human in Space:** *Yuri Gagarin of the USSR orbited Earth in 1961.*
- **Strategic Importance:** *Successes in space were seen as **crucial for national security and technological superiority.***

#### **Early Life:**

- **Birth:** *Valentina Tereshkova was born in 1937 in a small village in Russia.*
- **Background:** *Her father was a farmer-turned-army-sergeant.*

#### **Path to Space:**

- **Training:** *Tereshkova trained as a parachutist and skydiver, skills needed for the Soviet space missions.*
- **Selection:** *In 1962, she was one of five women chosen for astronaut training by the Soviet Union.*

#### **Historic Flight:**

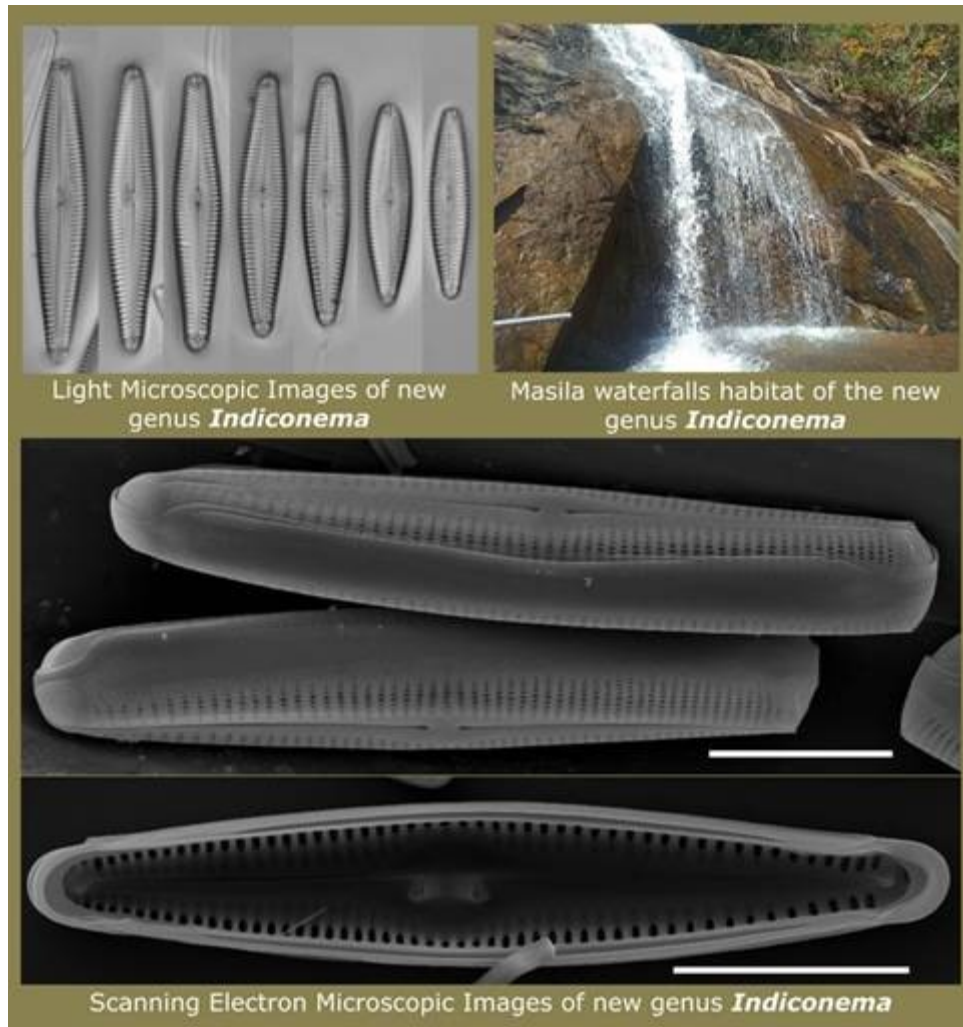
- **Mission:** *Tereshkova piloted the Vostok 6 on June 16, 1963, **orbiting Earth 48 times in 71 hours.***
- **Significance:** *She became the **youngest woman to fly to space** and the **only woman to make a solo space journey.***

## **Freshwater Diatom**

### **Syllabus:GS-3; Environment and Ecology**

#### **Context**

- *Researchers from **the Agharkar Research Institute (ARI)** in Pune have discovered a new genus of diatoms in the unpolluted waters of the Eastern Ghats mountain range.*



### What are Diatoms?

- Diatoms are **microscopic algae** that play a crucial role in our everyday lives, producing approximately 25 percent of the global oxygen supply— roughly every fourth breath we take.
- They form the base of the aquatic food chain and serve as valuable indicators of water quality due to their sensitivity to changes in water chemistry.

### More to know

- The genus has been named "**Indiconema**" due to its limited distribution within the country.
- The research, published in the journal *Phycologia*, reports one species of *Indiconema* from the Eastern Ghats and another from the Western Ghats, highlighting the diverse biogeographic zones that support various diatom species in India.

- *India boasts a rich diatom diversity, with an estimated 6,500 taxa, of which 30 percent are endemic (restricted to a particular region), suggesting the country's unique biodiversity.*
- *The diverse biogeographic zones, ranging from freshwater to marine environments, sea level to high mountains, and alkaline lakes to acidic swamps, support a wide array of habitats and unique sets of diatoms.*
- *The evolution of monsoons has played a significant role in structuring the rainforest biome across the Indian Peninsula, directly shaping the diatom flora.*
- *The study's findings suggest that Indiconema is closely related to Afrocybella, a genus endemic to East Africa, further emphasizing the biogeographical connections between India and the African continent.*