



Conserving Northern White Rhino Through Surrogacy

For Prelims: [Northern White Rhino](#), [in-vitro fertilization \(IVF\)](#), [Surrogacy](#), [Indian rhinoceros](#)

For Mains: Surrogacy Associated Challenges, Role of Biotechnology in the Conservation of Extinct species

Source: [IE](#)

Why in News?

The [northern white rhino \(NWR\)](#) is one of the most endangered animals on the planet, **with only two females left alive**. In a bid to rescue this species, scientists embarked on an ambitious project named **BioRescue in 2015**, employing reproductive technologies like [in-vitro fertilization \(IVF\)](#) and **stem cell techniques**.

- Recently, the international consortium, BioRescue, announced the **first-ever rhino pregnancy** through a lab-made embryo transferred to a **southern white rhino**.
- This endeavour represents a beacon of hope for the survival of the northern white rhino.

How are Scientists Creating Test Tube Rhinos?

- **In-Vitro Fertilization (IVF) Breakthrough:**
 - BioRescue, an international consortium of scientists, achieved a historic milestone with the **first-ever rhino pregnancy through IVF**.
 - The process involved **transferring a lab-made rhino embryo into a surrogate southern white rhino**.
- **Surrogacy:**
 - The **death of the last male northern white rhino in 2018** made surrogacy the only viable option for species regeneration.
 - The remaining two females, Najin and Fatu, were found incapable of reproduction for pathological reasons.
 - The **only hope** for the NWR is to use frozen sperm from deceased males and eggs from the females to create embryos in the laboratory, and then implant them into **surrogate mothers from the southern white rhino (SWR)** subspecies, which is more abundant and genetically similar.
- **Concerns Regarding the Test Tube Rhinos:**
 - **Genetic Viability Concerns:**
 - Embryos used in the process are **derived from eggs of two females and sperm from deceased males**, limiting the **gene pool** for a viable northern white population.
 - **Preserving Northern White Rhino Traits:**
 - Crossbreeding with southern white rhinos is not a solution, as it would result in the loss of unique attributes of the northern white, adapted for swampy habitats.
 - Genetic diversity remains a concern even with successful IVF and surrogacy attempts.

- **Behavioral Challenges in IVF Offspring:**
 - Babies born through IVF are not genetically hardwired to exhibit **typical northern white rhino behaviours**.
 - Early interaction and learning from northern white adults are crucial for maintaining species-specific traits.
 - The urgency lies in the **age of the remaining northern white females**, Najin (35) and Fatu (24).
 - To ensure behavioral and social skills are passed on, the first **IVF calves must be born in time to learn** from the surviving females.
- **Conservation Beyond Test Tubes:**
 - Critics argue that the focus should not only be on species regeneration but also on addressing the root causes of extinction, **such as habitat threats and poaching**.

Surrogacy:

- It is an arrangement in which a **woman (the surrogate) agrees to carry and give birth to a child** on behalf of another person or couple (the intended parent/s).
 - A surrogate, sometimes also called a **gestational carrier**, is a woman who conceives, carries and gives birth to a child for another person or couple (intended parents).

What are the Key Facts Regarding the Northern White Rhino?

- **About:**
 - The **NWR is a subspecies of the white rhino** (*Ceratotherium simum*), which is native to central and eastern Africa.
 - White rhinos are the second largest land mammal after the elephant. They are known as the **square-lipped rhinoceros**, white rhinos have a square upper lip with almost no hair.
 - The **northern and southern white rhino are two genetically distinct subspecies** of the white rhino.



- **Current Status:**
 - The **[IUCN Red List Status](#)** of White Rhino is Near Threatened. The IUCN status of its subspecies is as follows:
 - Northern White Rhino: **Critically Endangered**.
 - Southern White Rhino: **Near Threatened**.

- The NWR population has declined dramatically due to **poaching, habitat loss, civil war, and disease**.
 - In the 1960s, there were about 2,000 NWRs in the wild. By 2008, only four remained.
 - The last male NWR, named Sudan, died in 2018, leaving only **two females, Najin and Fatu**, who live in a conservancy in Kenya.
- The majority (98.8%) of the southern white rhinos occur in just four countries: South Africa, Namibia, Zimbabwe, and Kenya.
- Southern white rhinos are around 18,000 animals that exist in protected areas and private game reserves.

Note

- The [Indian rhinoceros](#) (also known as the greater one-horned rhinoceros) is different from the African rhinos and it is listed as **vulnerable on the IUCN Red List**.

UPSC Civil Services Examination, Previous Year Question

Prelims

Q. In the context of recent advances in human reproductive technology, “Pronuclear Transfer” is used for (2020)

- (a) fertilization of egg in vitro by the donor sperm
- (b) genetic modification of sperm producing cells
- (c) development of stem cells into functional embryos
- (d) prevention of mitochondrial diseases in offspring

Ans: (d)